

COMPUTER INFO-GALLERY

VOLUME - 8

(2019-2020)



Students' Assignments as

IT Encyclopedia

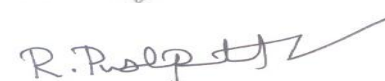
PREFACE

This book is intended to make the New-Comers (Students) of the Department of Computer Science (UG), who does not have the ideas regarding the basics of the Computer and its terminologies. It can also help the students from computer backdrop, to make a review regarding the IT terminologies and concepts. Already 7 Volumes has been launched during 2012-2019.

The thought of publishing this book arises as a sparkle to make the Student's Assignments, in an organized manner. We have an idea that, if the topics given to the students to prepare their Assignments are non-repetitive, then they may do the task without copying others' content. Then, we thought why it shouldn't be combined together in the form of a book, which will help other students also. That is how this book got emerged. This is the 8th Volume for the academic year 2019-2020 with some other useful contents to make the students very well equipped in the foundation level especially for the students who come into the area of Autonomous.

The copy of this book will be maintained in the Department Library and also the e-content of this book has been posted in our college website. We hereby deliver our heartfelt thanks to the most honorable Correspondent Sir, the respected Principal Sir, and the beloved H.O.D. (CS) Prof. P.Ramesh Sir, who gave us the freedom, to conduct an activity of this kind. We sincerely thank our beloved faculty members who have given a moral support. We also thank our dear students for their co-operation. We hereby assure that the Department of Computer Science (UG) will always find ways for the betterment of the Students.

Thanking You,



INFO-GALLERY IN-CHARGES

1.Mr.S.JAGANATHAN

2.Dr.R.PUSHPALATHA

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BEST WISHES

To all your present and future innovations for the betterment of our students and the Institution...

H.O.D

Principal

Correspondent

Assignment Contributions

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UNDER THE GUIDANCE OF: Mr.D.GOPINATH

STUDENT VOLUNTEERS: 1. Mr. S. CHRIST OLIVER LLOYD - II B.Sc (CS) - 'A'

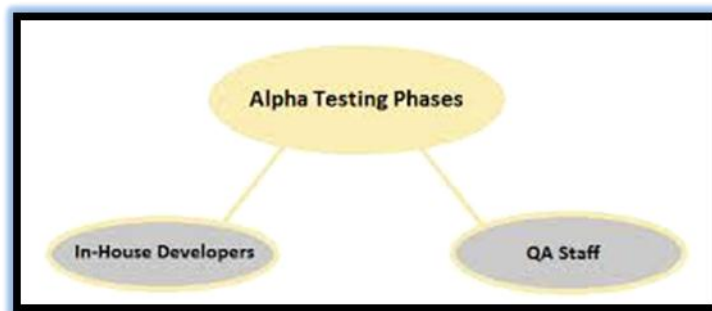
2. Mr. C. PRASANTH - II B.Sc (CS) - 'B'

1. ALPHA TEST

Alpha Testing is defined as a type of software testing, performed to identify bugs before releasing the product to real users or the public. It is a type of acceptance testing. The focus of this testing is to simulate real users by using Blackbox and Whitebox techniques. The aim is to carry out the tasks that a typical user might perform. This kind of testing is called alpha only because it is done early on, near the end of the development of the software, and before beta testing.



Who is involved in Alpha testing?



How to do Alpha Testing

- Review the design specification and functional requirements
- Develop comprehensive test cases and test plan
- Execute test plan
- Log defects
- Retest once the issues have been fixed.

Alpha Testing Process Example

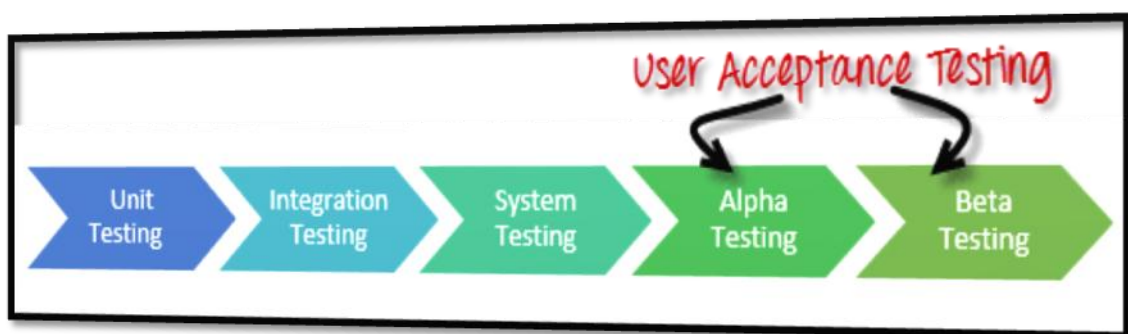
Usually, an alpha testing takes place in the test lab environment on a separate system. In this technique, project manager teams up with the developer to define specific goals for alpha testing, and to integrate the results into evolving project plans. As such alpha testing is done on a prototype, in-depth reliability testing, installation testing, and documentation testing can be ignored.



Advantages & Disadvantages of Alpha testing

- ❖ The only advantage is that – for a small system this will be ideal integration testing technique.
- ❖ The disadvantages are that – you would have to wait for all the modules to be integrated, so there will be quite a lot of delay.
Errors are identified at a very late stage and it is very hard to identify the faults.

Difference between Alpha testing & Beta testing



2. ALURIA SOFTWARE

Aluria is a software which is a leading provider of computer security. It was founded in the year 1998. Currently, Earthlink is the parent organization of Aluria. It acquired the assets of the company in the year 2005 for a disclosed price.



Earthlink – the parent:

EarthLink is an American Internet service provider. EarthLink was formed in 1994. As of November 2016, it was promoting two service groups: Residential Solutions and Business Solutions. EarthLink went public on NASDAQ in January 1997. Later that year, the company began to provide 56K dial-up access, doubling the speed of its dial-up service.

Why ALURIA software?

Aluria software provides its users the following features:

Firewall :

Firewalls guard the ports that your computer uses to access the internet and makes sure that only the ports that need to be used are being used. If malware is attempting to use an unauthorized port, it blocks it and prevents it from being downloaded onto your computer.

Parental control :

This is excellent for people with kids as it helps you block access to various websites. By blocking sites that are unsuitable for children or that contain a lot of malware, you can protect not only your children but also your computer.

Privacy filter :

Privacy filters are designed to let you know when you're about to provide personal information to a website. This allows you to take a moment and check if the website you're using is legitimate or a phishing site that has bad intentions for your information.



File Backup :

Backing up your data is an important part of protecting yourself from malware attacks. This way, if an attack does happen, your files will be safe. During a severe virus attack, you may need to wipe your computer clean so having file backup will ensure that you don't lose any information.

IM Protection :

This protects you against malware that may be delivered during instant messages, so it's great to have if you frequently use any instant messaging programs or websites to talk with people.

3. UBUNTU OPERATING SYSTEM

History:

UBUNTU is built on “DEBIANS” architecture and infrastructure and comprises Linux server desktop and discontinued phone tablet operating system versions. Ubuntu releases updated versions predictably every six months and each release receive free support for nine months with security fixes, high impact bug fixes and conservative, substantially beneficial low-risk bug fixes.



Ubuntu today:

Ubuntu is currently funded by Canonical Ltd. On 8 July 2005, Mark Shuttleworth and Canonical announced the creation of the ubuntu foundation and provided an initial funding of US\$10 million. The purpose of the foundation is to ensure the support and development for all future versions of Ubuntu. Mark Shuttleworth describes the foundation goals as to ensure the continuity of the Ubuntu Project.

Features:

A default installation of ubuntu contains a wide range of software that includes:

- ✓ Firefox
- ✓ Libre Office
- ✓ ThunderbirdTransmission etc.

Various types of ubuntu software:

Kubuntu



Ubuntukylin



Lubuntu



UbuntuBudgie



Ubuntu badge

Ubuntu operates under the GNU General Public License (GPL) and all of the application software installed by default is free software. In addition, Ubuntu installs some hardware drivers that are available only in binary format, but such packages are clearly marked in the restricted component.

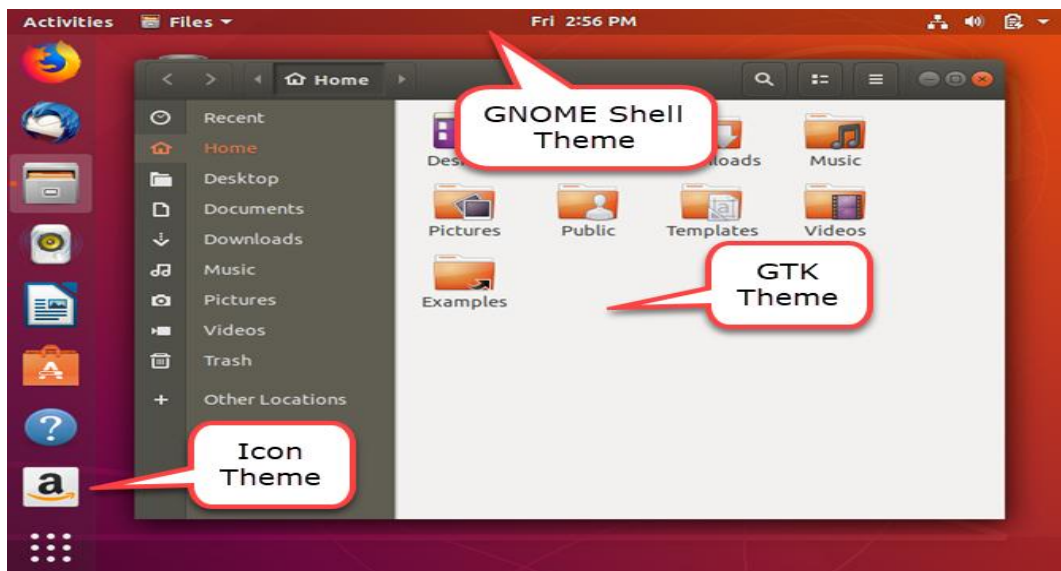
Security:

Ubuntu aims to be secure by default. User programs run with low privileges and cannot corrupt the operating system or other user files. For increased security the SUDO tool is used to assign temporary privileges for performing administrative tasks, which allows the root account to remain locked and helps prevent inexperienced users from inadvertently making catastrophic system changes or opening security holes. POLKIT is also being widely implemented into the desktop.



Installation:

The system requirements vary among Ubuntu products. For the Ubuntu desktop release 16.04 LTS, a PC with at least 2GHz dual core processor, 2GB of Ram and 25GB of free disk space is recommended. For less powerful computers, there are other ubuntu distributions such as Lubuntu and Xubuntu. Ubuntu supports the ARM architecture.



It is also available on Power ISA, while older PowerPC architecture was at one point unofficially supported, and now Power ISA CPUs (POWER8) are supported.

4. APACHE TOMCAT

Introduction:

Apache Tomcat (also referred to as Tomcat Server) implements several Java EE specifications including Java Servlet, JavaServer Pages(JSP), Java EL, and WebSocket, and provides a "pure Java" HTTP web server environment in which Java code can run.

Tomcat is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation, released under the Apache License 2.0 license, and is open-source software.

Catalina:

Catalina is Tomcat's servlet container. Catalina implements Sun Microsystems's specifications for servlet and JavaServer Pages (JSP). In Tomcat, a Realm element represents a "database" of usernames, passwords, and roles (similar to Unix groups) assigned to those users. Different implementations of Realm allow Catalina to be integrated into environments where such authentication information is already being created and maintained, and then use that information to implement Container Managed Security as described in the Servlet Specification.

Coyote:

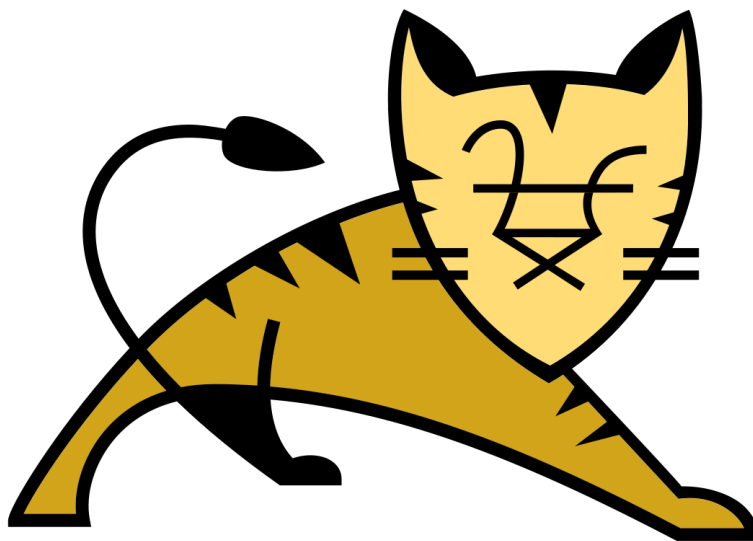
Coyote is a Connector component for Tomcat that supports the HTTP 1.1 protocol as a web server. This allows Catalina, nominally a Java Servlet or JSP container, to also act as a plain web server that serves local files as HTTP documents. Coyote listens for incoming connections to the server on a specific TCP port and forwards the request to the Tomcat Engine to process the request and send back a response to the requesting client. Another Coyote Connector, Coyote JK, listens similarly but instead forwards its requests to another web server, such as Apache, using the JK protocol. This usually offers better performance.

Cluster:

This component has been added to manage large applications. It is used for load balancing that can be achieved through many techniques. Clustering support currently requires the JDK version 1.5 or higher.

JASPER:

- JSP Tag library pooling - Each tag markup in JSP file is handled by a tag handler class. Tag handler class objects can be pooled and reused in the whole JSP servlet.
- Background JSP compilation - While recompiling modified JSP Java code, the older version is still available for server requests. The older JSP servlet is deleted once the new JSP servlet has finished being recompiled.
- Recompile JSP when included page changes - Pages can be inserted and included into a JSP at runtime. The JSP will not only be recompiled with JSP file changes but also with included page changes.
- JDT Java compiler - Jasper 2 can use the Eclipse JDT (Java Development Tools) Java compiler instead of Ant and java.



Apache tomee:

Apache TomEE (pronounced "Tommy") is the Java Enterprise Edition of Apache Tomcat (Tomcat + Java EE = TomEE) that combines several Java enterprise projects including Apache OpenEJB, Apache OpenWebBeans, Apache OpenJPA, Apache MyFaces and others. Given a certification by Oracle Corporation as a compatible implementation of the Java EE 6 Web Profile.

5. APPLE SCRIPT

About apple script:

Apple script is a scripting language created by Apple Inc. that facilitates automated control over scriptable Mac application. First introduced in system 7, it is currently included in all versions of macOS as a part of a package of system automation tools. The term “Apple Script” may refer to the language itself, to an individual script written in the language, or, informally, to the macOS Open Scripting Architecture that underlies the language.

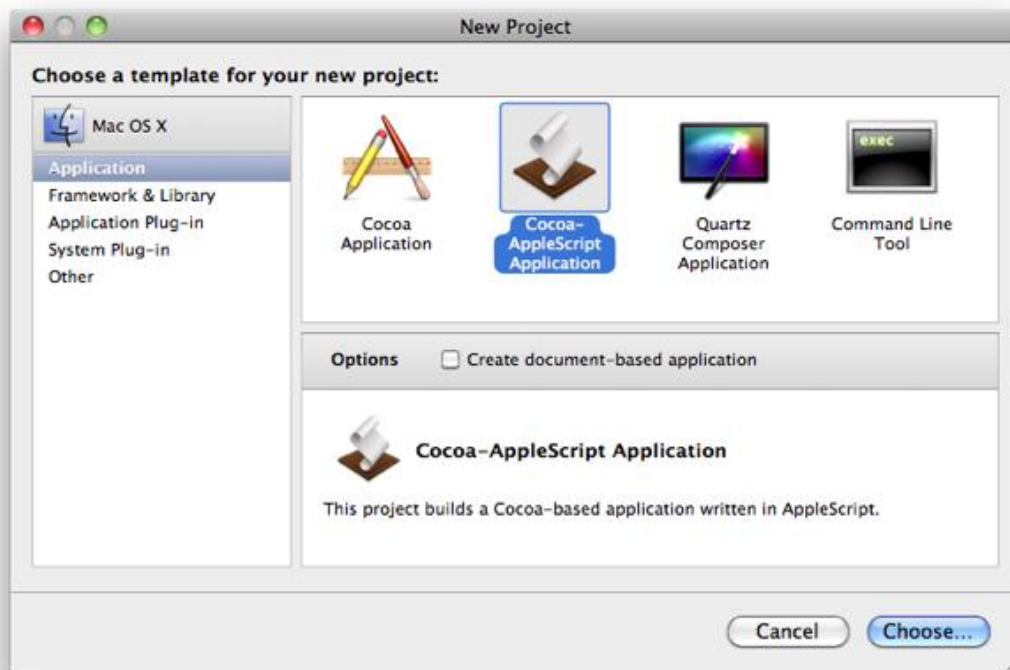


History:

In the late 1980s Apple considered using HyperCard’s HyperTalk scripting language as the standard language for end-user development across the company and within its Mac OS operating system, and for interprocess communication between Apple and non-Apple products. HyperTalk could be used by novices to program a HyperCard stack. Apple engineers recognized the a similar, but more object oriented scripting language could be designed to be used with any application, and the Apple Script project was born as a spin-off of a research effort to modernize the Macintosh as a whole and finally become part of system.

Apple script was released in October 1993 as part of system 7.7.1(system 7 pro, the first major upgrade to system 7).QuarkXPress (ver.3.2) was one of the first major software applications that supported AppleScript. This is turn led to AppleScript being widely adopted within the publishing and prepress, even after QuarkXPress and other publishing application were ported to Microsoft Windows.

After some uncertainty about the future of apple Script on apple's next generation OS, the move to Mac OS (around 2002) and its Cocoa frameworks greatly increased the usefulness and flexibility of apple script.



- ❖ In AppleScript, the traditional "Hello, World!" program could be written in many different forms:
 - display dialog "Hello, world!" -- a modal window with "OK" and "Cancel" buttons
- or
- ❖ display alert "Hello, world!" -- a modal window with a single "OK" button and an icon representing the app displaying the alert
- or
- ❖ say "Hello, world!" -- an audio message using a synthesized computer voice.

6. AR SYSTEM

Definition:

AR is a “live direct or indirect view of a physical, real world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video or GPS data.” Some systems even produce appropriate smell. The augmented data is generated in real time and “within semantic context.” The goal is to amplify the viewer’s perception or sensory experience. But, virtual reality replaces the real world with a simulated one, and mediated reality often diminishes sensory detail.



Working of AR:

The concept is complex, but usually AR devices use computers, displays, sensor components and devices that can input the information, such as cameras. These things are available on smart phones and make the phones good channels for AR applications such as Snap chat. The information gleaned through the GPS or cameras, or through other sensory devices, is evaluated and superimposed over the real-world view.

State listing of computer science degree programs:

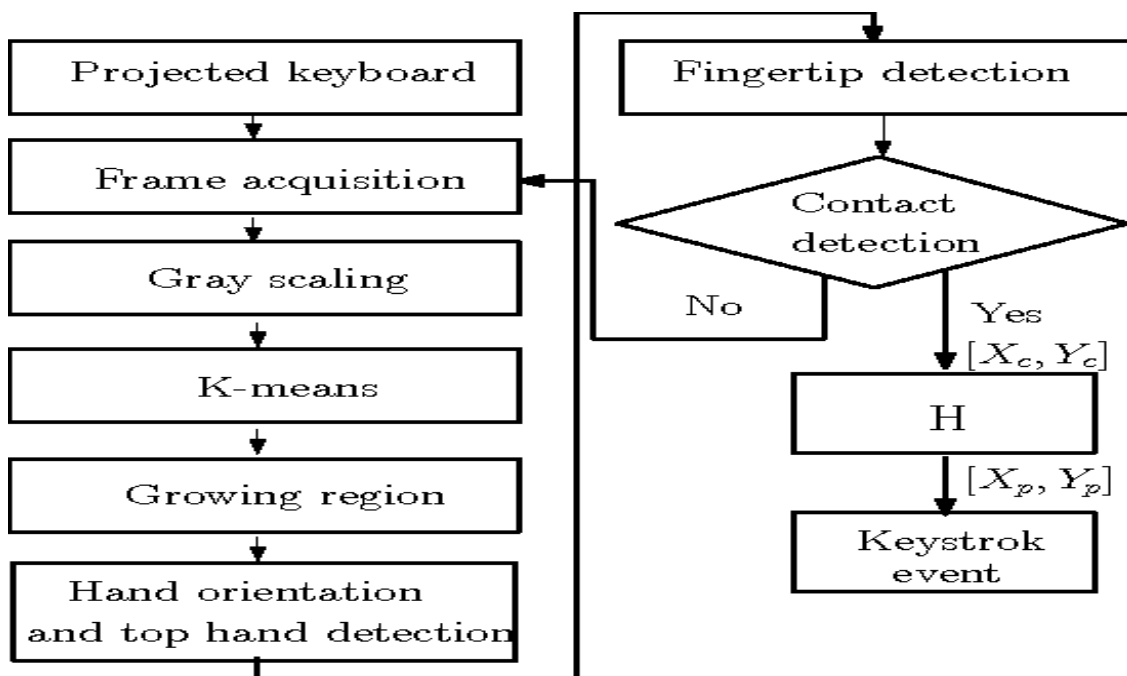
Many different systems are used to produce AR. Head-mounted displays, for instance, are worn in a helmet or harness. They place virtual elements over the real world view of the wearer as he changes his field of vision. Time may be seemingly displayed in “thin air” as the user looks ahead. As the viewer looks at a historical building, its history may appear, or be broadcast over earphones.

There are eyeglasses that show the route to a destination as the wearer walks. Developers are even working on contact lenses that will provide AR.

Future uses of AR:

The product already in existence that allows users to make mobile phone calls without removing the phones from their pockets. The device projects a phone dial pad onto the user’s palm so that he can “dial” the number using special colored caps on his fingers. The product is called “Sixth Sense” and employs a smart phone, cameras, a small projector and a mirror. The colored finger caps that are used to manipulate the projected images can be replaced by specially-colored fingernail polish. “Sixth Sense” turns any surface, even a person, into a projection screen. The device has multiple practical uses. Someone grocery shopping may look at a can of soup, and the nutrition data, cost and even customer reviews will appear superimposed over the image.

Products are being developed that will enable a job-seeker to point his device, such as his smart phone, at a business and the application will tell him if the company is hiring. AR even has military uses. It is already assisting soldiers to locate routes as they travel through unfamiliar countryside.



7. ARDOUR

Definition:

Ardour is a hard disk recorder and digital audio workstation application that runs on Linux, macOS, FreeBSD and Microsoft Windows. Its primary author is Paul Davis, who is also responsible for the JACK Audio Connection Kit. Ardour is intended to be digital audio workstation software suitable for professional use. Released under the terms of the GNU General Public License (version two or any later version), Ardour is free software. Ardour major version 5.0, with improvements including support for a new tabbed interface, Lua scripting, VCAs, plugin pin management and many other new features, was released in August 2016.



Recording:

Ardour's recording abilities are limited by only the hardware it is run on; there are no built-in limits in the software. When recording on top of existing material, Ardour can do latency compensation, positioning the recorded material where it was intended to be when recording it, g. JACK Audio Connection Kit. Self-monitoring makes it possible to apply plug-in effects to the signal while recording in real-time. Using the audio server JACK, Ardour can record both from the audio card and compatible software concurrently.

Mixing:

Ardour supports an arbitrary number of tracks and buses through an "anything to anywhere" routing system. All gain, panning and plug-in parameters can be automated. All sample data is mixed and maintained internally in 32-bit floating point format.

Editing:

Ardour supports dragging, trimming, splitting and time-stretching recorded regions with sample-level resolution and has a possibility to layer regions. It includes a crossfade editor and beat detection. Ardour has unlimited undo/redo and a snapshot feature for storing the current state of a session to a file for future reference.

Mastering:

Ardour can be used as an audio mastering environment. Its integration with the JACK Audio Connection Kit makes it possible to use mastering tools such as JAMin to process the audio data. The output of Ardour's mixer can be sent to JAMin and/or other audio-processing software to be processed and/or recorded.



Compatibility:

Ardour attempts to adhere to industry standards, such as SMPTE/MTC, Broadcast Wave Format, MIDI Machine Control and XML. Ardour has been tested on GNU/Linux, on the x86-64, x86, PowerPC and ARM (for at least version 3) architectures, Solaris, macOS on Intel and PowerPC, Windows on Intel architectures and FreeBSD. It takes advantage of multiprocessor and multicore SMP and real-time features of these operating systems. Support is limited on operating systems other than Linux and macOS.

8. AUTOCAD

AutoCAD is a commercial computer-aided design (CAD) and drafting software application. It was developed and marketed by Autodesk. AutoCAD was first released in December 1982 as a desktop app running on microcomputers with internal graphics controllers. Before AutoCAD was introduced, most commercial CAD programs ran on mainframe computers or minicomputers, with each CAD operator (user) working at a separate graphics terminal. Since 2010, AutoCAD was released as a mobile- and web app as well, marketed as AutoCAD 360.



History:

AutoCAD was derived from a program that began in 1977, and then released in 1979 called Interact CAD also referred to in early Autodesk documents as MicroCAD, which was written prior to Autodesk's (then Marinchip Software Partners) formation by Autodesk cofounder Michael Riddle. The first version by Autodesk was demonstrated at the 1982 Comdex and released that December. AutoCAD supported CP/M-80 computers. As Autodesk's flagship product, by March 1986 AutoCAD had become the most ubiquitous CAD program worldwide. The 2020 release marked the 34th major release of AutoCAD for Windows. The 2019 release marked the ninth consecutive year of AutoCAD for Mac. The native file format of AutoCAD is .dwg

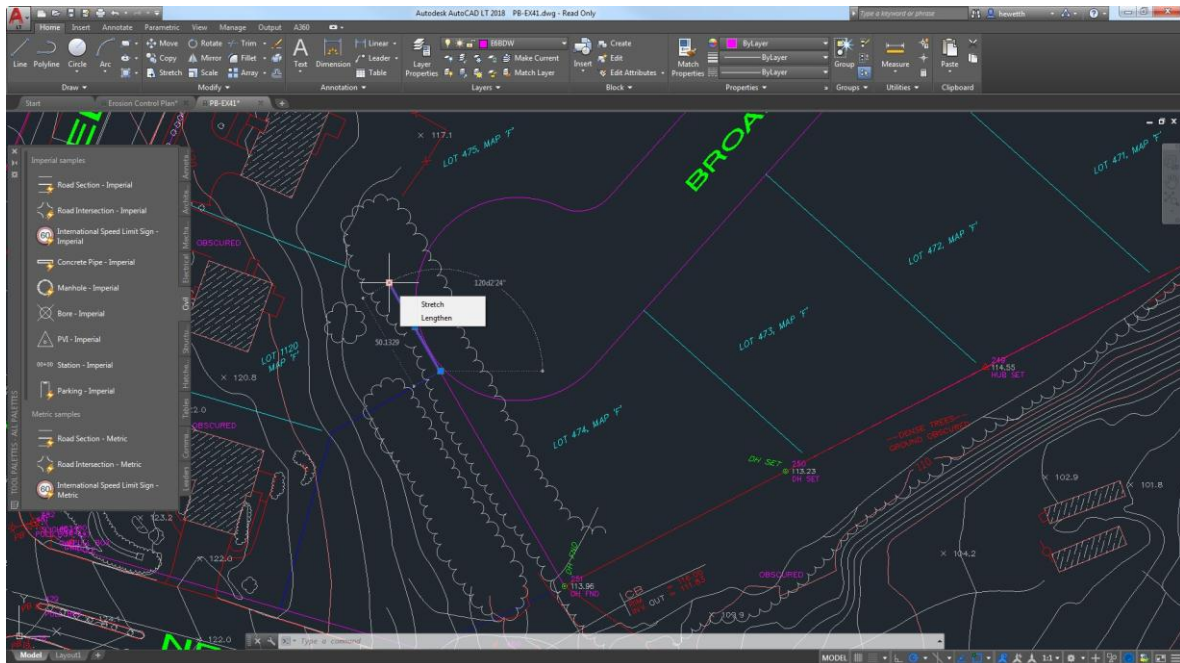
Extension:

- AutoCAD supports a number of APIs for customization and automation. These include AutoLISP, Visual LISP, VBA, .NET and ObjectARX. ObjectARX is a C++ class library.
- Products extending AutoCAD functionality to specific fields.
- Creating products such as AutoCAD Architecture, AutoCAD Electrical, AutoCAD Civil 3D.
- Third-party AutoCAD-based application

- There are a large number of AutoCAD plugins(add-on applications) available on the application store Autodesk Exchange Apps. AutoCAD's DXF, drawing exchange format, allows importing and exporting drawing information.

Advantages:

- Working in AutoCAD is more feasible and practical than if it were to be done by hand. It saves time and is simpler.
- It allows exchanging information not only by paper, but by means of files, and this represents an improvement in speed and effectiveness when interpreting designs.
- It has been linked to multiple platforms, with the benefit of being able to export and import files of all kinds.



Disadvantages:

- The program has a high cost, due to its license.
- Knowing how to fully use the software requires a lot of time since there are many functions, and even that they are of little application, since they are very specific.

9. ABANDONWARE

Definition:

Abandonware refers to software that is ostensibly still protected by copyright, but is no longer supported or marketed. In many cases, the software may be designed for obsolete systems or produced by companies that have since gone out of business. Abandonware is often copied and shared by people without any compensation being paid to the copyright holders. Abandonware may be computer software or physical devices which are usually computerized in some fashion, such as personal computer games, productivity applications, utility software, or mobile phones.

Ethics and Essentials:

As PC gamers, we tend to be as much about the good games of old as the up and coming new releases. While Crysis is all very pretty and fun, there's a lot of nostalgic joy to be had going back to some of the old Infocom titles.

That's true for console gamers too of course and we know loads of people who've hung on to their original GameBoys and Mega Drive but being primarily PC gamers we're in the unique position of being able to get a lot of our favorite old games. Much of this is down to the merit of abandonware the online distribution of games that are no longer available for sale or are owned by companies that have gone out of business. The games are abandoned.



Unfortunately though, abandonware is a bit of a thorny issue in PC gaming circles and, while some developers are happy to give away the licenses on their

back catalogues and let players enjoy them for free, others aren't so kind-hearted. There are even some egregiously greedy companies that will happily hunt you down and sue you for downloading their old games.

Illegal abandonware:

Technically, no, abandonware is not legal. On the other hand though, yes, it is. Except there are some cases when it definitely is legal, or is certainly illegal. Basically, the legality of abandonware varies.

Firstly, a game can be labeled as abandonware if it's so old that a company no longer supports or sells the game in anyway but the license-holder is still viable. An example of this might be an old game like Zak McKracken and the Alien Mindbenders, one of Lucasarts' first graphical adventures. You can't buy Zak McKracken anywhere anymore, except maybe eBay, and it isn't supported by Lucasarts in anyway because the games are so old and outdated.



In this case, yes, abandonware is illegal because while the user couldn't actually go out and buy the game even if the user wanted to, the copyright is still owned by Lucasarts. Lucasarts might choose to make the game available for free (making it freeware), but probably not. If the user downloads it, it's technically piracy. The other main type of abandonware is for old games made and published by games companies that no longer exist – often called orphaned software. In this case it would be illegal to download it, but there's nobody who owns the copyright left to sue you.

10. ACD CANVAS

Definition

ACD Canvas is drawing software used for creating and editing technical illustrations. It is especially used for editing vector-based images and other graphics. The program supports more than 100 input file formats, which include CAD and page layout file types. The software also contains several tools used for enhancing images and visualizing scientific data formats.



ACD Canvas is also used in medical and geological applications to create specialized visualizations. It provides several imaging tools to display the numerical data from medical research images. Seismic data can also be analyzed through the seismic traces palette. The ACD canvas includes a proprietary computer graphics metafile engine that's compliant with Aviation Transportation Authority and Petroleum Industry Protocol standards.

The capability of the ACD Canvas software program includes importing industry-standard file formats; these include:

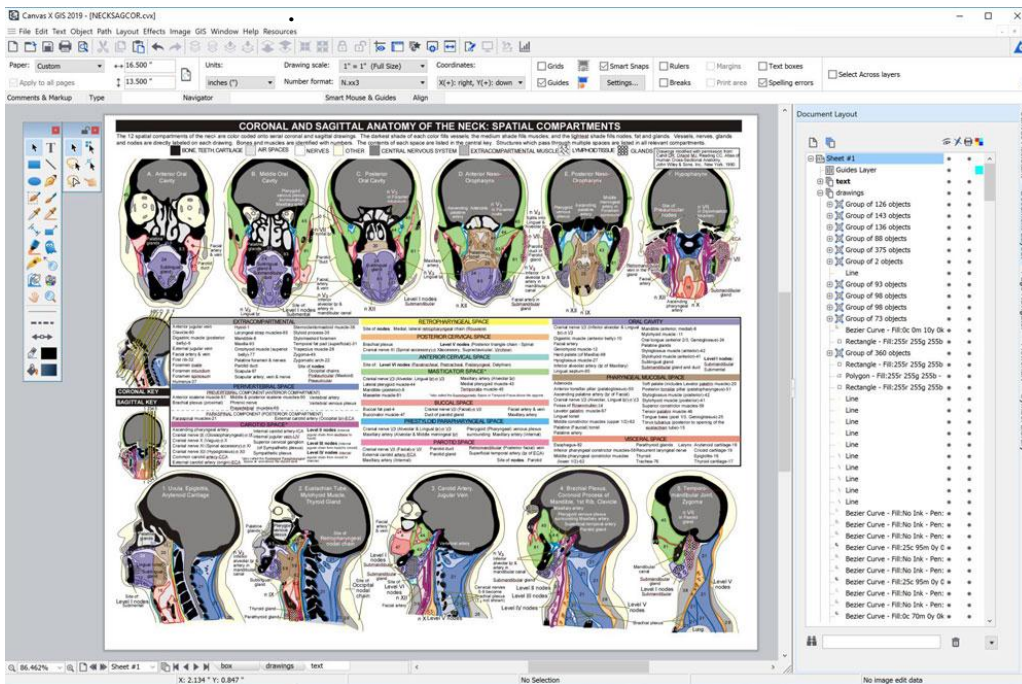
- ❖ AutoCAD (.DWG and .DXF)
- ❖ Photoshop (.PSD and .PDD)
- ❖ DICOM (.DCM)
- ❖ CorelDraw (.CDR)
- ❖ PowerPoint (.PPT)
- ❖ Portable Document Format (.PDF)
- ❖ illustrator (.AI)

It also supports a variety of image file types, including .PNG, .JPEG and .GIF. The primary file extension used by ACD Canvas is .CVX which is the

proprietary file format. The drawings may also be exported using a variety of file types supported by other software programs.

Advantages:

- Retrievable dosage form that allows individualized patient and clinician control over onset and duration of effects and side effects.
- All-day coverage lasting through evening (can have longer duration than current oral methamphetamine preparations).
- Absorption curve smoother than that of oral medication boluses. Absorption completely unaffected by meals or competitive metabolism of co-administered.
- No need to swallow tablets or capsule.



Disadvantages :

- Slower onset than oral preparations.
- Need to remember to remove at correct time.
- Requires attention to temperature for storage.

11. AUTOLISP

History:

AutoLISP was derived from an early version of XLISP, which was created by David Betz. The language was introduced in AutoCAD Version 2.18 in January 1986, and continued to be enhanced in successive releases up to release 13 in February 1995. After that, its development was neglected by Autodesk in favor of more fashionable development environments like VisualBasic for Applications (VBA), .NET Framework, and Object ARX. However, it has remained AutoCAD's main user customizing language.



Vital-LISP, a considerably enhanced version of AutoLISP including an integrated development environment (IDE), debugger, compiler, and ActiveX support, was developed and sold by third party developer Basis Software. Vital LISP was a superset of the existing AutoLISP language that added VBA-like access to the AutoCAD object model, reactors (event handling for AutoCAD objects), general ActiveX support, and some other general Lisp functions. Autodesk purchased this, renamed it Visual LISP, and briefly sold it as an add-on to AutoCAD release 14 released in May 1997. It was incorporated into AutoCAD 2000 released in March 1999, as a replacement for AutoLISP. Since then, Autodesk has ceased major enhancements to Visual LISP and focused more effort on VBA and .NET, and C++. As of January 31, 2014, Autodesk no longer supports VBA versions older than 7.1. This is part of a long-term process of changing from VBA to .NET for user customizing.

AutoLISP has such a strong following that other computer-aided design (CAD) application vendors add it to their products. Bricscad, IntelliCAD and others have AutoLISP functionality, so that AutoLISP users can consider using them as an alternative to AutoCAD. Most development involving AutoLISP since AutoCAD 2000 is performed within Visual LISP since the original AutoLISP engine was replaced with the Visual LISP engine. There are thousands of utilities and applications that have been developed using

AutoLISP or Visual LISP (distributed as LSP, FAS and VLX files.

Features:

AutoLISP is a small, dynamically scoped, dynamically typed Lisp language dialect with garbage collection, immutable list structure, and settable symbols, lacking in such regular Lisp features as macro system, records definition facilities, arrays, functions with variable number of arguments or let bindings. Aside from the core language, most of the primitive functions are for geometry, accessing AutoCAD's internal DWG database, or manipulation of graphical entities in AutoCAD. The properties of these graphical entities are revealed to AutoLISP as association lists in which values are paired with AutoCAD group codes that indicate properties such as definitional points, radii, colors, layers, line types, etc. AutoCAD loads AutoLISP code from .LSP files.



AutoLISP code can interact with the user through AutoCAD's graphical editor by use of primitive functions that allow the user to pick points, choose objects on screen, and input numbers and other data. AutoLisp also has a built-in Graphical User Interface (GUI) mini- or domain-specific language (DSL), the Dialog Control Language, for creating modal dialog boxes with automated layout, within AutoCAD.

Examples:

A simple Hello world program in AutoLISP would be:

```
(defun hello ())  
(princ "\nHelloWorld!")  
(princ)
```

Note the final line inside the function definition: when evaluated with no arguments, the princ function returns a null symbol, which is not displayed by the AutoCAD command-line interface. As the AutoCAD command line functions as a read-eval-print loop (REPL), this would normally print "Hello World!" to the command line, followed immediately by the return value of the call to princ.

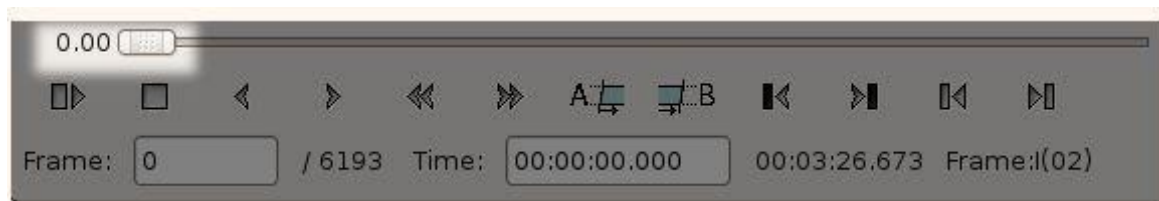
12. AVIDEMUX



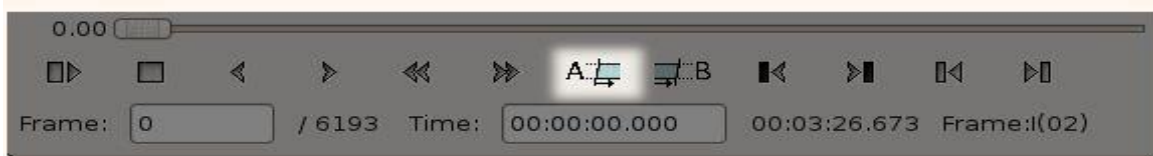
Avidemux is free software which can be used to do some great editing. A user can cut, join, split, rotate videos as well as add filters. Users can learn a lot about how to use Avidemux by viewing various tutorials which are available on numerous websites and blogs. For users with good knowledge of computer can easily handle the software without the help from someone else. However, for beginners, more tips and tricks will be helpful. Here we'd like to share some Avidemux operates on Windows, Mac and Linux platforms. It can perform several important tasks of editing various types of videos.

How to Use Avidemux to Edit Videos: Trim/Split/Cut Videos with Avidemux:

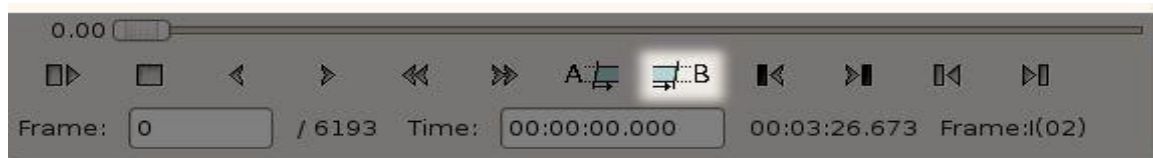
Click File and Open, then choose the video clip you want to trim, and then make sure you're in "Copy" mode. This will be beneficial for you to use the pre- existing video rather than re-encoding it into new file and it will surely save lot of time.



Then, move around until you find the desired frame where you want to trim the file. After getting proper frame, press the "A" button present on the bottom of the toolbar to apply marker A to the current frame.



Use the timeline to progress through to the end of the clip you are creating. Note that this frame does not have to be type "I". Click the B button when you have done this.



Join Videos with Avidemux:

Add your file, and then click on File/Append. You will find out the total video length will increase. Finally click on File/Save/Save Video or simply Ctrl + S to start combining added video files to a new one.

Add Effects to Videos with Avidemux:

Still in the left panel, click on the "Filter" button. You can now choose the effects that you want, from resizing, cropping, labeling, color adding, noise removing, to sharpness adding.

Convert Videos with Avidemux:

Locate to Format panel and select the target format in the drop-down list. The supported output formats include MP4, MPEG, AVIXVID, AVI-DV, MPG, MKV, FLV, etc. Finally click on File/Save/Save Video or simply Ctrl + S to start encoding.

Export Different Audio/Video Formats:

Video file consists of two parts namely: container, which determines the filetype, and codec. In order to play on a specific a device, say, mobile, both container and codec need to be supported by the video player otherwise it will not work properly.

- Audio Formats likeMP3
- Video Formats likeMP4

13. BAITWARE

Freeware of deliberately poor quality with some, but generally not all, of the features of a software application, intended to entice those who download the freeware to buy the complete application.

Types of Baitware:

- Freeware
- Shareware
- Liteware

i) Freeware:

Freeware is copyrighted software, most often proprietary, that is distributed at no monetary cost to the end user. There is no agreed-upon set of rights, license, or EULA that defines freeware unambiguously; every publisher defines its own rules for the freeware it offers. For instance, modification, redistribution by third parties, and reverse engineering without the author's permission are permitted by some publishers but prohibited by others.

Unlike with free and open-source software, which are also often distributed free of charge, the source code for freeware is typically not made available. Freeware may be intended to benefit its producer by, for example, encouraging sales of a more capable version, as in the freemium and shareware business models.

In simple, it is computer software that is available for use at no charge. Common examples include Internet browsers, such as Mozilla Firefox and Google Chrome, the voice-over-IP service Skype, and the PDF filereader Adobe Acrobat. Many basic system maintenance utilities are freeware.



Freeware may be used without payment and is typically either fully functional for an unlimited time or has limited functionality, with a more capable version available commercially or as shareware. In contrast to what the Free Software Foundation calls free software, the author of freeware usually restricts the rights of the user to use, copy, distribute, modify, make derivative works, or reverse engineer the software.

ii) Shareware:

Shareware is a type of proprietary software which is initially provided free of charge to users, who are allowed and encouraged to make and share copies of the program. Shareware is often offered as a download from a website or as a compact disc included with a magazine. Some shareware relies entirely on the user's honesty and requires no password. Simply checking an "I have paid" checkbox in the application is all that is required to disable the registration notices. There is also time limit inbuilt in the software (for example- free for 30 days or 2 months). Below are few examples of shareware

- Apache HTTP web server
- Mozilla's Firefox web browser
- Thunderbird email client
- Database system
- GNU compiler collection
- Moodle
- OpenOffice
- Perl.

iii) Liteware:

Liteware is a term for software that is distributed freely in a version having less capability than the full for-sale version. It's usually designed to provide a potential customer with a sample of the "look-and-feel" of a product and a subset of its full capability. Liteware can be considered a type of shareware (where shareware also includes products distributed freely, usually on a trial basis that do have full capability).

An example of liteware is HTML Assistant Pro, an HTML editor. We tried their liteware version, which allows you to create HTML files (Web pages) and shows you, but doesn't let you use, table and form creation facilities.

14. BESPOKE SOFTWARE

Bespoke software is also known as custom software or tailor-made software.

Consideration:

Custom software is developed for a single customer it can accommodate that customer's particular preferences and expectations, which may not be the case for commercial off-the-shelf software. Custom software may be developed in an iterative processes, allowing all nuances and possible hidden risks to be taken into account, including issues which were not mentioned in the original requirement specifications(which are, as a rule, never perfect). In particular, the first phase in the software development process may involve many departments, including marketing, engineering, research and development and general management.

Large companies commonly develop custom software for critical functions, including content management, inventory management, customer management, human resource management, or otherwise to fill the gaps present in existing software packages. In many cases, such software is legacy software, developed before COTS or free software packages offering the required functionality with an acceptable level of quality or functionality became available or widely-known. For example, the BBC spent a great deal of money on a project to develop its own custom digital media production and



management software, but the project experienced troubles, and after many years of development, was cancelled. A key stated reason for the project cancellation was that it had become clear that commercial off-the-shelf software existed that was, by that point, adequate to the BBC's needs and available for a small fraction of the price.

Custom software development is often considered expensive compared to off-the-shelf solutions or products. This can be true if one is speaking of typical challenges and typical solutions. However, it is not

always true. In many cases, COTS software requires customization to correctly support the buyer's operations. The cost and delay of COTS customization can even add up to the expense of developing custom software. Cost is also not the only consideration in the decision to develop custom software, as the requirements for a custom software project often includes the purchase owning the source code, to secure the possibility to future improvement or modifications to the installed system to handle changing requirements. However, modern COTS often has application programming interfaces (APIs) for extensibility - or occasionally, as in the case of Salesforce.com, a domain-specific language(DSL)- meaning that COTS packages can sometimes accommodate quite a wide variety of custom installations without then need to access our source code of the core COTS system.

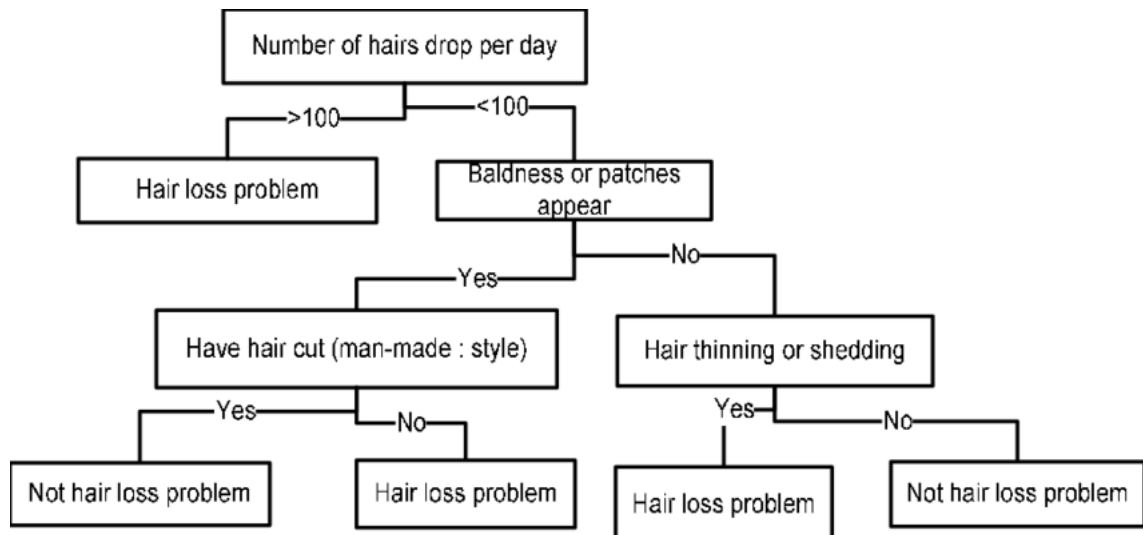
Additionally, COTS comes with upfront license costs which vary enormously, but sometimes run into the millions of US dollars. Furthermore, the big software houses that release COTS products revamp their product very frequently. Thus a particular customization may need to be upgraded for compatibility every two to four years. Given the cost of customization, such upgrades can also turn out to be expensive, as a dedicated product release cycle may have to be earmarked for them. However, in theory, the use of documented APIs and/or DSLs, as opposed to direct access to internal database tables and code modules, for customization can minimize the cost of these upgrades. This is because COTS vendors can opt to use techniques such as making "under the hood" changes while retaining backward compatibility with customizations written for older API or DSL version(s)

- Supporting old API version(s) and new API versions simultaneously in a new version of the software
- Publishing guidance warning that support for old API or DSL versions is to be removed from the product in a subsequent version, to give customers more time to adapt customizations.

The decision to build custom software or go for a COTS implementation would usually rest on one or more of the following factors: Finances - both cost and benefit: The upfront license cost for COTS products mean that a thorough cost-benefit analysis of the business case needs to be done.

15. BACKWARD CHAINING

Backward chaining (or backward reasoning) is an inference method described colloquially as working backward from the goal. It is used in automated theorem provers, inference engines, proof assistants, and other artificial intelligence applications. In game theory, researchers apply it to sub games to find a solution to the game, in a process called backward induction. In chess, it is called retrograde analysis, and it is used to generate table bases for chess endgames for computer chess. Backward chaining is implemented in logic programming by SLD resolution. Both rules are based on the modus ponens inference rule. It is one of the two most commonly used methods of reasoning with inference rules and logical implications – the other is forward chaining. Backward chaining systems usually employ a depth-first search strategy, e.g. Prolog.



Working:

Backward chaining starts with a list of goals and works backwards from the consequent to the antecedent to see if any data supports any of these consequents. An inference engine using backward chaining would search the inference rules until it finds one with a consequent that matches a desired goal. If the antecedent of that rule is known to be true, then it is added to the list of goals. For example, suppose a new pet, Fritz, is delivered in an opaque box along with two facts about Fritz:

- Fritz croaks
- Fritz eats flies

The goal is to decide whether Fritz is green, based on a rule base containing the following four rules:

- 1) If X croaks and eats flies – Then X is a frog
- 2) If X chirps and sings – Then X is a canary
- 3) If X is a frog – Then X is green
- 4) If X is a canary – Then X is yellow

You are looking for what color your pet is there are two options.

- 1) If X croaks and eats flies – Then X is a frog
- 2) If X chirps and sings – Then X is a canary
- 3) If X is a frog – Then X is green
- 4) If X is a canary – Then X is yellow

Try the first option.

- 1) If X croaks and eats flies – Then X is a frog
- 2) If X chirps and sings – Then X is a canary
- 3) If X is a frog – Then X is green
- 4) If X is a canary – Then X is yellow

Iterate through the list and see if you can find if X is a frog.

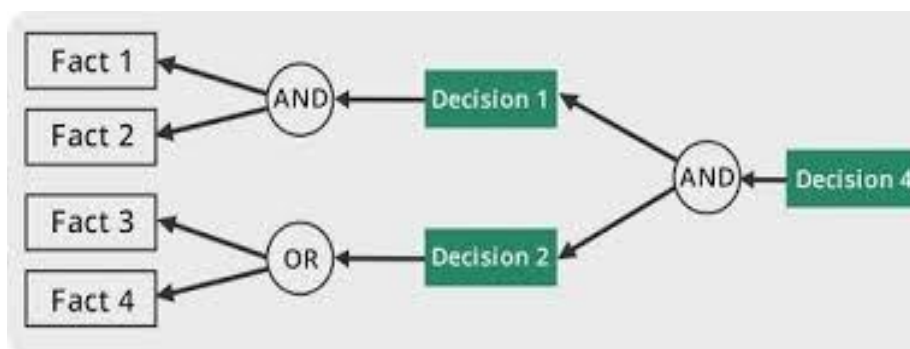
- 1) If X croaks and eats flies – Then X is a frog
- 2) If X chirps and sings – Then X is a canary
- 3) If X is a frog – Then X is green
- 4) If X is a canary – Then X is yellow

Repeat with step 1. X croaks and eats flies is given as true. Since X croaks and eats flies, X is a frog. Since X is a frog, X is green.

An Example of Backward Chaining

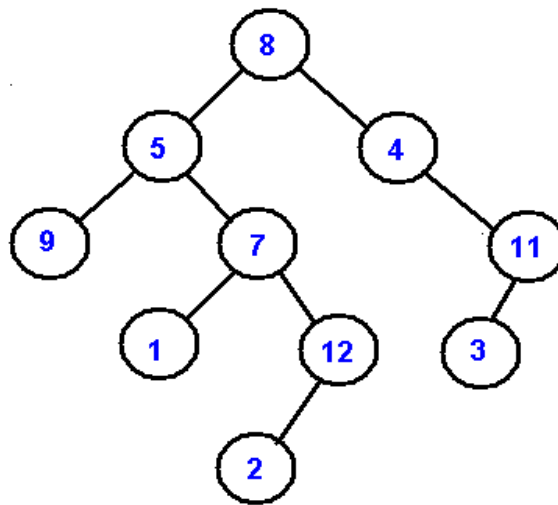
1. **If** X croaks and X eats flies – **Then** X is a frog
2. **If** X chirps and X sings – **Then** X is a canary
3. **If** X is a frog – **Then** X is green
4. **If** X is a canary – **Then** X is yellow

With backward reasoning, an inference engine can determine whether Fritz is green in four steps. To start, the query is phrased as a goal assertion that is to be proved: "Fritz is green".



16. BINARY TREE

A binary tree is a tree data structure in which each node has at most two children, which are referred to as the left child and the right child. A binary tree may thus be also called a bifurcating arborescence. It is also possible to interpret a binary tree as an undirected, rather than a directed graph, in which case a binary tree is an ordered, rooted tree. The following is the structure of a binary tree:

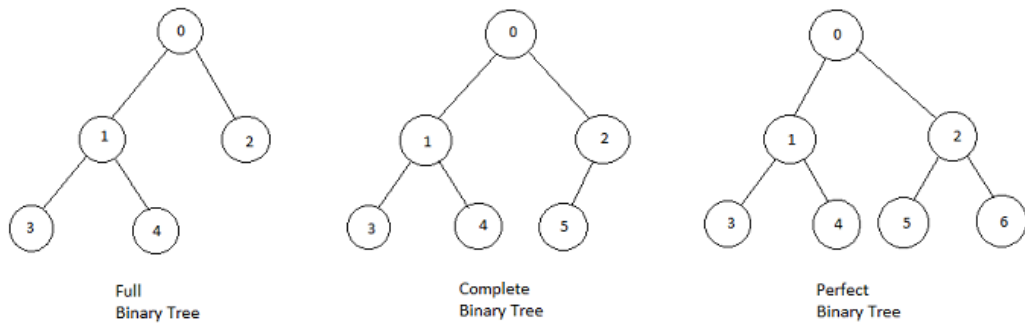


Types of binary trees:

The following are the types of binary trees:

- A rooted binary tree has a root node and every node has at most two children.
- A full binary tree is a tree in which every node has either 0 or 2 children. It is also referred to as a proper or plane binary tree.
- In a complete binary tree every level, except possibly the last, is completely filled, and all nodes in the last level are as far left as possible.
- A perfect binary tree is a binary tree in which all interior nodes have two children and all leaves have the same depth or same level.

- A balanced binary tree is a binary tree structure in which the left and right sub trees of every node differ in height by no more than 1.
- A degenerate (or pathological) tree is where each parent node has only one associated child node. This means that the tree will behave



Common operations:

The following are the common operations of a binary tree:

- **Insertion:** Nodes can be inserted into binary trees in between two other nodes or added after a leaf node. In binary trees, a node that is inserted is specified as to which child it is.
- **Leaf nodes:** To add a new node after leaf node A, A assigns the new node as one of its children and the new node assigns node A as its parent.
- **Deletion:** Deletion is the process whereby a node is removed from the tree. Only certain nodes in a binary tree can be removed unambiguously
- **Traversal:** Pre-order, in-order, and post-order traversal visit each node in a tree by recursively visiting each node in the left and right sub trees of the root.

17. BLOATWARE

Definition:

Bloatware is software that has unnecessary features that use large amounts of memory and RAM. Software comes to be known as bloatware when it becomes so unwieldy that its functionality is drowned out by its useless features. This is also known as software bloat.

Bloatware is also a slang term for numerous programs that are pre-installed on new PCs. Many of these programs are limited trial versions designed to entice new users to buy or subscribe to the full-featured versions.



(Bloatware)

Pre-Installed Issues:

Bloatware usually occurs as a result of feature creep. Because software is traditionally redesigned on a yearly basis, many developers feel the need to add additional functionality in order to entice users into upgrading the existing software. Unfortunately, the added features increase the size of the program and the system requirements needed to run it smoothly, eventually forcing the user to upgrade in order to run the latest software.

Software vendors pay computer manufacturers and distributors to install demonstration versions of their products onto devices, hoping customers will buy the full versions. These demonstration versions of software come in two varieties: slimmed-down copies with limited functionality and fully functional versions with limited lifetimes.

Unfortunately, unless users actively search for and delete demonstration software and they rarely do these programs remain on devices and become part of a growing mound of software debris. Gradually, the bloatware weighs down the device's processing speed. Opening even small applications on a cluttered hard disk can take far too long.

Bloatware:

Software development tools and approaches often result in changes throughout a program to accommodate each feature, leading to a large-scale inclusion of code which affects the main operation of the software, and is required in order to support functions that themselves may be only rarely used. In particular, the advances in resources available have led to tools which allow easier development of code, again with less priority given to end efficiency.

Another cause of bloatware is independently competing standards and products, which can create a demand for integration. There are now more operating systems, browsers, protocols, and storage formats than there were before, causing bloat in programs due to interoperability issues.

A program that once could only save in text format is now demanded to save in

- HTML
- XML
- XLS
- CSV
- PDF
- DOC and other formats

These are the present formats which can be Bloatwares.

18. BLOGWARE

Blogware is a CMS tool, created to manage small sites like weblogs and community sites, using the power of PHP + MySQL and XHTML + CSS, with dynamic refresh of content.

Benefits of Blogware:

Blogware makes sharing with family, friends and colleagues easy and fun whether it is pictures, videos, links, documents, presentations, newsletters or opinions. Blogware provides you with several options with which to post email on the web, or even your cellular phone

Examples of Blogware:

- Movable Type is a weblog publishing system developed by the company Six Apart. It was publicly announced on September 3, 2001, version 1.0 was publicly released on October 8, 2001. On 12 December 2007, Movable Type was relicensed as free software under the GNU General Public License. The current version is 5.12.
- WordPress is an open source blogging tool and publishing platform powered by PHP and MySQL often customized into a content management system (CMS). It has many features including a plug-in architecture and a template system.

Free blog software (online):

1.Wordpress.com:

As the world's most popular blogging platform, WordPress is an obvious choice for many first-time bloggers. WordPress actually has two iterations – .org and .com. WordPress.com,

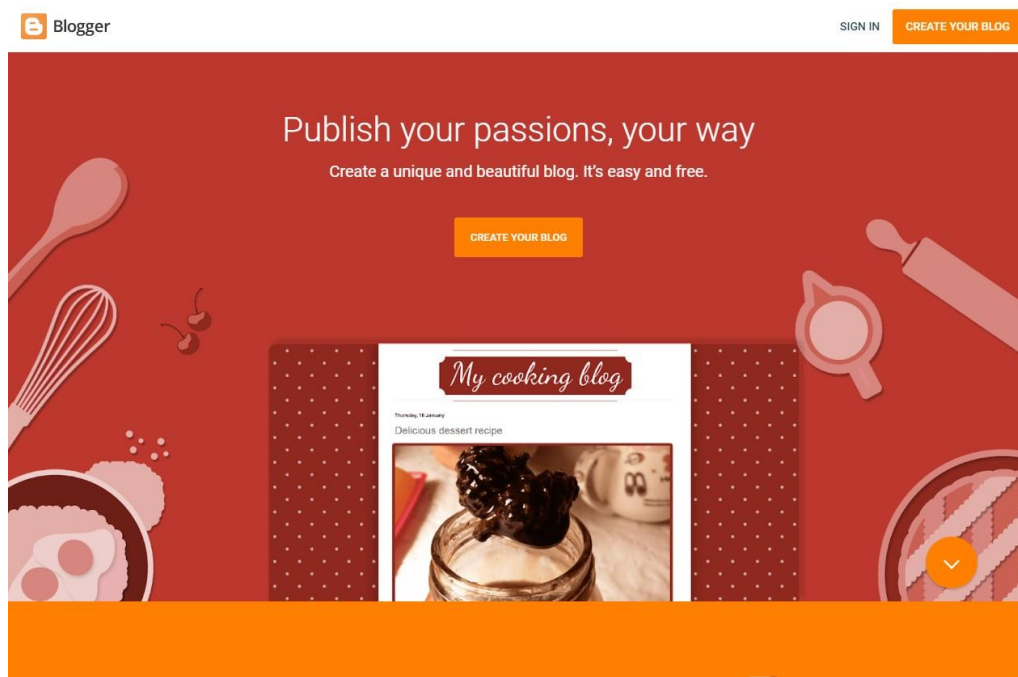


www.wordpress.com

which we talk about here, represents the browser-based site-building platform, and it has both free and paid options. The free version of WordPress.com is a simple platform with limited themes, no customization options, and no plugins. You can't run ads on a free WordPress.com site but on the plus side, you don't have to do any of the maintenance on your site. WordPress.com is a top choice for the no-frills blogger, and there are premium plans available if the basics aren't enough.

2. Blogger:

Blogger is a Google-owned platform that doesn't require any technical skill to use. Like WordPress.com, it's as basic as blogging gets. It has many built-in tools, called widgets, and many of these are Google Apps that integrate directly with Blogger.



www.blogspot.com

Blogger has fewer features, templates, and expansions to enhance site design than WordPress. Because of the limitations on site growth, people using their blog for a business might find WordPress to be a better free or low-cost option. However, Blogger can be an ideal choice for the absolute beginner whose main concern is getting published.

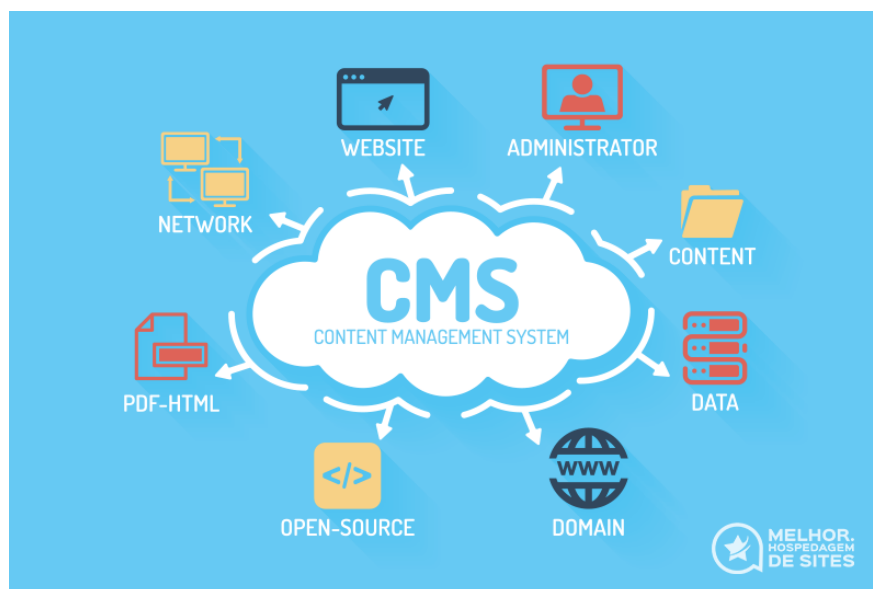
19. BOASTMACHINE

Boastmachine is a free open source blogging package developed in PHP that uses a MySQL backed. First released in 2002, it was one of the first blogging packages available on the web. The project is no longer being developed or maintained, so a demo site is not available at this time, but you can set up your own Boastmachine demo by downloading the files from Github and going through the installation process. Some examples of features include multiple blogs, authors, user levels and profiles, file manager, anti-spam protection and themes.

Boastmachine can also be seen as a super light content management system with a powerful backup/restore system. The last version available for download is v3.1 and was released on June 5, 2005. Boastmachine CMS is no longer active.

What is a CMS?

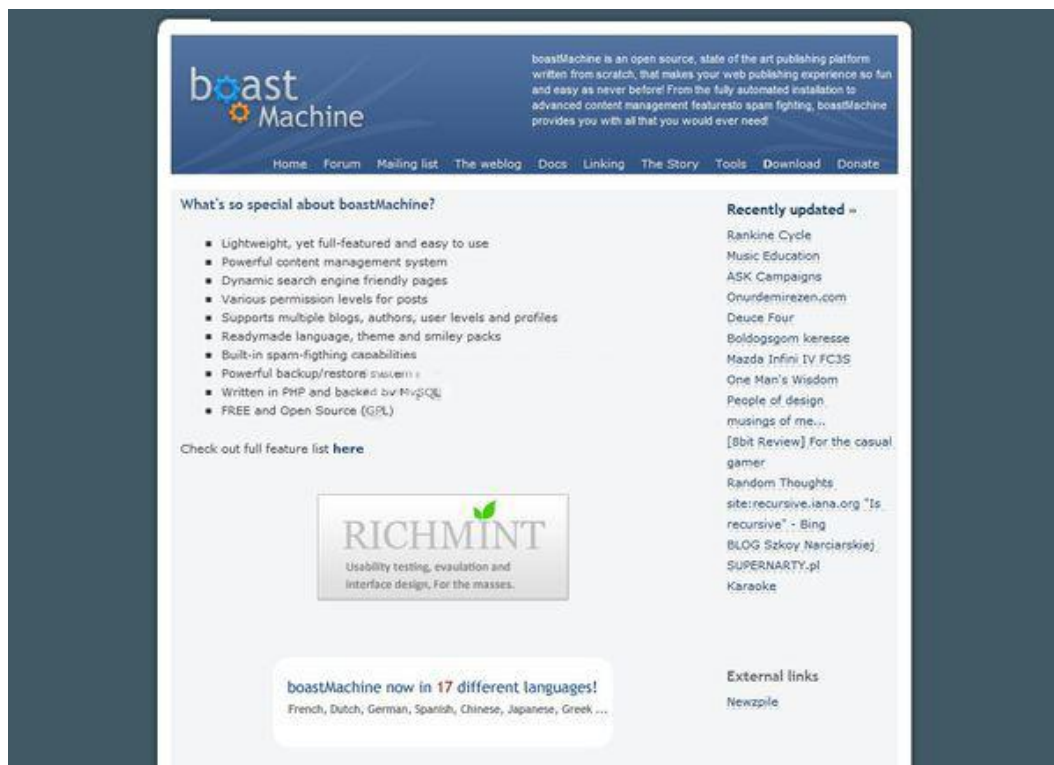
A CMS (Content Management System) is a software application or set of related programs that are used to create and manage digital content. CMS's are typically used for enterprise content management and web content management.



The entire point of CMS is to allow a user to modify database information, template files and design styles without having to understand how a database works. This is done through the user interface.

What's so special about boastMachine?

- Lightweight, yet full-featured and easy to use
- Powerful content management system
- Dynamic search engine friendly pages
- Various permission levels for posts
- Supports multiple blogs, authors, user levels and profiles
- Readymade language, theme and smiley packs
- Built in spam fighting capabilities
- Powerful backup/restore system
- Written in PHP and backed by MySQL
- Free and Open Source (GPL).



Official website: www.boastology.com

Version/Model: 3.1

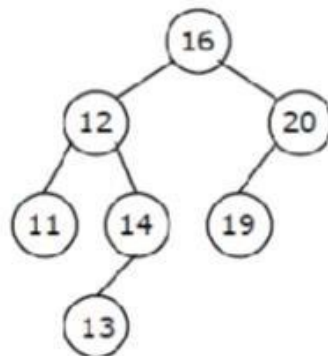
Last updated: 17/7/2005

Developer: Kailash Nadh.

20. BINARY SEARCH TREE

In a binary tree, every node can have maximum of two children but there is no order of nodes based on their values. To enhance the performance of binary tree, a special type of binary tree is used, known as Binary Search Tree. Binary search tree mainly focus on the search operation in binary tree.

Binary Search Tree can be defined as binary tree in which every node has only smaller values in its left subtree and only larger values in its right subtree. In a binary search tree, all the nodes in left subtree of any node contains smaller values and all the nodes in right subtree of that contains larger values. In this tree, left subtree of every node contains nodes with smaller values and right subtree of every node contains larger values.



Operations on a Binary Search Tree:

The following operations are performed on a binary search tree.

- Search
- Insertion
- Deletion
- **Search operation:**

Searching for a node is similar to inserting a node. It starts from root, and then go left or right until we find or not find the node.
- **Insert operation:**

Insertion starts from the root node, if the node to be inserted is less than the root, go to left child, and otherwise to the right child of the root.

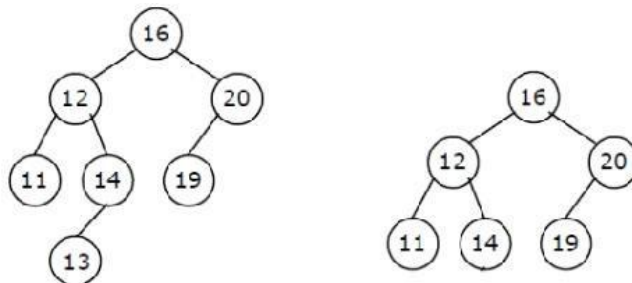
- **Delete operation:**

To delete a node from a binary search tree, the method to be used depends on whether a node to be deleted has one child, two children, or no children.

- A node to be deleted has no child.
- A node to be deleted has only one child.

- **A node to be deleted has no child:**

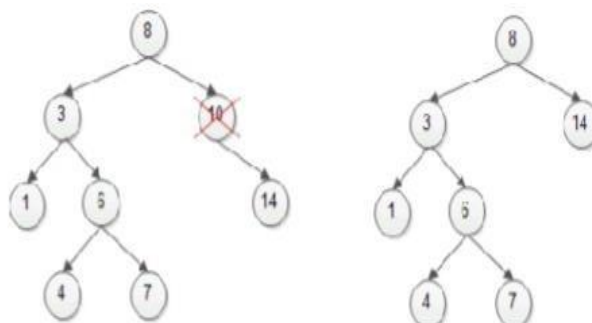
To delete a leaf node, set the pointer of its parent pointing to the node to NULL and delete the node.



To delete 13 from the above tree, where 13 is a leaf node set the left pointer of 14 to NULL and then deletes 13.

- **A node to be deleted has only one child:**

To delete a node with one child, set the pointer of its parent pointing to this node to point the child of the node and delete the node.



To delete 10 from the tree, where 10 is a node having only one child that is 14, set the right pointer of 8 (parent of 10) to point 14 and then delete 10.

21. COMPUTER AIDED ENGINEERING

Introduction:

Computer Aided Engineering (CAE) is the broad usage of computer software to aid in engineering analysis tasks. It includes Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), Multi Body Dynamics(MBD), durability and optimization.

Aided computer technologies:



Computer Aided Technologies (CAT) is the use of computer technology to aid in the design, analysis and manufacture of products. Advanced CAT tools merge many different aspects of the Product Lifecycle Management (PLM), Including design, Finite Element Analysis (FEA), manufacturing, production planning, product.

- Computer-Aided Design(CAD)
- Computer-Aided Fixture Design(CAFD)
- Computer-Aided Innovation(CAI)

Such an enhanced engineering process is also referred to as predictive engineering analysis.

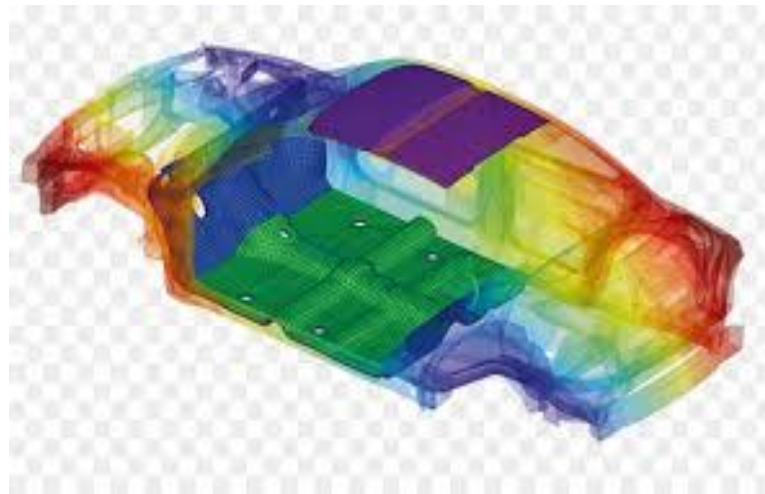
Tools for the trade:

Since there are several aspects of engineering that need to be covered while designing/modeling a system or entity, there are many facts to the CAE

software tools. Some of the leading CAE tools include CATIA, HyperMesh Software.

The future of CAE in the product development process:

CAE software companies and manufacturers are constantly looking for tools and process improvement to change this situation. On the software side, they are constantly looking to develop more powerful solvers, better use computer resource and include engineering knowledge in pre and post-processing. CAE try a better to integrate a product lifecycle management.



ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> • Produce system with a longer effective operational life. • Produce system with excellent documentation. • Procedure systems that need less system support. • Produce more flexible systems. 	<ul style="list-style-type: none"> • Produce initial system that are more expensive to built and maintain. • May be difficult to customize. • Require training of maintenance stable. • May be difficult to use with existing systems.

Conclusion: The Internet is a fundamental element of our daily existence. Computer engineering empowers make a difference in today’s world.

22. CAREWARE

Careware (also called charityware, helpware, or goodwill) is software licensed in a way that benefits a charity. Some careware is distributed free, and the author suggests that some payment be made to either a nominated charity, or a charity of the user's choice. Commercial careware, on the other hand, includes a levy for charity on top of the distribution charge. It can also be a barter of some kind, or even a pledge to be kind to strangers. The concept of careware and the first known use of the term itself appeared in Dr. Dobb's Journal in Al Stevens' C Programming Column in about 1988. Stevens was developing a user interface library and publishing the source code in monthly installments.



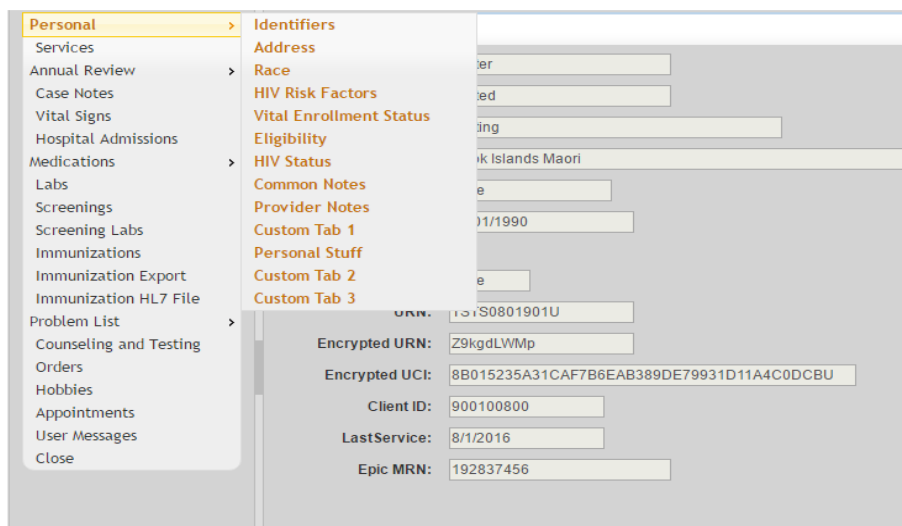
To distribute code to readers, Stevens suggested they send him an addressed stamped mailer with a blank diskette. He copied the code onto the diskette and returned it. He also suggested that to express their appreciation they include a dollar, which he would donate to the local food bank in Brevard County, Florida. Stevens named this distribution method "careware". Paul Lutus's careware idea involves no monetary exchange - instead it involves a request for the user to "stop complaining for a while and make the world a better place." For example, the vim text editor is free software but includes a request from its author, Bram Moolenaar, that users donate to ICCF Holland for work to help AIDS victims in Uganda. Vim's Charityware license has been declared by Richard Stallman to be GPL-compatible. Another current example

is MJ's CD Archiver, a file archiver for Microsoft Windows/Linux/Mac OS X. They suggested charity is NACEF, a US-registered charity for China's Project Hope. A close variation of careware is donation ware, which has a stricter definition than careware.

What is Charityware?

First of all, charityware is not a license but a status. The status of charityware is compatible with any type of license, including the General Public License and other Free or Copyleft licenses, the various Creative Commons licenses, commercial licenses, etc. In general, charityware (a.k.a. careware) is any software that supports charity. It promotes any and all types of charityware, including:

- Free charityware is completely free. You are under no obligation to donate money, but are encouraged to do so.
- Open-Source charityware is free and the software's source code is available. Users are allowed to change the code and pass along the modified version. Again, users are encouraged to make a donation. Examples include Vim and XPlanet.
- Commercial charityware is software for which the proceeds are split between the developing company and a supported charity.



The image shows a screenshot of a patient record interface. On the left is a sidebar menu with categories like Personal, Services, Annual Review, Case Notes, Vital Signs, Hospital Admissions, Medications, Labs, Screenings, Screening Labs, Immunizations, Immunization Export, Immunization HL7 File, Problem List, Counseling and Testing, Orders, Hobbies, Appointments, User Messages, and Close. The main area displays a list of tabs: Identifiers, Address, Race, HIV Risk Factors, Vital Enrollment Status, Eligibility, HIV Status, Common Notes, Provider Notes, Custom Tab 1, Personal Stuff, Custom Tab 2, and Custom Tab 3. Below these tabs, several fields are visible, including URN (101S0801901U), Encrypted URN (Z9kgdLWMp), Encrypted UCI (8B015235A31CAF7B6EAB389DE79931D11A4C0DCBU), Client ID (900100800), LastService (8/1/2016), and Epic MRN (192837456).

About charityware:The mission is to promote the use of charityware by creating a central location where socially-minded consumers can learn about charityware created by philanthropic software developers from around the world.

23. CATIA SOFTWARE SUITE

Introduction:

CATIA started as an in-house development in 1977 by French aircraft manufacturer AVIONS MARCEL DASSAULT, at that time customer of the CADAM software to develop Dassault's Mirage fighter jet. It was later adopted by the aerospace, automotive, shipbuilding, and other industries.

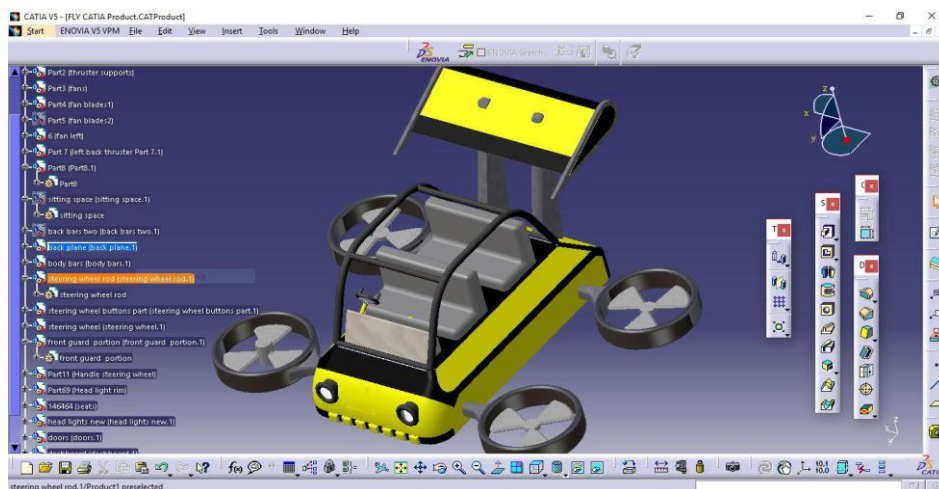


History:

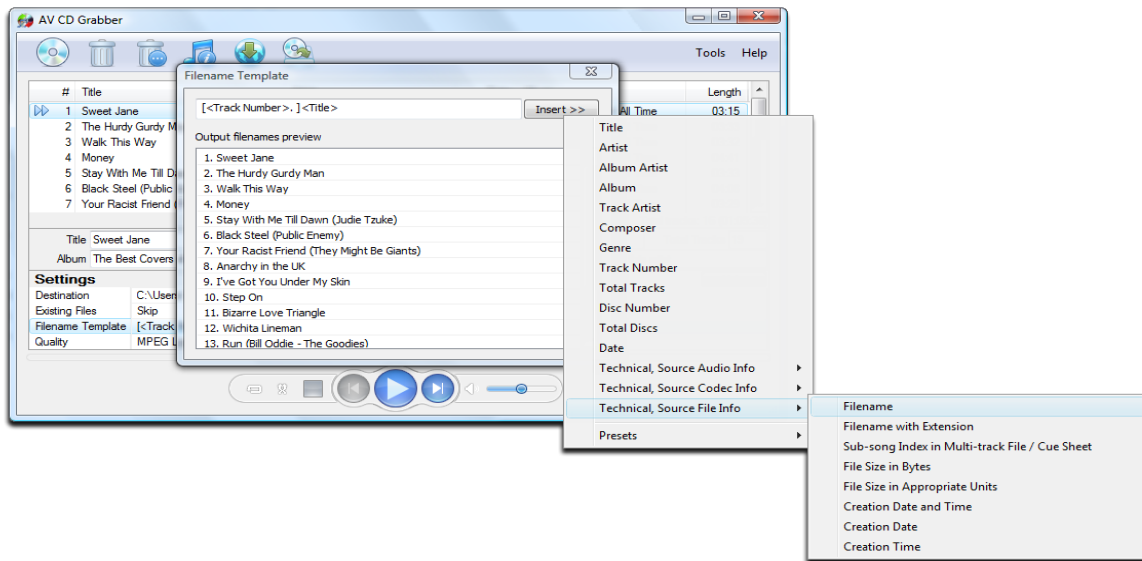
Initially named CATI (conception tri-dimension interactive-French for interactive aided three-dimensional design), it was renamed CATIA in 1981 when Dassault created a subsidiary to develop and sell the software and signed a non-exclusive distribution agreement with IBM.

- In 1984, the Boeing Company chose CATIA V2 as its main 3D CAD tool, becoming its largest customer.
- In 1988, CATIA V3 was ported from mainframe computers to Unix.
- In 1990, General Dynamics Electric Boat Corp chose CATIA as its main 3D CAD tool to design the U.S. Navy's Virginia class submarine. Also, Lockheed was selling its CADAM system worldwide through the channel of IBM since 1978.
- In 1992, CADAM was purchased from IBM, and the next year CATIA CADAM V4 was published.
- In 1996, it was ported from one to four Unix operating systems, including IBM AIX, Silicon Graphics IRIX, Sun Microsystems SunOS, and Hewlett-Packard HP-UX.

- In 1998, V5 was released and was an entirely rewritten version of CATIA with support for UNIX, Windows NT and Windows XP (since 2001).
- In the years prior to 2000, problems caused by incompatibility between versions of CATIA (Version 4 and Version 5) led to \$6.1B in additional costs due to years of project delays in production of the Airbus A380.
- In 2008, Dassault Systems released CATIA V6. While the server can run on Microsoft Windows, Linux or AIX, client support for any operating system other than Microsoft Windows was dropped.
- In November 2010, Dassault Systems launched CATIA V6R2011x, the latest release of its PLM2.0 platform, while continuing to support and improve its CATIA V5 software.
- In June 2011, Dassault Systems launched V6 R2012.
- In 2012, Dassault Systems launched V6 2013x.
- In 2014, Dassault Systems launched 3DEXPERIENCE Platform R2014x and CATIA on the Cloud, a cloud version of its software.
- In 2018, Dassault Systems launched 3DEXperience Marketplaces to connect CATIA Users, with manufacturers, standard parts creators and engineers.
- In 2019, 3DEXperience Marketplaces launched an Add-in in CATIA, to connect directly manufacturers with designers.



24. CD GRABBER



Overview:

A CD ripper, CD grabber, or CD extractor is software that converts tracks on a Compact Disc to standard computer sound files, such as WAV, MP3, or OggVorbis. It rips raw digital audio in CD-DA format on a compact disc to a file or other output.

History:

In the early days of computer CD-ROM drives and audio compression mechanisms (such as MP2), CD ripping was considered undesirable by copyright holders, with some attempting to retrofit copy protection into the simple ISO9660 standard. As time progressed, most music publishers became more open to the idea that since individuals had bought the music, they should be able to create a copy for their own personal use on their own computer. This is not yet entirely true, even with some current digital music delivery mechanisms, there are considerable restrictions on what an end user can do with their paid for (and therefore personally licensed) audio. Windows Media Player's default behavior is to add copy protection measures to ripped music, with a disclaimer that if this is not done, the end user is held entirely accountable for what is done with their music. This suits most users who simply

want to store their music on a memory stick, MP3 player or portable hard disk and listen to it on any PC or compatible device.

Design:

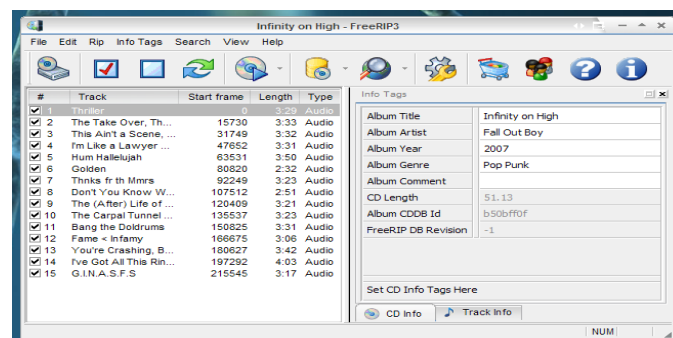
As an intermediate step, some ripping programs save the extracted audio in a lossless format such as WAV, FLAC, or even raw PCM audio. The extracted audio can then be encoded with a lossy codec like MP3, Vorbis, WMA or AAC. The encoded files are more compact and are suitable for playback on digital audio players. They may also be played back in a media player program on a computer.

Most ripping programs will assist in tagging the encoded files with metadata. The MP3 file format, for example, allows tags with title, artist, album and track number information. Some will try to identify the disc being ripped by looking up network services like AMG's LASSO, Free DB, Grace note's CDDb, GD3 or Music Brainz, or attempt text extraction if CD-Text has been stored.

Some all-in-one ripping programs can simplify the entire process by ripping and burning the audio to disc in one step, possibly re-encoding the audio on-the-fly in the process.

Optical Drive Properties:

Properties of an optical drive helping in achieving a perfect rip are a small sample-offset (at best zero), no jitter, no or deactivate able caching, and a correct implementation and feed-back of the C1 and C2 error-states. There are databases listing these features for multiple brands and versions of optical drives. Also, EAC has the ability to AutoDetect some of these features by a test-rip of a known reference CD.



25. CELESTIA

Celestia is a 3D astronomy program created by Chris Laurel. The program is based on the Hipparcos Catalogue (HIP) and allows users to virtually travel through an extensive universe, modeled after reality, at any speed, in any direction, and at any time in history. Celestia displays and interacts with objects ranging in scale from small spacecraft to entire galaxies in three dimensions using OpenGL, from perspectives which would not be possible from a classic planetarium or other ground-based display.

Celestia is available for AmigaOS 4, Linux, macOS, and Microsoft Windows. Celestia is free and open source software released under the GNU General Public License. There are three graphical front-ends available: GLUT, GTK+ or Qt, Size: Linux: 27.7 MB; AmigaOS 4: 44.4 MB; MacOS: 38.7 MB; Windows: 32.8 MB; Source code: 52.6 MB, Programming languages: C++, Lua.

In late 2016, the official Celestia forums were restored, and development of update 1.7.0 began.



Functions:

Celestia displays the Hipparcos Catalogue (HIP) of 118,322 stars. Celestia uses the very accurate VSOP87 theory of planetary orbits. This makes it possible to provide a solar and lunar eclipse finder and to display the orbital paths of planets (including extrasolar planets), dwarf planets, moons, asteroids,

comets, artificial satellites, and spacecraft. The user can vary the number of stars that are visible on the screen and have them drawn in different styles.

Using simple keyboard controls, Celestia users can travel/fly through the Celestia universe at any speed from 0.001 m/s to millions of light years per second. Viewpoints can be set to look forward, backward, or at any angle to the direction of travel. Controls allow users to orbit stars, planets, moons, and other space objects, track space objects such as spacecraft, asteroids, and comets as they fly by, or travel to and/or fly through nebulae and irregular, elliptical, and spiral galaxies (over 10,000 galaxies included).

Limitations:

The default setting for Celestia's Earth is a spheroid. The irregular surface of the Earth causes low Earth orbit satellites to appear to be in the wrong places in the sky when watched from Celestia's ground, even when the Earth's oblateness is specified. Many types of astronomical objects are not included with Celestia. Variable stars, supernovae, black holes, and nebulae are missing from the standard distribution. Although objects that form part of a planetary system move, and stars rotate about their axes and orbit each other in multiple star systems, stellar proper motion is not simulated, and galaxies are at fixed locations.



Reception and impact:

NASA and ESA have used Celestia in their education and outreach programs, as well as for interfacing to trajectory analysis software. Celestia became a popular program made available for downloading by multiple free software websites.

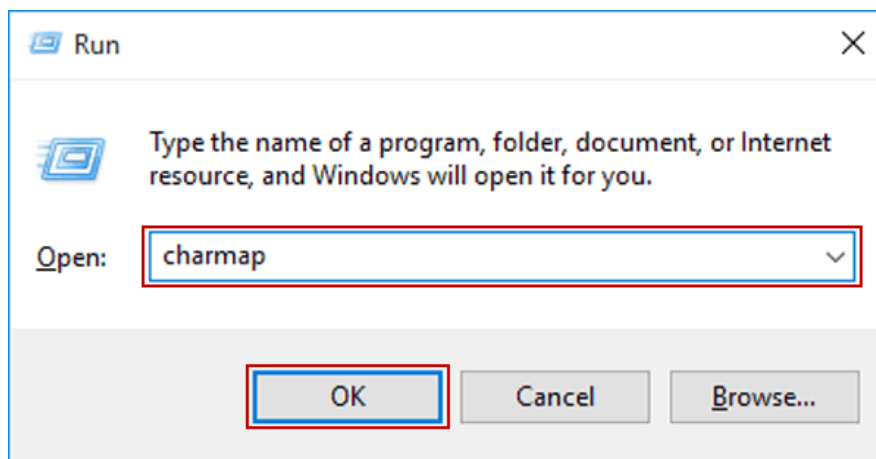
26. CHARMAP

Introduction:

Character Map is a utility included with Microsoft Windows operating systems and is used to view the characters in any installed font, to check what keyboard input Alt code is used to enter those characters. The tool is usually useful for entering special characters. It can be opened via the command-line interface or Run command dialog using the 'charmap' command.

Overview:

The Advanced view check box can be used to inspect the character sets in a font according to different encodings code pages, including Unicode code ranges, to locate particular characters by their Unicode code point and to search for characters by their Unicode name. The Advanced view check box can be used to inspect the character sets in a font according to different encodings code pages including Unicode code ranges, to locate particular characters by their Unicode code point and to search for characters by their Unicode name.



Other operating systems:

Other operating systems such as some Unix-Linux variants with GUIs, the HP-48 series graphing calculators and others also have a similar accessory.

The OS/2 analogue of the character map called the Characters Map is available from third parties for systems from OS/2 Warp 3 onwards to current eCom Station versions. There is also a Macintosh version.

Implementation:

A Character map utility allows a user to view and enter characters without having a relevant keyboard layout. Implementations include:

- Character Map (Windows), component of Microsoft Windows for viewing and copying characters
- GNOME Character Map, utility of GNOME for viewing and entering characters
- Haiku Character Map, component of the Haiku Operating System for viewing and entering characters.

How to open the Windows Character Map or charmap:

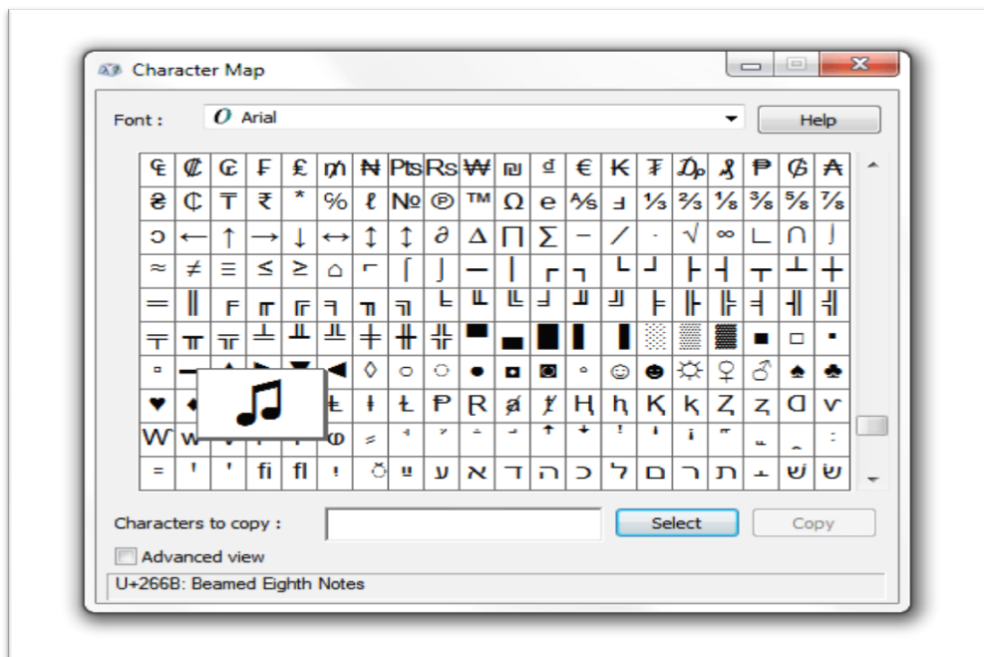
The following describes the using the charmap tool in different windows operating system.

Windows 7, 8, and 10 users:

Click Start, open Windows Accessories, and choose Character Map. Or, press the Windows key, type charmap, and press Enter.

Windows XP and earlier users:

Click Start, Run, and type charmap and press Enter.



27. CLEARCASE SOFTWARE

Rational ClearCase is a family of computer software tools that supports software configuration management (SCM) of source code and other software development assets. It also supports design-data management of electronic design artifacts, thus enabling hardware and software co-development. ClearCase includes revision control and forms the basis for configuration management at large and medium-sized businesses, accommodating projects with hundreds or thousands of developers. It is developed by IBM.

Infrastructure:

The database system that ClearCase uses is RDM Embedded from Raima. In ClearCase terminology, an individual database is called a VOB (Versioned Object Base). On this layer, maintenance takes place using Raima tooling. Around this layer, a set of interfaces with accompanying tools are used to manage the physical database system, which requires specific Database administrator skills.

The most important service is the Atria location Broker Daemon (ALBD), which manages all (LAN) communication between computers. Beginning with version 7, the server platform runs Web sphere Application Server with a server application called the Change Management Server (CM Server), which served ClearCase clients via the HTTP Protocol. CM server has since been replaced by the ClearCase Remote Client Wide-Area Network Server (CCRC WAN server), which continues to be based on Web sphere Application Server.

Views:

A distinguishing feature of ClearCase is the Multi Version File System (MVFS), a proprietary networked file system which can mount VOBs as a virtual file system through a dynamic view, selecting a consistent set of versions and enabling the production of derived objects. This was a departure from the repository-and-sandbox model because it enabled the early management of artifacts (that is, before they are checked in) and was not limited to the management of these first-order configuration items.

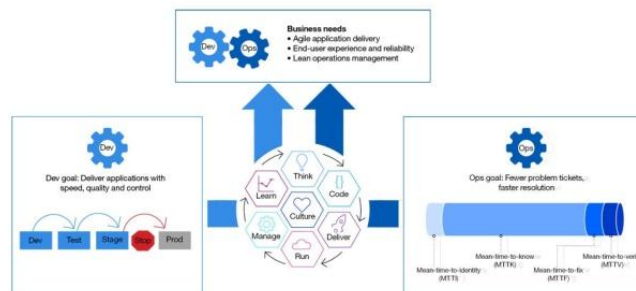
ClearCase also supports snapshot views, which are copies of repository data. As opposed to dynamic views, snapshot views are maintained on a local

(OS-specific) file system and do not require network access. Snapshot views can be used while disconnected from the network and later synchronized with the VOB when a connection is re-established. This mode of operation is similar to that of CVS (Concurrent Versions System) software.

The configuration specification Builds:

The networked file system provided by MVFS allows for build auditing. Builds in views that use the MVFS can monitor and record file I/O operations performed during the build process and associate each such event with the command that triggered it. This allows ClearCase to produce a bill-of-materials which it calls a Configuration Record (CR) for all builds and enable traceability for either software configuration management purposes or as part of a larger application lifecycle management process. The bill-of-materials artifact produced as the result of build auditing is known as the Configuration Record. It contains:

- The build procedure: The method (script, make file, and so on) that invoked the build.
- Inputs: All files (and their specific versions) that were used for a particular build.
- Outputs: All derived object (DO) files (and any dependent DOs) produced as a result of the build.



Database replication:

ClearCase Multi Site enables developers at different locations to use the same ClearCase versioned object base (VOB). Each location (site) has its own copy (replica) of the VOB. Data synchronization via any protocol can be unidirectional or bidirectional.

28. CLISP

The Common Lisp Object System (CLOS) is the facility for object-oriented programming which is part of ANSI Common Lisp. CLOS is a powerful dynamic object system which differs radically from the OOP facilities found in more static languages such as C++ or Java. CLOS was inspired by earlier Lisp object systems such as MIT Flavors and Common Loops, although it is more general than either.

Preface About Common Lisp:

Common Lisp (CL) is a dialect of the lisp programming language

Published in ANSI INCITS226-1994(R1999) .The Common lisp hyper spec a hyper lined HTML version has been derived from the ANSI Common lisp standard.



History about common lisp:

DESIGNED BY - SCOTTF AHLMAN &
DAN WEINREB

DEVELOPED BY - ANSI X3J13 COMMITTEE

FIRST APPEARED IN -1984, 1994 for ANSI Common Lisp.

Detail about common lisp:

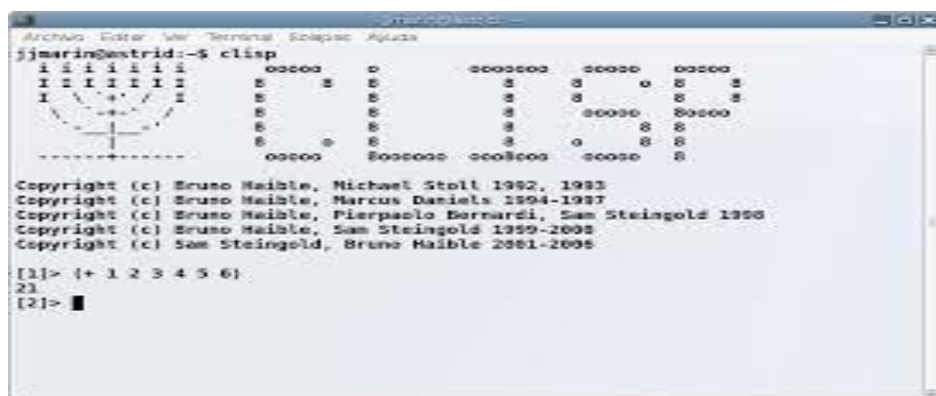
The Common Lisp language was developed as a standardized of the early 1980s several groups were already at work on diverse to lisp machine

lisp .Lisp is not an implementation of the common lisp . The condition System is responsible for exception handling in common lisp. It provides conditions, handlers, and restarts Conditions are objects describing an exceptional situation if a condition is signaled, the common lisp system searches for a handler for this condition typed.

Data types in common lisp language:

Number-types includes: integer, ratios, floating-point numbers and complex numbers and Complex numbers. Common Lisp uses big num to represent numerical values of arbitrary size and precision. The ratio type represents fractions exactly, a facility not available in many languages.

Lisp is the second-oldest high-level programming language after For-train and has changed about what is a computer program and what is a computer programming language



Object systems:

- The common lisp. Object -system. CLOS is an integral part of ANSI Common lisp was the first object oriented programming languages (1994, ANSI X3J13)
- LOOPS and the later LOOPS are used
- Lisp was the first language where the structure of program code is represented as Standard data structure
- A conditional using an if else syntax was invented by ALGOL.

29. CODE CO-OP

Code Co-op is a distributed revision control system of the replicated type.

It uses peer-to-peer architecture to share projects among developers and to control changes to files. Instead of using a centralized database (the repository), it replicates its own database on each computer involved in the project.

The replicas are synchronized by the exchange of (differential) scripts. The exchange of scripts may proceed using different transports, including e-mail (support for SMTP and POP3, integration with MAPI clients, Gmail) and LAN.

Code Co-op has a built-in peer-to-peer wiki system, which can be used to integrate documentation with a software project. It is also possible to create text-based Wiki databases, which can be queried using simplified SQL directly from wiki pages.

Standard features:

1. Distributed development support through E-mail, LAN, or VPN
2. Change-based model—modifications to multiple files are checked in as one transaction
3. File additions, deletions, renames, and moves are treated on the same level as edits—they can be added in any combination to a check-in change set
4. File changes can be reviewed before a check-in using a built-in or user-defined differ
5. Synchronization changes can be reviewed in the same manner by the recipients
6. Three-way visual merge
7. Project history is replicated on each machine. Historical version can be reviewed, compared, or restored
8. Integration with Microsoft SCC clients, including Visual Studio

History:

Code Co-op was one of the first distributed version control systems. It debuted at the 7th Workshop on System Configuration Management in May 1997.

The development of Code Co-op started in 1996, when Reliable Software, the distributed software company that makes it, was established. Reliable Software needed a collaboration tool that would work between the United States and Poland. The only dependable and affordable means of communication between the two countries was e-mail, hence the idea of using e-mail for the exchange of diffs. Of course, with such slow transport, using a centralized repository was infeasible. Each user of Code Co-op had to have a full replica of the repository, including the history of changes.

Theoretical foundations:

Code Co-op is an example of a distributed database. Local repositories are considered the replicas of this virtual database. Each check-in corresponds to a distributed commit—a non-blocking version of a two-phase commit.

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Code Co-op is an example of a distributed database. Local repositories are considered the replicas of this virtual database. Each check-in corresponds to a distributed commit—a non-blocking version of a two-phase commit.



External links:

- Official website
- ColdFusion Developer's Journal: Code Co-op Version Control Software from Reliable Software
- Lark ware News: Review: Code Co-op at the Way back Machine (archived 2008-07-25).

30. COLDFUSION

Introduction:

Adobe ColdFusion is a commercial rapid web-application development platform created by J.J. The programming language used with that platform is also commonly called ColdFusion, though is more accurately known as CFML. Cold Fusion was originally designed to make it easier to connect simple HTML pages to a database.

Overview:

Distinguishing features of ColdFusion is its associated scripting language, ColdFusion Markup Language CFML. CFML compares to the scripting components of ASP, JSP, and PHP in purpose and features, but its tag syntax more closely resembles HTML, while script resembles JavaScript. ColdFusion is often used synonymously with CFML, but there are additional CFML application servers besides ColdFusion, and ColdFusion supports programming languages other than CFML, such as server-side Action script and embedded scripts that can be written in a JavaScript-like language known as CFScript.



Main features:

- Simplified database access
- Client and server cache management
- Client-side code generation, especially for form widgets and validation
- Conversion from HTML to PDF
- File indexing and searching service based on Apache Solr
- GUI administration

- Server, application, client, session, and request scopes
- Server clustering
- Task scheduling
- Graphing and reporting
- Data retrieval from common enterprise systems such as Active Directory, LDAP, SMTP, POP, HTTP, FTP, MicrosoftExchange Server and common data formats such as RSS and Atom.

Other features:

All versions of ColdFusion prior to 6.0 were written using Microsoft Visual C++. This meant that ColdFusion was largely limited to running on Microsoft Windows, although Allier did successfully port ColdFusion to Sun Solaris starting with version 3.1.

```
<cfscript>
    users = todos
                .filter((todo) => todo.completed)
                .map((todo) => todo.userId);
</cfscript>
```

Interactions with other programming languages:

ColdFusion and Java:

The standard ColdFusion installation allows the deployment of ColdFusion as a WAR file or EAR file for deployment to standalone application servers, such as Macromedia JRun, and IBM Web Sphere. ColdFusion can also be deployed to servlet containers such as Apache Tomcat and Mortbay Jetty, but because these platforms do not officially support ColdFusion, they leave many of its features inaccessible. As of ColdFusion 10 Macromedia JRun was replaced by Apache Tomcat.

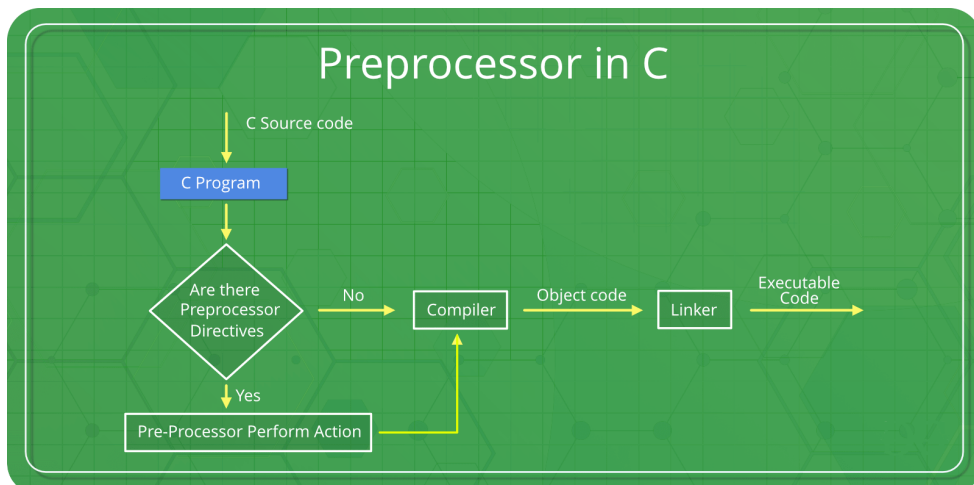
31. COMPILER DIRECTIVE

Directive:

In computer programming, a directive or pragma (from "pragmatic") is a language construct that specifies how a compiler (or other translator) should process its input. Directives are not part of the grammar of a programming language, and may vary from compiler to compiler. They can be processed by a preprocessor to specify compiler behavior, or function as a form of in-band parameterization.

Objective:

In some cases directives specify global behavior, while in other cases they only affect a local section, such as a block of programming code. In some cases, such as some C programs, directives are optional compiler hints, and may be ignored, but normally they are prescriptive, and must be followed. This term could be used to refer to proprietary third party tags and commands (or markup) embedded in code that result in additional executable processing that extends the existing compiler. The term "directive" is also applied in a variety of ways that are similar to the term command.



The C preprocessor:

In C and C++, the language supports a simple macro preprocessor. Source lines that should be handled by the preprocessor, such as #define and #include are referred to as preprocessor directives. Another C construct, the #pragma directive, is used to instruct the compiler to use pragmatic or

implementation-dependent features. Two notable users of this directive are OpenMP and OpenACC

History:

Directives date to ALGOL 68, where they are known as pragmat (from "pragmatic"), and denoted pragmat or pr; in newer languages, notably C, this has been abbreviated to "pragma" (no 't'). A common use of pragmat in ALGOL 68 is in specifying a stropping regime, meaning "how keywords are indicated". Various such directives follow, specifying the POINT, UPPER, RES (reserved), or quote regimes. Note the use of stropping for the pragmat keyword itself (abbreviated pr), either in the POINT or quote regimes.

Directive	Summary of Meaning
#define identifier	Defines a compilation symbol.
#undef identifier	Undefines a compilation symbol.
#if expression	If the expression is true, the compiler compiles the following section.
#elif expression	If the expression is true, the compiler compiles the following section.
#else	If the previous #if or #elif expression is false, the compiler compiles the following section.
#endif	Marks the end of an #if construct.
#region name	Marks the beginning of a region of code; has no compilation effect.
#endregion name	Marks the end of a region of code; has no compilation effect.
#warning message	Displays a compile-time warning message.
#error message	Displays a compile-time error message.
#line indicator	Changes the line numbers displayed in compiler messages.
#pragma text	Specifies information about the program context.

Other languages:

- In Ada, compiler directives are called pragmas
- In Common Lisp, directives are called declarations
- In Turbo Pascal, directives are called significant comments
- Assembly language: In assembly language, directives, also referred to as pseudo-operations or "pseudo-ops", generally specify such information as the target machine, mark separations between code sections, invoke macros, define reserved memory areas.

32. CONFIG.SYS

Definition:

CONFIG.SYS is a text file containing DOS (Disk Operating System) commands that tell the operating system how the computer is initially set up.

Introduction :

- CONFIG.SYS is a configuration file on DOS systems. It is a text file that contains the settings and commands to load drives in a DOS system. This is a primary configuration file for OS/2 and DOS OS. This file was introduced in DOS and is replaced for 32-bit Windows versions with CONFIG.NT.
- The CONFIG.SYS file is read every time a DOS system is booted. The



system then reads that file and executes the command following it. Users can easily make changes as per their requirements by simply saving changes in the CONFIG.SYS file. Since it is a text file, it can be edited in any editing program. This file is located in the root directory of the drive; this is the same location from where system is booted.

Common Commands In The CONFIG.SYS File:

- BUFFERS
- FILES

Buffers:

This command is used to specify the buffer size

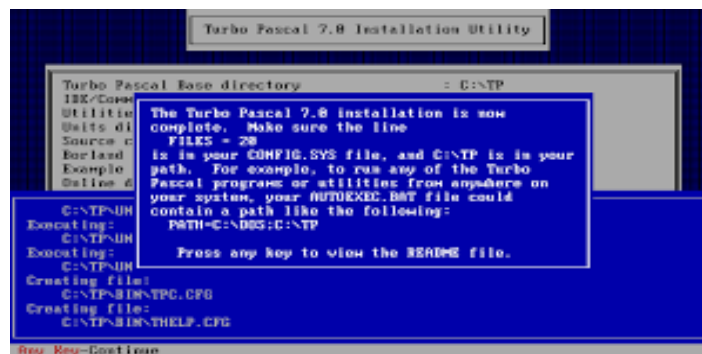
Files:

This command is used to determine the number of files that a user can open simultaneously.

To configure config.sys:

Press "Windows-R" to open the Run menu. Type "cmd" (without quotes here and in subsequent commands) and press "Enter" for a command prompt. Type "cd\" and press "Enter." Type "edit config.sys" in the command window to open an editor for the Config.sys file.

Objective:



Type in the configuration options for your Config.sys file. The most common Config.sys commands are the following:

- DEVICE=C:\WINDOWS\HIMEM.SYS\DOS=HIGH,UMB
DEVICE=C:\WINDOWS\EMM386.EXE noems
- The Himem.sys file is a high memory manager, into which the next command "DOS=HIGH, UMB" loads DOS. "EMM386" is the extended-memory support and is generally disabled with the "noems" command.
- Add any devices you need to load to Config.sys with the "DEVICEHIGH" command, such as "DEVICEHIGH=C:\ATAPI\CDROM.sys" for a CD-ROM drive.

Conclusion:

The config.sys is a system file used with MS-DOS and OS/2 that is loaded each time the computer first boots up. This file controls components connected to the computer such as memory and other hardware devices with early computers.

33. COSMIC OS

Introduction:

Cosmic-OS is a Custom ROM based on Android Open Source Project (AOSP) with additional features, performance and battery life improvements.



Cosmic OS is a self-contained message designed to be understood primarily by treating it as a computer program and executing it. It is inspired by Hans Freudenthal's Lincos and resembles the programming language Scheme in many ways.

Facilities:

- Self-contained messages are of interest for CETI research, but there is much difference of opinion over the most appropriate encoding and broadcast medium to use.
- Cosmic OS is released in modular form, so that the basic message can be adapted to a particular concrete instantiation.
- The message is released under the GPL licence.

Objective:

- Cosmos is an evolving, open source, NET-based operating system development tool. The acronym stands for "C# Open Source Managed Operating System."

- Cosmos shares some characteristics of Singularity, a Microsoft research project devoted to the development of new operating systems.
- Cosmos was conceived by a former employee of Microsoft but the project itself is independent from Microsoft.



Logo of Cosmic OS

Features:

- With Cosmos, developers can create and debug their own custom operating systems using Visual Studio .NET, Microsoft's visual programming environment for creating Web services based on use of the Extensible Markup Language (XML).
- The ROM has gone under a full rebase over CAF and includes best Optimizations.
- With the New Rebase, we also have new Logo.
- New Boot animation, New about Cosmic-OS App, New Wallpapers and many exciting stuffs.
- From now onwards, only selected features will be added to keep the ROM Clean as well as Stable.

34. CRACK INTRO

Introduction:

A crack intro, also known as a cracktro, loader, or just intro, is a small introduction sequence added to cracked software. It aims to inform the user which "cracking crew" or individual cracker removed the software's copy protection and distributed the crack.

Crack intro history:

- They first appeared on computer in the late 1970s or early 1980s, and then on ZX Spectrum, Commodore 64 and games that were distributed around the world via Bulletin Board Systems(BBSes) and floppy disk copying.
- Even the commercially available ISEPIC cartridge, which produced memory dumps of copy-protected Commodore 64 software, added a custom crack intro to the snapshots it produced. Early crack intros resemble graffiti in many ways, although they invaded the private sphere and not the public space.
- As time went on, crack intros became a medium to demonstrate the purported superiority of a cracking group. Such intros grew very complex, sometimes exceeding the size and complexity of the software itself.



Objective:

- Cracking groups would use the intros not just to gain credit for cracking, but to advertise their BBSes, greet friends, and gain themselves recognition.
- Messages were frequently of a vulgar nature, and on some occasions made threats of violence against software companies or the members of some rival crack-group.
- Crack-intro programming eventually became an art form in its own right, and people started coding intros without attaching them to a crack just to show off how well they could program.
- This practice evolved into the demoscene.

Demoscene Crack intro:



- The demoscene is an international computer art subculture focused on producing demos: self-contained, sometimes extremely small, computer programs that produce audio-visual presentations. The purpose of a demo is to show off programming, visual art, and musical skills. Demos and other demoscene productions are shared at festivals known as demo parties, voted on by those who attend, and released online.
- The demoscene's roots are in the home computer revolution of the late 1970s, and the subsequent advent of software cracking.

Conclusion:

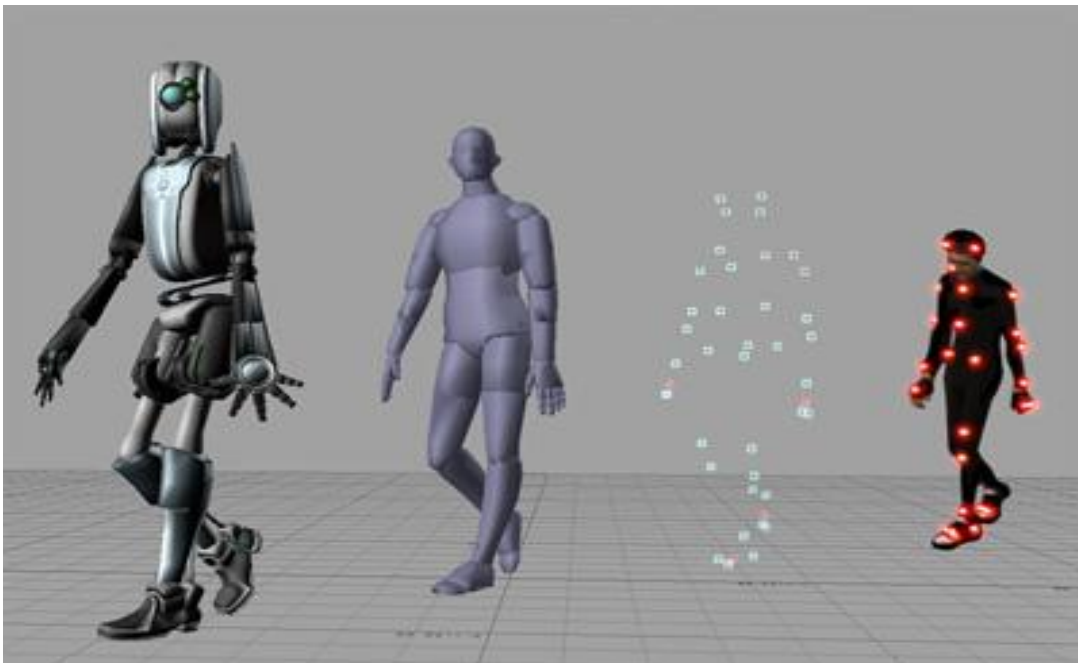
Crackers altered the code of video games to remove copy protection, claiming credit by adding introduction screens of their own ("cracktros"). They soon started competing for the best visual presentation of these additions. Through the making of intros and stand-alone demos, a new community eventually evolved, independent of the gaming 29–30 and software sharing scenes.

35. CROWD SIMULATION

Introduction :

Crowd simulation is the process of simulating the movement (or dynamics) of a large number of entities or characters. It is commonly used to create virtual scenes for visual media like films and video games, and is also used in crisis training, architecture and urban planning, and evacuation simulation.

Crowd simulation may focus on aspects that target different applications. For realistic and fast rendering of a crowd for visual media or virtual cinematography, reduction of the complexity of the 3D scene and image-based rendering are used, while variations in appearance help present a realistic population



Related Work :

The main observation from related work in this aspect is that evaluation is fragmented across many works and that, while some efforts have been made, no standardized benchmarks are defined and widely accepted in the field of crowd simulation.

Architecture Overview:

Presently we are designing and implementing an integrated architecture to generate realistic crowd simulation with a wide variety of individualistic behaviors.

MACES: Multi-Agent Communication for Evacuation Simulation MACES computes agent navigation at two levels. MACES computes agent navigation at two levels.

High Level:Way finding:

The high level component of MACES involves finding a path towards an exit. In order to achieve this, agents will perform different actions depending on their roles that will allow them to explore and learn the features of the environment.

Low Level: Local Motion:

The local motion within each room is based on Helbing's model which describes human crowd behavior with a mixture of socio-psychological and physical forces.

N of mass m_i like to move with a certain desired speed v_i^0 in a certain direction

$$m_i \frac{dv_i}{dt} = m_i \frac{v_i^0(t)e_i^0(t) - v_i(t)}{\tau_i} + \sum_{j(\neq i)} f_{ij} + \sum_W f_{iw}$$

e_i^0 and they tend to adapt their instantaneous velocity v_i within a certain time interval τ_i . At the same time, the individuals try to keep a distance from other individuals j and from the walls w using interaction forces f_{ij} and f_{iw} . The change of velocity in time t is given by the acceleration equation.

Conclusion:

The team is working towards developing a crowd simulation system able to achieve a wide variety of emergent behaviors based on validated human psychological factors.

36. CYCLOMATIC COMPLEXITY

Description:

The cyclomatic complexity of a section of source code is the number of linearly independent paths within it. For instance, if the source code contained no control flow statements (conditionals or decision points), the complexity would be 1, since there would be only a single path through the code. If the code had one single-condition IF statement, there would be two paths through the code: one where the IF statement evaluates to TRUE and another one where it evaluates to FALSE, so the complexity would be 2. Two nested single-condition IFs, or one IF with two conditions, would produce a complexity of 3.

Mathematically, the cyclomatic complexity of a structured program is defined with reference to the control flow graph of the program, a directed graph containing the basic blocks of the program, with an edge between two basic blocks if control may pass from the first to the second. The complexity M is then defined as

$$M = E - N + 2P,$$

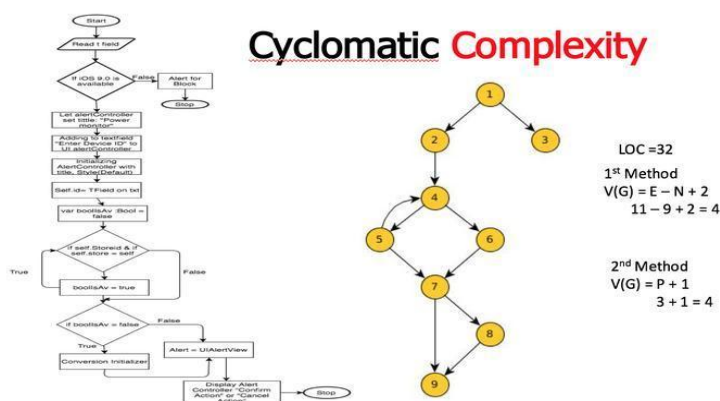
where

E = the number of edges of the graph.

N = the number of nodes of the graph.

P = the number of connected components.

Explanation in terms of algebraic topology

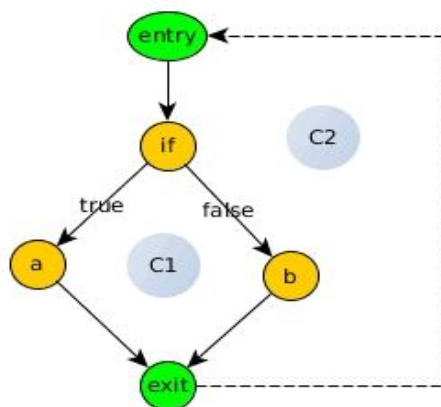


The set of all even subgraphs of a graph is closed under symmetric difference, and may thus be viewed as a vector space over GF(2); this vector space is called the cycle space of the graph. The cyclomatic number of the graph is defined as the dimension of this space. Since GF(2) has two elements and the cycle space is necessarily finite, the cyclomatic number is also equal to the 2-logarithm of the number of elements in the cycle space.

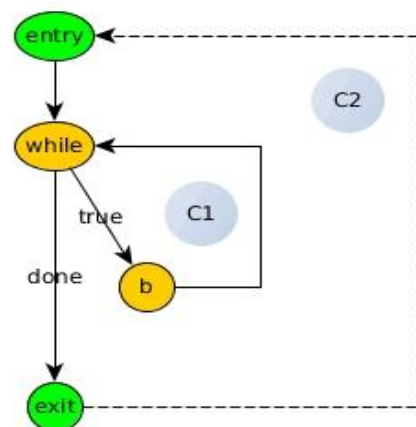
A basis for the cycle space is easily constructed by first fixing a spanning forest of the graph, and then considering the cycles formed by one edge not in the forest and the path in the forest connecting the endpoints of that edge.

Applications:

One of McCabe's original applications was to limit the complexity of routines during program development; he recommended that programmers should count the complexity of the modules they are developing, and split them into smaller modules whenever the cyclomatic complexity of the module exceeded 10. This practice was adopted by the NIST Structured Testing methodology, with an observation that since McCabe's original publication, the figure of 10 had received substantial corroborating evidence, but that in some circumstances it may be appropriate to relax the restriction and permit modules with a complexity as high as 15. As the methodology acknowledged that there were occasional reasons for going beyond the agreed-upon limit, it phrased its recommendation as "For each module, either limit cyclomatic complexity to [the agreed-upon limit] or provide a written explanation of why the limit was exceeded."



$$v(G) = 6 - 5 + 1 = 2$$



$$v(G) = 5 - 4 + 1 = 2$$

37. DATALOG

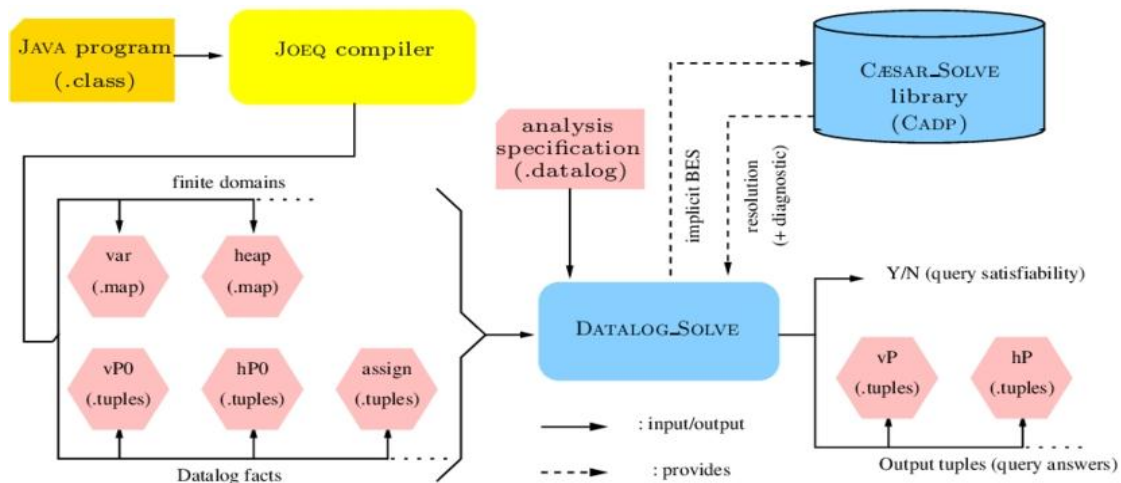
Definition:

Datalog is a declarative programming language that syntactically is a subset of Prolog. It is often used as a language for deductive databases. In recent years, Datalog has found new application in data integration, information extraction, networking, program analysis, security, and cloud computing.

Its origins date back to the beginning of logic programming, but it became prominent as a separate area around 1977 when Hervé Gallaire and Jack Minker organized a workshop on logic and databases. David Maier is credited with coining the term Datalog.

Features:

Unlike in Prolog, statements of a Datalog program can be stated in any order. Furthermore, Datalog queries on finite sets are guaranteed to terminate, so Datalog does not have Prolog's cut operator. This makes Datalog a fully language. In contrast to Prolog, Datalog disallows complex terms as arguments of predicates, e.g., $p(1, 2)$ is admissible but not $p(f(1), 2)$, imposes certain stratification restrictions on the use of negation and recursion, requires



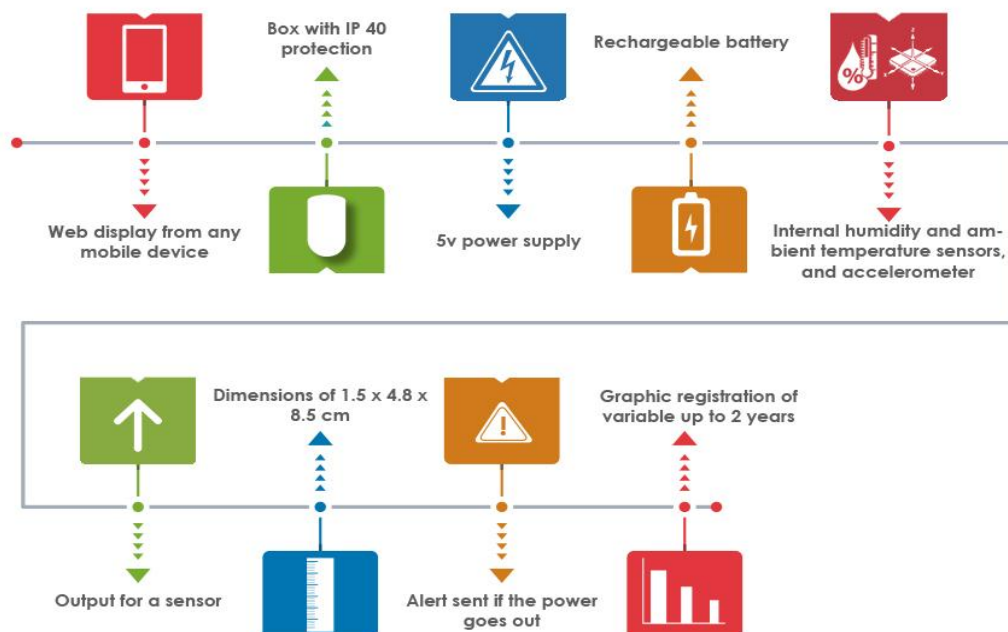
that every variable that appears in the head of a clause also appears in a non arithmetic positive (i.e. not negated) literal in the body of the clause, requires that every variable appearing in a negative literal in the body of a clause also appears in some positive literal in the body of the clause.

Limitations:

Query evaluation with Datalog is based on first-order logic, and is thus sound and complete. However, Datalog is not Turing complete, and is thus used as a domain-specific language that can take advantage of efficient algorithms developed for query resolution. Indeed, various methods have been proposed to efficiently perform queries, e.g., the Magic Sets algorithm, tabled logic programming or SLG resolution.

Extensions:

Some widely used database systems include ideas and algorithms developed for Datalog. For example, the SQL:1999 standard includes recursive queries, and the Magic Sets algorithm (initially developed for the faster evaluation of Datalog queries) is implemented in IBM's DB2. Moreover, Datalog engines are behind specialised database systems such as Intellidimension's database for the semantic web. Several extensions have been made to Datalog, e.g., to support aggregate functions, to allow object-oriented programming, or to allow disjunctions as heads of clauses. These extensions have significant impacts on the definition of Datalog's semantics and on the implementation of a corresponding Datalog interpreter.



38. DATABASE ADMINISTRATOR

Overview:

A database administrator (DBA) is a specialized computer systems administrator who maintains a successful database environment by directing or performing all related activities to keep the data secure. The top responsibility of a DBA professional is to maintain data integrity. This means the DBA will ensure that data is secure from unauthorized access but is available to users.

A database administrator will often have a working knowledge and experience with a wide range of database management products such as Oracle-based software, SAP and SQL, in addition to having obtained a degree in Computer Science and practical field experience and additional, related IT certifications.



Job description:

Computer systems design and related services firms, banks, insurance companies, universities and health care are a few of the many different types of industries that a database administrator will find work. In addition to being responsible for backing up systems in case of power outages or other disasters, a DBA is also frequently involved in tasks related to training employees in database management and use, designing, implementing, and maintaining the database system and establishing policies and procedures related to the organization's data management policy.

How do i become a database administrator?

A bachelor's degree in computer science or a related field is what many employers prefer when hiring a database administrator, along with practical related experience. Although in some cases a DBA may be hired with an associate's degree or a certificate in a computer-related subject plus work experience, a master's degree is required for higher-level positions.

Employers will often look for candidates with experience in automation, DB2, MS SQL, Oracle Database, Hadoop and/or PostgreSQL. Being certified as a MCDBA or MCSD for .NET is also a certification aspiring DBAs should consider.



Key job duties and responsibilities:

A database administrator's responsibilities can include the following tasks:

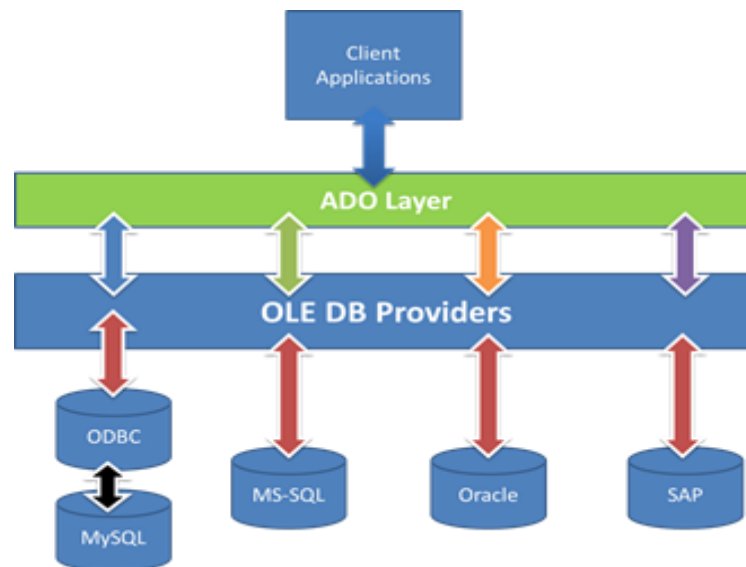
- Installing and upgrading the database server and application tool
- Allocating system storage and planning requirements for the database
- Modifying the database structure by application developers
- Enrolling users and maintaining system security
- Ensuring compliance with database vendor license agreement
- Controlling and monitoring user access to the database
- Monitoring and optimizing the performance of the database
- Planning for backup and recovery of database information
- Maintaining archived data.

39. DBASE

Definition:

DBase is a microcomputer database management system (DBMS) that runs on a Windows platform. DBase is unique in that it allows for the hassle-free production of a wide variety of applications, including middleware applications, Web apps hosted on Windows servers and Windows rich client applications.

DBase is designed to manipulate relational databases. It is a versatile third-generation language with non-procedural capability and is a very good debugger.



History:

DBase can be traced back to 1978, when it was created by Wayne Ratliff and initially named the "Vulcan." In the 1980s, Ashton-Tate purchased Vulcan and marketed it as DBase II, which is considered to be the first DBase version. DBase II was compatible with a 16-bit control program for microcomputers. Subsequent versions like DBase III, III+ and DBase IV were used on 16-bit DOS platforms. Further versions like Visual DBase 5.5 and Visual DBase 5.7 worked on 16-bit Windows platforms. Visual DBase 7.0, Visual DBase 7.5, dB2K and DBase Plus are more recent versions that operate on 32-bit Windows platforms. As of 2011, DBase Plus is the most widely used version.

Database classes:

RowSet ,Field, StoredProc, Datamodule, Session, Database, Query.

Features:

DBase has many outstanding features that contribute to its prominence among database management systems and tools, such as:

- A just in time (JIT) compiler, which converts the source language into machine language
- A linker to create DBase applications (.exe files)
- A runtime engine installer for Web servers and machines that need to execute DBase runtime applications
- Preprocessors for reading the program source file and producing preprocessed files as output, which is fed into the compiler
- An integrated development environment with a command window and navigator
- Two-way graphical user interface (GUI) design tools, which possess the ability to switch back and forth between using a GUI design tool and a code editor
- A source code editor, which allows for the manual editing and entry of codes



40. DIMENSIONS 6D AND 7D

Dimension 6D:

Six-dimensional space is any space that has six dimensions, six degrees of freedom, and that needs six pieces of data, or coordinates, to specify a location in this space. There are an infinite number of these, but those of most interest are simpler ones that model some aspect of the environment. Of particular interest is six-dimensional Euclidean space, in which 6-polytopes and the 5-sphere are constructed. Six-dimensional elliptical space and hyperbolic spaces are also studied, with constant positive and negative curvature.

Formally, six-dimensional Euclidean space, is generated by considering all real 6-tuples as 6-vectors in this space. As such it has the properties of all Euclidean spaces, so it is linear, has a metric and a full set of vector operations. In particular the dot product between two 6-vectors is readily defined and can be used to calculate the metric. 6×6 matrices can be used to describe transformations such as rotations that keep the origin fixed.

More generally, any space that can be described locally with six coordinates, not necessarily Euclidean ones, is six-dimensional. One example is the surface of the 6-sphere, S^6 . This constraint reduces the number of coordinates needed to describe a point on the 6-sphere by one, so it has six dimensions. Such non-Euclidean spaces are far more common than Euclidean spaces, and in six dimensions they have far more applications.

Screw theory:

In screw theory angular and linear velocity are combined into one six-dimensional object, called a twist. A similar object called a wrench combines forces and torques in six dimensions. These can be treated as six-dimensional vectors that transform linearly when changing frame of reference.

6-polytope:

A polytope in six dimensions is called a 6-polytope. The most studied are the regular polytopes, of which there are only three in six dimensions: the 6-simplex, 6-cube, and 6-orthoplex. A wider family is the uniform 6-polytopes, constructed from fundamental symmetry domains of reflection, each domain defined by a Coxeter group.

Dimension 7D:

In mathematics, a sequence of n real numbers can be understood as a location in n -dimensional space. When $n = 7$, the set of all such locations is called 7-dimensional space. Often such a space is studied as a vector space, without any notion of distance. Seven-dimensional Euclidean space is seven-dimensional space equipped with a Euclidean metric, which is defined by the dot product.

More generally, the term may refer to a seven-dimensional vector space over any field, such as a seven-dimensional complex vector space, which has 14 real dimensions.

Seven-dimensional spaces have a number of special properties, many of them related to the octonions. An especially distinctive property is that a cross product can be defined only in three or seven dimensions. This is related to Hurwitz's theorem, which prohibits the existence of algebraic structures like the quaternions and octonions in dimensions other than 2, 4, and 8.

7-polytope:

Polytope in seven dimensions is called a 7-polytope. The most studied are the regular polytopes, of which there are only three in seven dimensions: the 7-simplex, 7-cube, and 7-orthoplex. Wider families are the uniform 7-polytopes, constructed from fundamental symmetry domains of reflection, each domain defined by a Coxeter group. Each uniform polytope is defined by a ringed Coxeter-Dynkin diagram. The 7-demicube is a unique polytope from the D_7 family, and 3_{21} , 2_{31} , and 1_{32} polytopes from the E_7 family.

6-sphere:

The 6-sphere or hypersphere in seven-dimensional Euclidean space is the six-dimensional surface equidistant from a point, e.g. the origin. It has symbol S^6 , with formal definition for the 6-sphere with radius r of

$$S^6 = \{x \in \mathbb{R}^7 : \|x\| = r\}.$$

The volume of the space bounded by this 6-sphere is

$$V_7 = \frac{16\pi^3}{105} r^7$$

which is $4.72477 \times r^7$, or 0.0369 of the 7-cube that contains the 6-sphere.

41. DATA DISPLAY DEBUGGER (DDD)

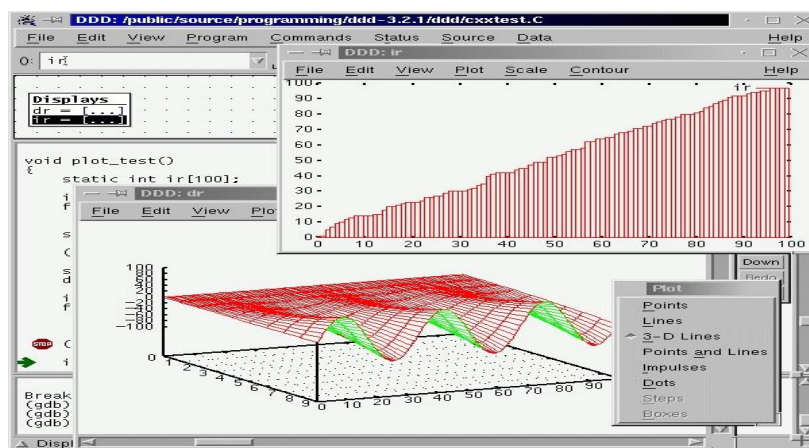
GNU DDD is a graphical front-end for command-line debuggers such as GDB, DBX, WDB, Lade bug, JDB, XDB, the Perl debugger, the bash debugger bash db, the GNU Make debugger remake, or the Python debugger db. Besides “usual” front-end features such as viewing source texts, DDD has become famous through its interactive graphical data display, where data structures are displayed as graphs.

DDD Source:

DDD can be found at /gnu/ddd/ on ftp.gnu.org, on Savannah or at any GNU FTP mirror near you. The ddd/ directory contains the DDD source distribution: ddd-version.tar.gz -- this package is the one you want. It includes the complete DDD source code, building instructions, as well as the DDD manual in Tex info, Info, PostScript, and PDF formats. Here are further instructions on how to download and unpack GNU packages. You can support the principle of software freedom by buying stuff from the FSF shop.

DDD Binaries:

The FSF does not distribute DDD binaries. You can ask for help if you need technical support. DDD binaries for GNU/Linux are typically available via your GNU/Linux distributor.



DDD packages for Debian GNU/Linux are found here.

The written word provides binaries of freely available software for various platforms. Their FTP server contains DDD and XPM packages.

To build DDD from sources, you need

The DDD source distribution (see above). The GNU compiler collection (GCC), version 3.0 or higher (or another ISO C++ compiler). The Less T if user interfaces toolkit, version 0.89 or higher (or another Motif-compatible user interface toolkit). The simplest way to build and install DDD is: Unpack the DDD source distribution Change into the d-version subdirectory. If the above doesn't give an error, type `make install` to install the program. (Depending on your OS and permission level you might need to use `sudo make install` instead.) To run DDD, you need the GNU debugger (GDB), version 4.16 or later (or depending on the program to be debugged, possibly other command-line debuggers such as Lade bug, JDB, XDB, the Perl debugger, the bash debugger `bash db`, the GNU Make debugger `remake`, or the Python debugger `py db`.)

To Get started with DDD:

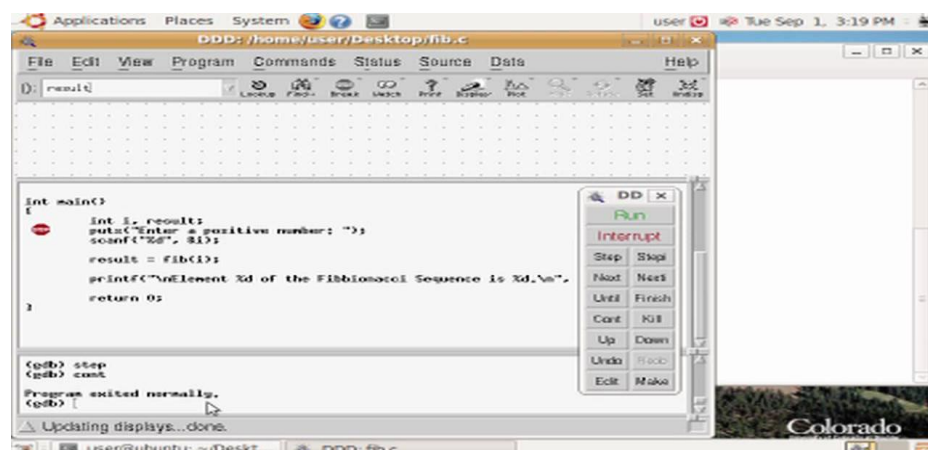
The DDD Manual contains a detailed tutorial .Here are some free third-party tutorials on the Web: There's an article on DDD in Dr. Dobb's Journal. Linux Magazine has articles (in German) on debugging with GDB and DDD. Linux Focus has a DDD tutorial in English, Spanish, German, French, Korean, and Turkish.

The debuggers DDD uses:

As mentioned above, DDD runs a number of debuggers under the scenes. One can issue commands directly to those debuggers. Below are links for these debuggers:

Bash Debugger: `bash db`

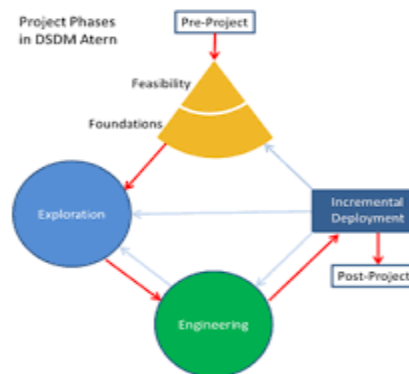
Python Debugger: `py db`



42. DYNAMIC DEBUGGING TECHNIQUE (DDT)

What is Dynamic Debugging Technique?

Dynamic Debugging Technique or DDT, was the name of several debugger programs originally developed for DEC hardware, initially known as DEC Debugging Tape because it was distributed paper tape. The name is a pun on the insecticide (i.e. bug-killer).



Development of DDT:

The first version of DDT was developed at MIT for the PDP-1 computer in 1961, but newer version and newer platforms continued to use the same name.

After being ported to other vendor's platforms and changing media, the name was changed to the less DEC-centric version.

Early version of Digital Research's CP/M and CP/M-86 kept DEC name as DDT (DDT-86 and DDT-68K) for their debugger, now meaning "DYNAMIC DEBUGGING TOOL".

In addition to its normal function as a debugger, DDT was also used as a top-level command shell for the MIT ITS Operating system; on some more recent ITS systems, it is replaced with a "PWORD" which implements a restricted subset of DDT's functionality.. DDT could run and debug up to eight processes at a time and it could run recursively .These eight jobs were all given unique names, and the usual name for the original and top-most DDT was "HACTRN" ("hack-tron").

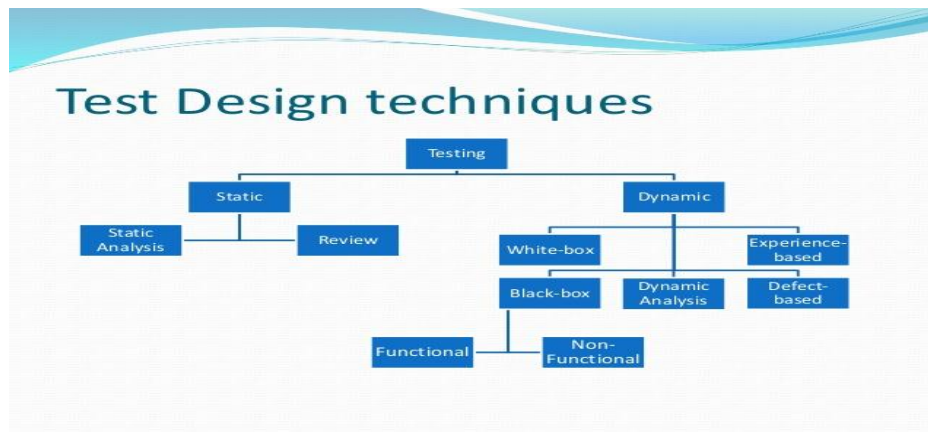
Techniques and Tools commonly used:

In a single board microprocessor, techniques and tools commonly used in dynamic debugging are:

Single Step: These techniques allow executing one instruction at a time and observing the results of each instruction. Generally, this is build using hard-wired logic circuit. As we press the single step run key we will be able to observe the contents of register and memory location. This helps to spot:

- Incorrect addresses
- Incorrect jump location in loops
- Incorrect data or missing codes.

However, if there is large loop then single step debugging can be very tiring and time-consuming. So instead of running the loop n times, we can reduce the number of iteration to check the effectiveness of the loop. The single step technique is very useful for short programs.



Breakpoint:

The breakpoint facility is usually a software routine that allows users to execute a program in sections. The breakpoints can be set using RST instruction. When we push the Execute key, the program will be executed till the breakpoint. The registers can be examined for the expected result. With the breakpoint facility, isolate the segment of program with errors. Then that segment can be debugged using the single-step facility. It is usually used to check:

- Timing loop
- I/O section
- Interrupts.

43. DEAD CODE

Dead code that has no effect on the codes following it no matter how the control flow flows through the program.

That is dead code is that code, that doesn't need to be executed during the course of execution of the program, or in other terms, is useless and dead code are usually removed by the compiler during compilation process as a part of code optimization. Dead code is simpler can be understood as the code that is executed but redundant, either the results were never used or adds nothing to the rest of the program. Wastes CPU performance.

Example:



```
Example of Dead Code
int global;
Void function()
{
    int i;
    i=1;           //dead store//
    global=1;     //dead store//
    global=2;
    return;
    global=3;     //unreachable//
}
```

In the above example, although the division of X by Y is computed and never used, it will throw an exception when a division by zero occurs. Therefore, the removal of the dead code may change the output of the program.

The user can significantly improve a program's quality by removing dead code. While the functionality won't change, it will improve the internal quality - the quality of the source code. This will help in maintenance by decreasing the maintained code size, making it easier to understand the program and preventing bugs from being introduced.

Reasons for dead code:

When requirements for the software have changed or corrections have been made, nobody had time to clean up the old code. Such code could also be found in complex conditionals, when one of the branches becomes unreachable

Types of dead code

Dead procedure or function:

Dead procedures make up the most important part of dead code. They bloat the executables, make systems harder to understand and might even introduce new errors later in the life-cycle of the program. Many compilers include all procedures in the executables regardless of whether they are used or not.



Dead variable:

A dead variable is not read nor written. It is completely useless, only taking up memory and a line or two of code. Dead variables are one problem, but a more significant problem lies in partially used variables. A variable should be both written to and read from.

Dead parameter:

A dead parameter is passed to a procedure but not used by it. Passing parameters takes a little bit of time during each call. Dead parameters can make your program slower, especially if they are in the public interface and require marshaling.

Dead return value:

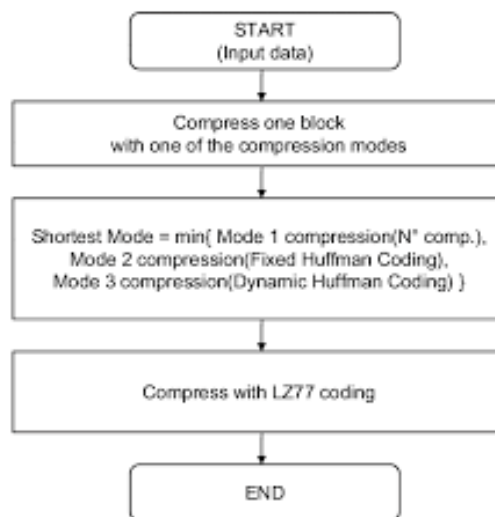
A dead return value of a function is not stored or used by any of the callers.

44. DEFLATE ALGORITHM

Huffman coding is a form of prefix coding, which you may not think you know. But you've almost certainly used a prefix code, when using the phone. Starting from the dial tone, you press a sequence of what may be five, seven, eight, eleven, twelve, or some other number of keys and each sequence of keys reaches another specific phone line.

A Huffman code is a prefix code prepared by a special algorithm. Here, instead of each code being a series of numbers between 0 and 9, each code is a series of bits, either 0 or 1. Instead of each code representing a phone, each code represents an element in a specific “alphabet” (such as the set of ASCII characters, which is the primary but not the only use of Huffman coding in DEFLATE).

A Huffman algorithm starts by assembling the elements of the “alphabet” each one being assigned a “weight” a number that represents its relative frequency within the data to be compressed. These weights may be guessed at beforehand, or they may be measured exactly from passes through the data, or some combination of the two.



In any case, the elements are selected two at a time, the elements with the lowest weights being chosen. The two elements are made to be leaf nodes of a node with two branches (I really hope you know nodes and trees...) Any way, suppose we had a set of elements and weights that looked like this:

- A 16
- B 32
- C 32
- D 8
- E 8

We would pick D and E first, and make them branches of a single node -- one being the '0' branch, and one the '1' branch. At this point, no element has been given its complete code yet, but we now know that the codes for D and E will be exactly the same, except for the last binary digit: D will end in 0 and E in 1.

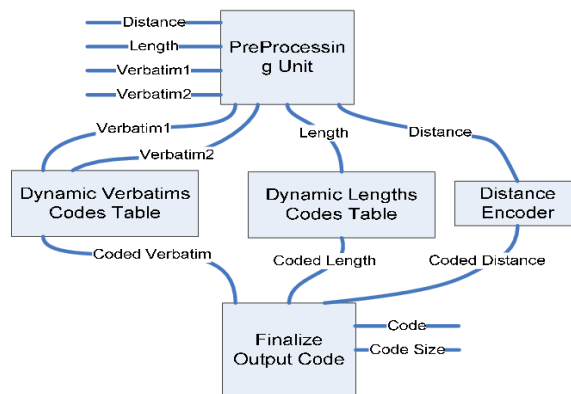


Figure 5. Block diagram of Dynamic Deflate Coder.

The combined node D-and-E is placed back with the other (as yet) uncombined elements, and given a weight equal to the sum of its leaf nodes: in this case, $8 + 8 = 16$. Again, we take the two nodes with lowest weight, which are A, and D-and-E, and join them into a larger node.

This time, when the node A-D-E is put back into the list of elements, all remaining elements have the same weight, 32. Which two of the three are selected to be combined first is not important, at least not in the classical Huffman algorithm.

In the classic Huffman algorithm, a single set of elements and weights could generate multiple trees. In the variation used by the Deflate standard, there are two additional rules: elements that have shorter codes are placed to the left of those with longer codes.

equivalent of the main function of a C program, which is the start of the user written code.

Structuring:

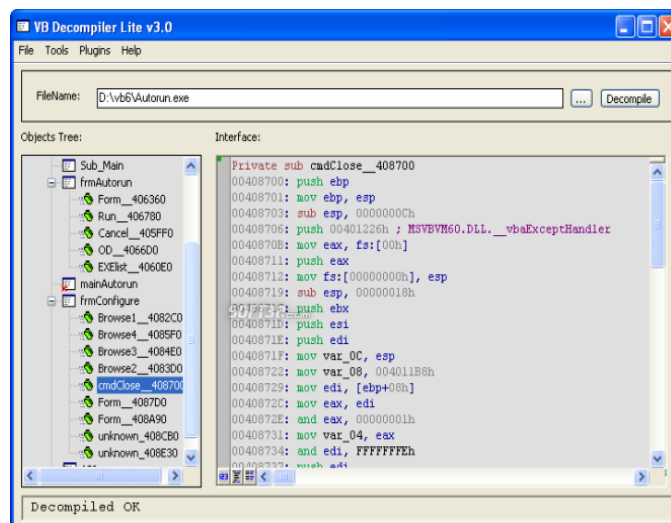
The penultimate decompilation phase involves structuring of the IR into higher level constructs such as while loops and if/then/else conditional statements. For example, the machine code

```
xoreax, eax
10002:
or ebx, ebx
jge 10003
    add eax,[ebx]
    mov ebx,[ebx+0x4]
jmp 10002
10003:
```

mov [0x10040000],eax
could be translated into: `eax = 0;while (ebx< 0) {`

```
eax += ebx->v0000;
ebx = ebx->v0004;
}
v10040000 = eax;
```

Unstructured code is more difficult to translate into structured code than already structured code. Solutions include replicating some code, or adding boolean variables.





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Department*