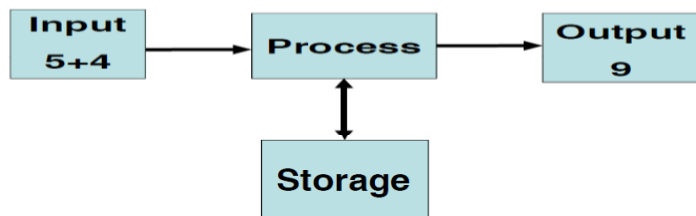


Meeting One



Computer is a machine that can accept data and process it according to a stored program of instructions and then give the result via output devices. An electronic symbol-manipulating system that's designed and organized to automatically accept and store input data, process them, and produce output results under the direction of detailed step-by-step stored program of instructions.

How a computer works can be explained with this simple block diagram:



For example you input any data using input devices, $5 + 4$. Then this data will be processed in a computer. This process will be held by a device called processor. After the process is completed, the result will be held by an output device. Sometimes, the computer needs to save the process for a particular need. For example for further use in the future. In this case the computer will save the process to a device called storage. That's the way computer works.

Task 1

Find the synonym from the passage (Slide 2 - 4) which mean the same as:

1. Keep/save : _____
2. Through : _____
3. Commands : _____
4. Made : _____
5. Arranged : _____
6. Instruments : _____
7. Very definite : _____
8. As stated by : _____
9. Finished : _____
10. Necessity : _____

Now have a look at all devices in that process. First one is **input device**. There are many kinds of input devices. The most commonly used is keyboard. Others are mouse, light pen, microphone, track ball, camera (for example webcam), etc. We can say that input device is any kinds of devices that can be used to input any data to a computer.

The second device is **the processor**. This is the brain of the computer which holds all data processing in a computer. The processor is created based on semiconductor material like Germanium (Ge) and Silicon (Si). The form of processor was not like the form we see the processor nowadays. There are evolution in creating a processor until we get the form of processor today.

For the first time, computer used **vacuum tube**, an electronic device to hold computation. Vacuum tube is in big size. And one computer may consist of tens even hundreds of vacuum tube. That's why it is no wonder if the first generation of computer may have a very big size like a house.

The second generation of computer began with the invention of **transistor** to replace the use of vacuum tube. The effect of this invention is the reduce on the size of computer. The size of transistor may be like a peanut-size. That's why there is a significant reduce in the size of computer.

The next generation is the use of **Integrated Circuit (IC)** to replace transistor. One IC may consist of thousands of transistor. Finally the IC also gets evolution into VLSI which consists of thousands of IC. That's about the processor.

The third device is **output device**. Output device is any device that can produce information as the result of computer process. This information can be displayed in a monitor, or can be listened via speaker, or can be read such as in printing form like paper.

Recently there are two kinds of monitor, the first is CRT monitor which is use electronic tube that's why the size is big. The second is LCD. LCD has slim form since it has flat monitor, the technology that is used also for notebook and laptop.

The last device is **storage**. Actually this device is used to store or save any information from a processor. The most common of storage device are hard disk, flash disk, floppy disk, CDROM (optical disk), magnetic tape, etc.

The use of computer in daily activities

Recently computers are used by people for the following purposes:

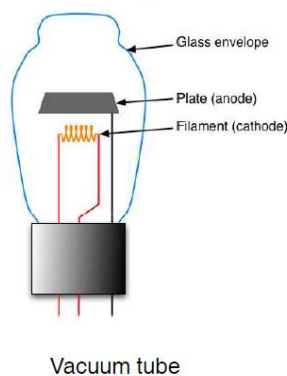
1. **Data Processing.** Computers are used in financial and commercial works such as billing, inventory control, etc.
2. **Scientific Processing.** Computers are used to support science such as nuclear engineering, mathematic, etc.
3. **Multimedia.** Examples in this area are for composing music, creating film animation, editing film and video, etc.

Task 2

Show whether the followings statements are true or false (T/F) from Slide 6 – 11

1. Any kind of instruments that can be used to put any data into a computer is input device.
2. The form of processor is always the same.
3. The first generation computer used many vacuum tubes.
4. Today's processor is using transistor to replace vacuum tubes.
5. CRD technology is not used for notebook.

Computer Terms



Vacuum tube

Is an electronic device that uses glass tube to house electronic circuits.

The working of which are dependent on the vacuum within the tube. Later, this device was replaced by transistor.



ENIAC vacuum tube

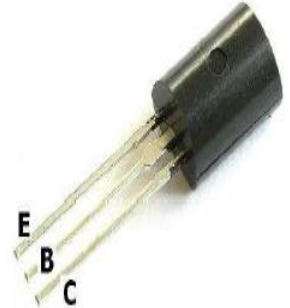
Integrated Circuit

This is the further development of transistor. Consisting hundreds of transistor in each which makes computation faster.



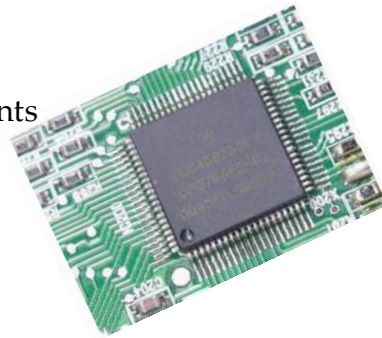
Transistor

Is a semiconductor device used to amplify a signal or open and close a circuit. In digital computers, it functions as an electronic bridge between two wires and allows current to flow. This device was invented by William Shockley, Walter Brattain, and John Bardeen. This device has three feet namely the base, the emitter, and the collector.



VLSI

(Very Large Scale Integration) Is the packing of hundreds of thousands of electronic components on a single semiconductor chip.



Further Reading

- <http://en.wikipedia.org/wiki/Computer>
- http://en.wikipedia.org/wiki/Integrated_circuit
- http://www.google.co.id/search?hl=id&defl=en&q=define:Computer&sa=X&oi=glossary_definition&ct=title
- <http://www.osdata.com/system/physical/basics.htm>
- <http://inventors.about.com/library/blcoindex.htm>

Meeting 2

INSIDE A a Computer

The main part of a computer to handle the process is CPU. It stands for Central Processing Unit. In this place all The process goes on. If we have a deeper look inside this CPU we can see many kind of devices attached to this CPU. On the right is the box of CPU.

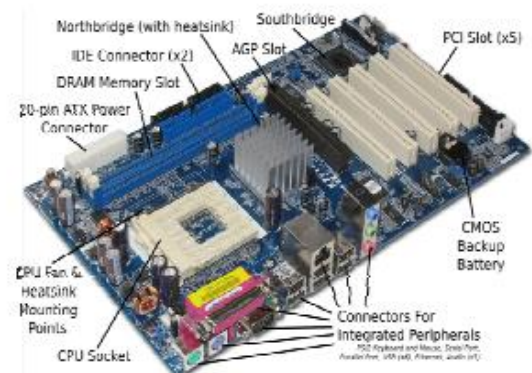


CPU

There are many devices inside the CPU. Some of them are :

1. Motherboard

This is a printed circuit board (PCB) which all card or module is attached. Motherboard is also called with main board, baseboard, system board, or planar board. In Apple computer, it is called logic board.



2. Processor

Processor is a hardware (sometimes software) system to handle operations upon data. For the first time, processor is only a vacuum tube. Then it undergoes an evolution becomes transistor, until it reaches the form of processor as we can see recently.

In personal computers the central processing unit resides in a single chip called a microprocessor. When someone refers to the speed of a computer, the reference is to the CPU and is measured in megahertz (MHz). But today the speed of a processor has reached gigahertz (GHz). Remember the Moore's Law about the speed of computer.

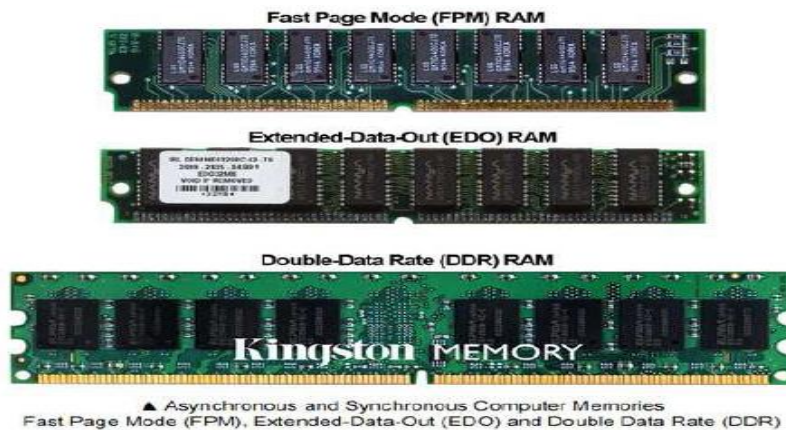
There are many companies produces processor. The main one is Intel. And there are also AMD and IBM. Below is a processor seen from the bottom.



3. Memory (RAM)

In order to handle the computation, especially to access to the most frequent accessed data, a computer needs a memory. In this case is RAM (Random Access Memory). The characteristics of RAM is volatile, meaning that the data that is stored in memory only available while the computer is turn on. That's why you have to save your work before the computer is turn off.

It is a different case with ROM, which stands for Read Only Memory. ROM is non-volatile, meaning that the data is still in ROM even there is no electricity. Below are some pictures of computer.



Task 1

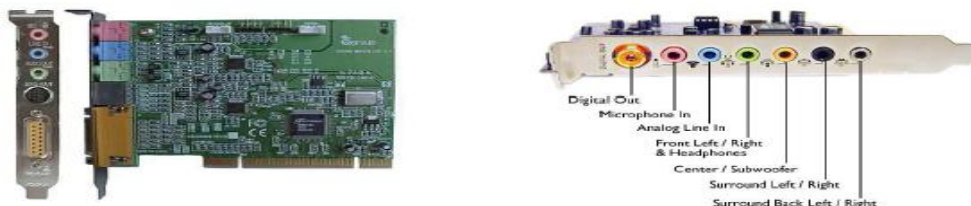
Answer the following questions from Slide 2 - 6.

1. How many names are there for motherboard? Mention!
2. What is the measurement for computer speed?
3. Explain the evolution of processor.
4. What is the characteristic of Ram? Explain.
5. ROM is non-volatile. What does it mean?

d. Sound card

Sound card is also known as audio card. It converts audio signals from a microphone, audio tape, or some other sources to digital signals, which can be stored as a computer audio file. Sound cards also convert computer audio files to electrical signals, which you can play through a speaker or a headphone. The microphone and the speakers or the headphones connect to the sound card.

sound card with the ports.



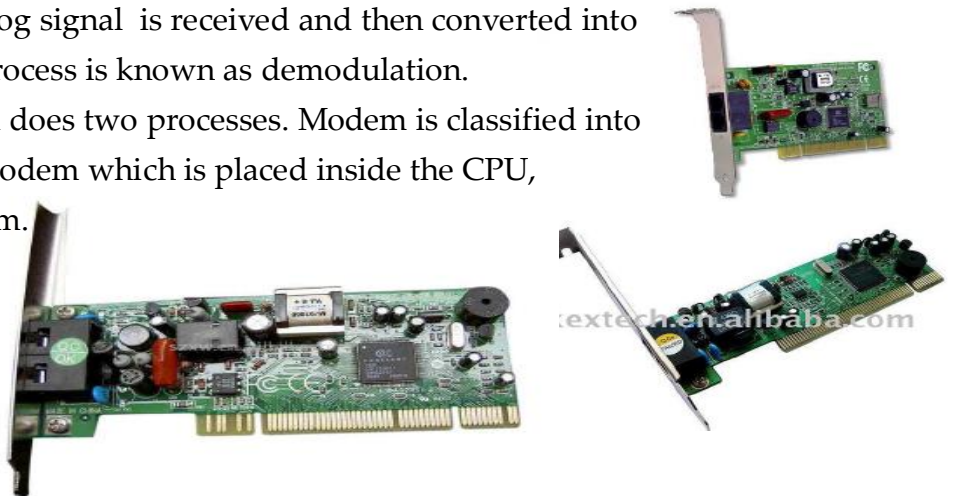
e. VGA card

VGA stands for Video Graphic Array. This is a device to handle signal displayed on to monitor.



f. Internal Modem

Modem stands for modulator and demodulator. The function is to connect a computer to the Internet. Modem will transfer a digital signal from a computer into analog signal. This process is called modulation. There is **internal modem** reverse process in the opposite computer, the receiver. In this computer, the receiver, the analog signal is received and then converted into digital signal. This process is known as demodulation. That's why a modem does two processes. Modem is classified into two kinds. Internal modem which is placed inside the CPU, called internal modem.



Above is a picture of 56kbps Conexant Internal modem. This modem is identified by the chip where the company creates. Conexant means the chip is produced by Conexant

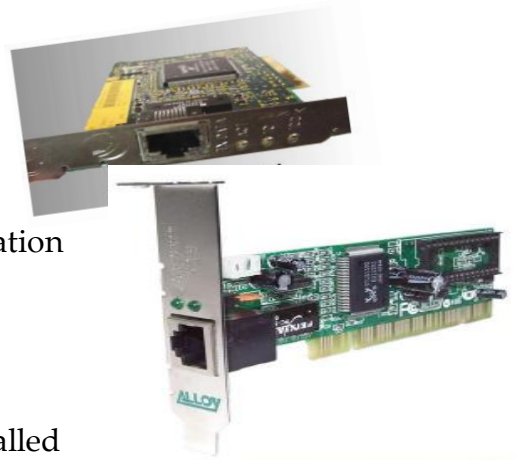
The data transfer from a modem into the internet or from the Internet into a modem is called the speed of a modem. And it is measured by kbps, means 'kilo bit per second'. The other kind of modem is external modem which is placed outside the CPU. Look at the picture on the right.



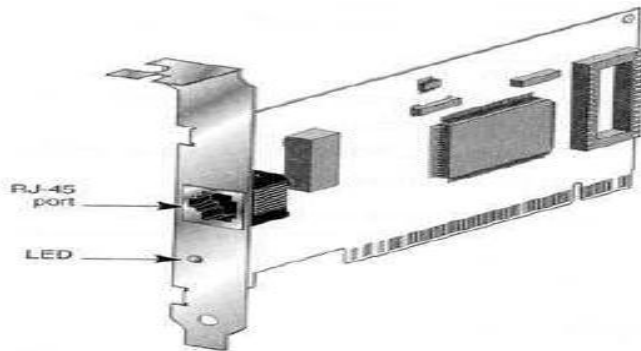
g. Network Interface Card

Network Interface Card or NIC forshorts.

Also known as LAN card. It allows the computer to be connected to other computers so that information can be exchanged between them.



NIC can be identified easily. It has a special port called RJ-45. RJ means Registered Jack. And also a led to indicate a data is being transferred.



Above NIC is connected to other computer using a cable (wire).

Fortunately, the world is changing. Due to inefficiency of using cables, people try not to use cable. This method is called wireless, means without cable/wire. The pictures below are LAN Cards without the need to connect using cable. It is known as WLAN, Wave LAN, since it uses wave as a media to transfer data.



Task 2 (Slide 8 – 15)

What do these abbreviations stand for?

1. PCB
2. PCI
3. WLAN
4. LAN
5. Kbps

Complete the following sentence.

6. A sound card can ... and
7. A modem is used to
8. A LAN Card is for

FURTHER READINGS

- <http://resources.kaboose.com/brain/comples2.html>
 - <http://computer.howstuffworks.com/pc.htm>
 - http://www.kids-online.net/learn/c_n_1.html
 - <http://en.wikipedia.org>
 - <http://www.ied.edu.hk/has/comp/compnent/index.htm>
 - http://www.microcenter.com/multimedia/Computer_Components_Low/intro_lowband.htm
-

Meeting 3



What is Software?

Software is a term to describe a set of computer programs that perform a collection of tasks. Software is also a series of instructions for the computer that performs a particular task. According to Wikipedia, the term software was first used by John W. Tukey in 1958. Software is divided into some categories. Two major of them are **application software** and **system software**.

Name for any software or computer program. Most of the computer software excludes system software is application software. Application software allows enduser to accomplish one or more specific (non-related) computer tasks. Some examples for application software is word processor such as Microsoft Word 2007, Open Office Writer, etc.

System software is any computer software which manages and controls computer hardware so that application software can perform a task. System software will handle and control all operation process in computer. For example when someone boots the computer up, the system software will perform all operations until the computer is ready for user. The most important system software is operating system.

What is Operating System?

An 'operating system' (commonly abbreviated OS and O/S) is the software component of a computer system that is responsible for the management and coordination of activities and the sharing of the resources of the computer. The operating system acts as a host for applications that are run on the machine. As a host, one of the purposes of an operating system is to handle the details of the operation of the hardware. This relieves application programs from having to manage these details and makes it easier to write applications.

Almost all computers, including handheld computers, desktop computers, supercomputers, and even video game consoles, use an operating system of some type. Some of the oldest models may however use an embedded operating system, that may be contained on a compact disk or other data storage device.

Task 1

Show whether the followings statements are true or false (T/F) from Slide 2 - 6.

1. Software is also a series of constructions for the computer that performs a particular task.
2. Most computer software but system software is application software.
3. System software is any computer software which manages and controls both computer hardware and application software.
4. Software is a computer program.
5. Word processor such as Microsoft Word 2007, Open Office Writer is a system software

Types of Operating System

There are many kinds of operating system. The most popular one is Windows from Microsoft Corporation. Microsoft first introduced an operating environment named Windows in November 1985 as an add-on to MS-DOS in response to the growing interest in graphical user interfaces (GUIs).



Other operating system is *Mac OS*. Mac OS is the trademarked name for a series of graphical user interface-based operating systems developed by Apple Inc. (formerly Apple Computer, Inc.) for their Macintosh line of computer systems. The Macintosh user experience is credited with popularizing the graphical user interface.

The original form of what Apple would later name the "*Mac OS*" was the integral and unnamed system software first introduced in 1984 with the original Macintosh, usually referred to simply as the System software.

Recently, there is also an operating system which has open source license. The most popular one is Linux. Linux is a Unix-like computer operating system family which uses the Linux kernel. Linux is one of the most prominent examples of free software and open source development; typically all the underlying source code can be freely modified, used, and redistributed by anyone. For the first time Linux kernel is created by Linus Torvalds.

Nowadays, Linux has abundant variant called distributions. Below are some of Linux distributions in ranking per October 2008 (you may refer to <http://www.distrowatch.com>) : Ubuntu, openSUSE, Mint, Fedora, PCLinuxOS, Debian, Mandriva, and more. Ubuntu has been the most popular Linux distributions for the last few years, since it has unique feature that most people need. The feature is 'live CD' which is enable someone to try Ubuntu from Ubuntu CD without installing Ubuntu on to harddisk. You may request Ubuntu CD for free at <http://shipit.ubuntu.com>.



Task 2

Match the terms with the definition!

1. Computer Task
2. Boot the computer up
3. Host
4. Handheld computer
5. Desktop computer
6. Supercomputer
7. Video game console
8. GUI
9. CLI

Here are the Definition

- A. Turn the computer on
- B. a machine specified for playing game, such as Play station, Nintendo, Xbox, etc
- C. a computer that is used on a desk
- D. Central
- E. Graphical User Interface. It is an interface for user using graphical mode. In this mode user can give a command to a computer by activating a mouse pointer. For example clicking a button Save to save a document.
- F. Something that a computer has to do.
- G. Command Line Interface. It is the opposite meaning of GUI. In CLI mode user can give a command to a computer by typing a command. It works on DOS era. For example when a user try to delete a file, he has to type a command: Del a_file_name.txt.
- H. a computer to handle heavy computation
- I. a computer that easy to carry

FURTHER READINGS

- <http://shipit.ubuntu.com>
- http://en.wikipedia.org/wiki/Computer_software
- http://en.wikipedia.org/wiki/Application_software
- http://en.wikipedia.org/wiki/Operating_system
- [http://en.wikipedia.org/wiki/Solaris_\(operating_system\)](http://en.wikipedia.org/wiki/Solaris_(operating_system))
- <http://en.wikipedia.org/wiki/Linux>
- http://en.wikipedia.org/wiki/Microsoft_Windows
- http://en.wikipedia.org/wiki/Mac_OS
- <http://www.distrowatch.com>

Meeting 4



A Software is Created by Programming

A set of computer consists of metal, plastic, and other physical devices which is called hardware. This hardware is no use without software. Software is a term to describe a set of computer programs that perform a collection of tasks. Software is also a series of instructions for the computer that performs a particular task.

Software is created by a process called programming or computer programming. This process can also be called by coding which is a process of writing, testing, debugging, and maintain a source code of computer programs.

In programming process, a programmer (a person who writes computer program) must write all code in a text editor with no error at all. He has to write from first line until last line of code. All of the code from first line until last line is called source code. This is the actual form of computer instructions which give a computer an instruction of what to do.

After that, a programmer must compile the source code. A tool to compile is a compiler. This process is called compilation, that is transforming a source code into binary file like executable file. Mostly, a programmer will face error during compilation and the source code cannot be transformed into binary file. So a programmer will look for the error and fix it.

This action is called debugging, that is finding and fixing error code in all of the source code. A tool for debugging is called debugger. The action of compilation and debugging will repeat and repeat, again and again until there is no error at all in the source code.

If we resume the above process would be like this:

- a. Step one: Writing a code
- b. Step two: Compilation
- c. Step three: Debugging
- d. Step four: The result is binary file

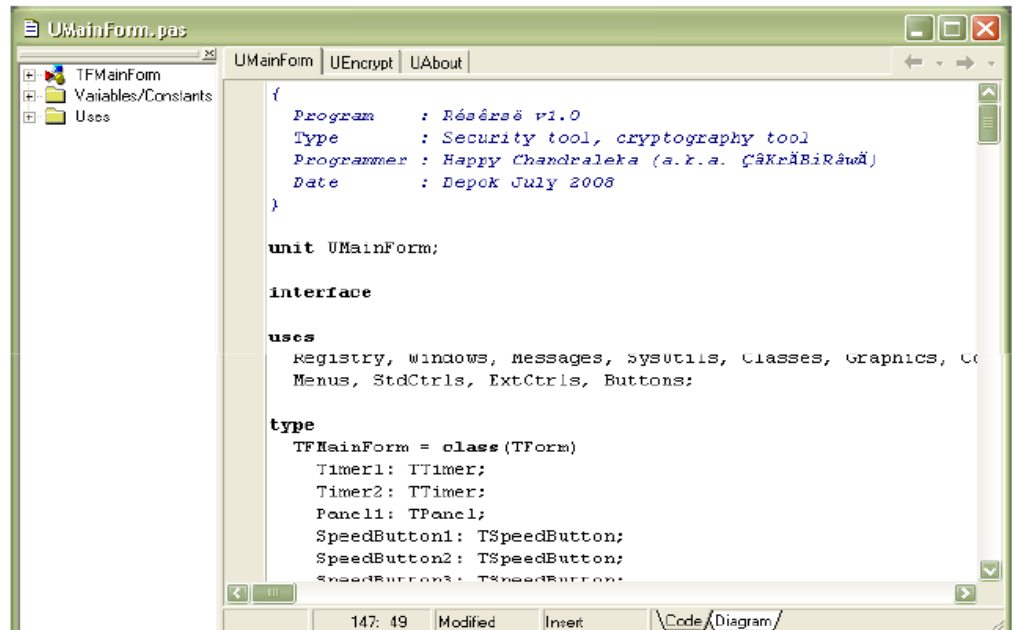
For the first time in computer programming, text editor, compiler, and debugger, are separated one another. But in advanced era of computer programming, those tools are integrated. So a programmer will be more comfortable and easier in creating a program.

Below are a picture of Borland Delphi 7, an integrated tool for programming.

Task 1

Find the synonym from the passage (Slide 2 – 5) which mean the same as :

1. Mistake
2. Collection
3. Changing completely
4. Do
5. Instrument/device
6. The most modern
7. Pleasant
8. Search
9. Summarize
10. Coding



```
UMainForm.pas
TFMainForm
Variables/Constants
Uses

{
  Program      : Résérsé v1.0
  Type        : Security tool, cryptography tool
  Programmer   : Happy Chandraleka (a.k.a. ÇâKràBîRâwâ)
  Date        : Depok July 2008
}

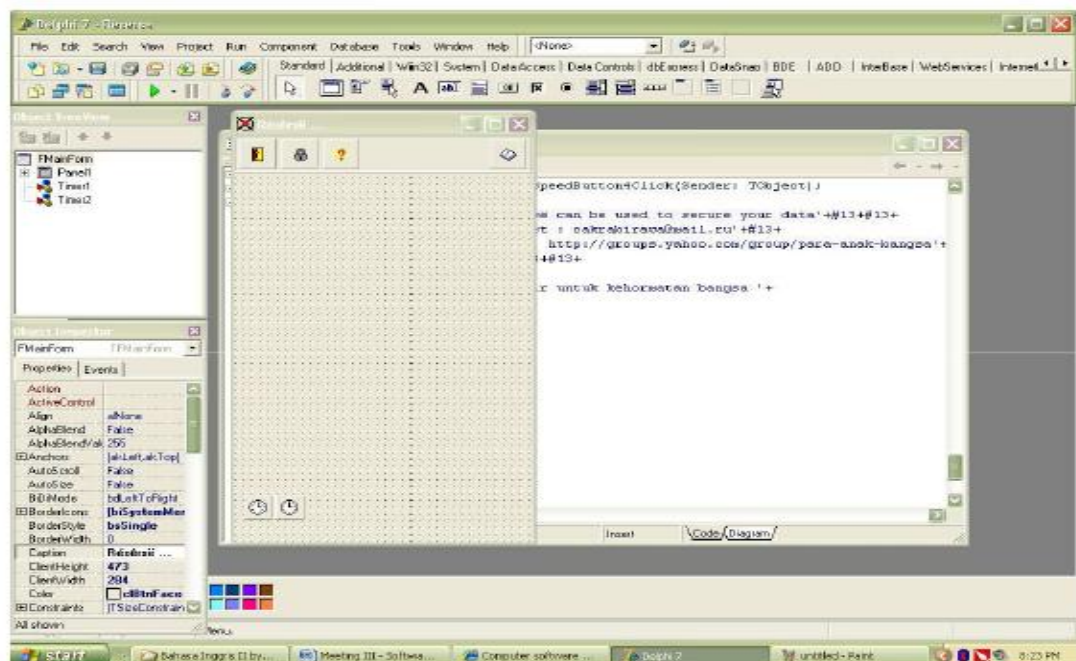
unit UMainForm;

interface

uses
  Registry, Windows, Messages, SysUtils, Classes, Graphics, Co
Menus, StdCtrls, ExtCtrls, Buttons;

type
  TFMainForm = class(TForm)
    Timer1: TTimer;
    Timer2: TTimer;
    Panel1: TPanel;
    SpeedButton1: TSpeedButton;
    SpeedButton2: TSpeedButton;
    SpeedButton3: TSpeedButton;
  end;
end;
```

A picture of computer source code in Delphi language



A picture about an integrated

tool for programming

Kinds of Programming Language

1. Pascal from Borland
2. Borland Delphi from Borland
3. BASIC from Microsoft
4. Microsoft Visual Basic from Microsoft
5. FoxPro
6. Java from Sun Microsystem
7. Phyton
8. C / C++
9. PROLOG
- 10.FORTRAN
- 11.COBOl
- 12.Assembler, etc.



Picture. Splash screen of Borland Delphi 8

Task 2

Match the terms with the definition.

1. Programmer =
2. Debugger =
3. Coding =
4. Compiler =

The definitions

- a. a tool to compile a source code into binary file
- b. a person who creates and writes a program.
- c. a tool to find and fix an error code in a source code
- d. programming = computer programming

FURTHER READINGS

- <http://en.wikipedia.org/wiki/Programming>
- <http://en.wikipedia.org/wiki/Software>
- http://programming.wikia.com/wiki/Main_Page
- http://en.wikipedia.org/wiki/List_of_basic_computer_programming_topics
- http://en.wikipedia.org/wiki/Software_engineering

Meeting 5



In computer world, there is also a software which is created to do something bad and to perform criminal intension. This kind of software is called malicious software or malware. Malicious software can be divided into some categories:

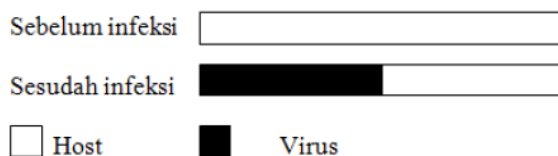
- a. Virus
- b. Worm
- c. Trojan Horse
- d. Logic bomb
- e. Time bomb
- f. Malicious code, etc

But the most important categories are virus, worm, and Trojan horse. All of them can be identified by their replication.

VIRUS

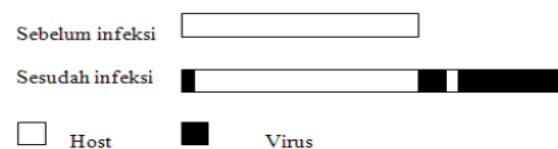
Virus is a software that can replicate by injecting or infecting its own code into other file. By its way to infect other file, virus can be divided into three categories:

a. Overwriting



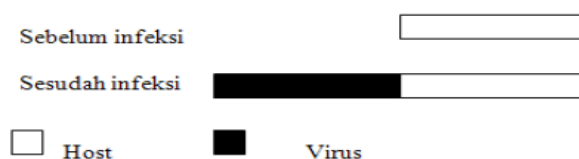
Gambar 1. *Overwriting virus*

b. Appending



Gambar 2. *Appending Virus*

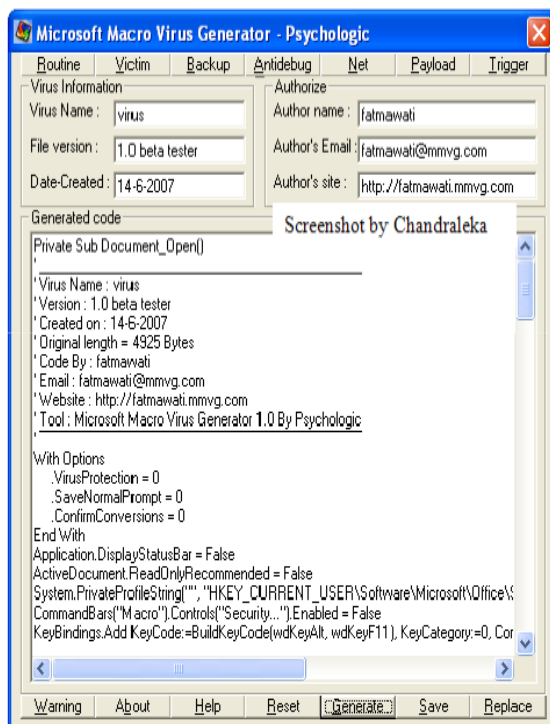
c. Prepending



Gambar 3. *Prepending Virus*

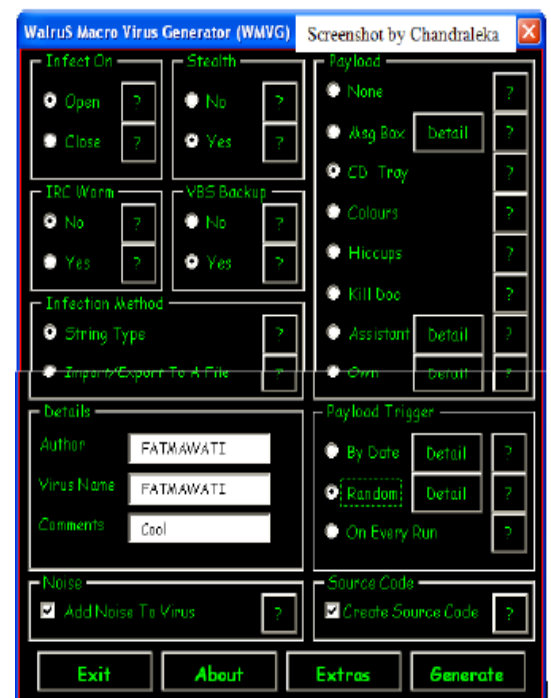
Virus can be created using programming language since virus is actually a program. Anybody can write a program and run it. But the important point in programming a virus is a code for replicating a virus.

Other way in creating a virus is using a tool. This is the simplest and easiest way in creating a virus. This kind of tool is called virus generator or virus creator, or virus kit, or virus constructor, etc. You can search this tool using Google with those keywords. Using virus generator, anybody without any programming skill can create a virus, even if he is a new comer in computer world!



On the left is a picture about virus generator called Microsoft Macro Virus Generator.

Below is a virus generator called Walrus Macro Virus Generator. As you can see in the picture, the way to create a virus using virus generator is just selecting some options and then hit the button **Generate**. A new virus is ready for you, just as instant as creating instant noodles.

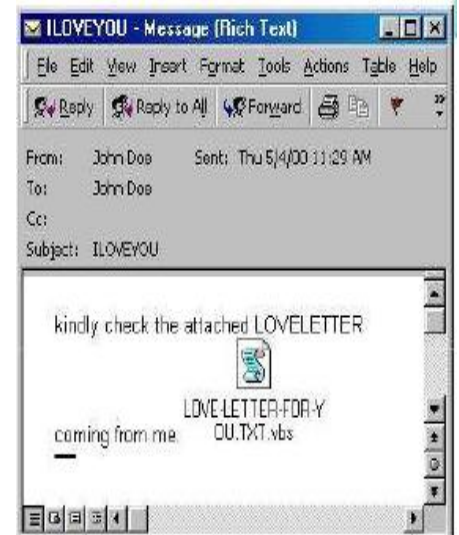


b. WORM

Worm is also a kind of malicious software. It is different from virus which is worm can not inject or infect other files. A worm is a software which replicates by creating its own copy. And without infecting other files.

Worm actually spreads through a network or the Internet using email. Below is a sample of worm called I Love You. Worm I Love You spreads through the Internet as an email attachment. Pay attention at the attachment LOVE LETTER-FOR-YOU.TXT.Vbs.

Usually worm will do something tricky to cheat email receiver. The first is using double file extension. At the left sample, worm I Love You uses two extensions, those are TXT.VBS. The second trick is using social engineering. At the above sample, the worm uses a name "I LOVE YOU" which might interest every email receiver. Who doesn't need love? So, the effect of these tricks is anybody –the email receiver– will click that attachment which is actually a worm code.



Task 1

(From Slide 2 – 9) What do the followings refer to (replace)?

1. Slide 2, line 13: *Them* _____
2. Slide 3, line 2: *its* _____
3. Slide 5, line 3: *it* _____
4. Slide 5, line 7: *This* _____
5. Slide 5, line 13: *he* _____
6. Slide 8, line 2: *It* _____

c. TROJAN HORSE

Trojan horse is derived from ancient Greek. Trojan Horse is a program that looks like a good program but actually contains destructive code or destructive feature. Trojan horse is different from virus and worm, trojan horse can not replicate and cannot infect other files.

There are many kinds of trojan horse. Below are some of them:

- | | |
|----------------------|------------------------------|
| a. Password stealer | d. Keylogger |
| b. Fake Program | e. Anonymous emailer |
| c. Remote monitoring | f. Remote administrator, etc |

Below are some examples of Trojan horse

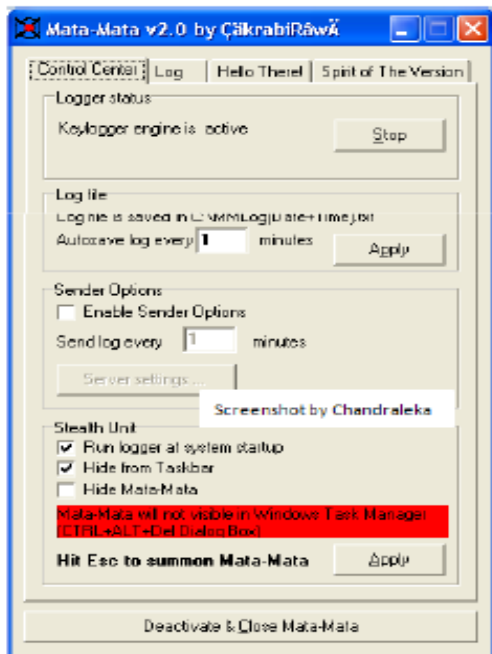
1. Back Orifice created by a group called CDC
2. Mata-Mata created by ÇäkraBîRâwÄ
3. SubSeven created by Mobman
4. NetBus created by Carl Fredrik Neikter
5. Deep Throat created by DarkLIGHT
6. Barok created by Onel de Guzman

Client Trojan Back Orifice



Left is a picture of trojan hose Back Orifice.

Below is a picture of Mata-Mata trojan hose.
This is a sample trojan of keylogging tool.



Below is a picture of Sub Seven.

Client SubSeven 2.2.0



Task 2

Match each definition with the correct term!

1. ___ is a tool for creating a virus instantly.
2. ___ is a program designed for stealing password.
3. ___ is a program designed to record all keyboard keystroke into a log file.
4. ___ is a program imitating a real program but it has destructive features that makes fun for the creator.
5. ___ is a program for sending email without known its sender (anonymous).
6. ___ is a program that can control other computer remotely.
7. ___ is a program that can monitor other computer remotely.

Here are the terms.

- a. Fake program
- b. Virus generator
- c. Remote administrator
- d. Password stealer
- e. Remote monitoring
- f. Keylogger
- g. Anonymous emailer

FURTHER READINGS

- http://id.wikipedia.org/wiki/Virus_komputer
- http://en.wikipedia.org/wiki/Computer_virus
- <http://www.microsoft.com/protect/computer/basics/virus.msp>
- http://compnetworking.about.com/cs/worldwideweb/g/bldef_worm.htm
- <http://www.tech-faq.com/computer-worm-virus.shtml>
- http://en.wikipedia.org/wiki/Computer_worm
- <http://www.icir.org/vern/papers/taxonomy.pdf>
- <http://www.howstuffworks.com/virus.htm>
- [http://en.wikipedia.org/wiki/Trojan_horse_\(computing\)](http://en.wikipedia.org/wiki/Trojan_horse_(computing))
- <http://www.webopedia.com/DidYouKnow/Internet/2004/virus.asp>
- http://y2u.co.uk/Knowledge_Information/Technology/RN_Computer_Trojan_Horses_A1.htm
- http://id.wikipedia.org/wiki/Trojan_horse



Hardware is physical equipment of computer system. Hardware can be divided into two categories: Input Device and Output Device

INPUT DEVICE

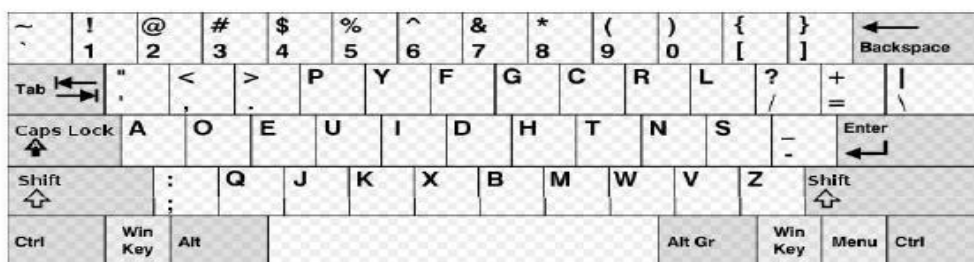
Input device is computer device that is used to input data into computer system. Input device can be divided into some categories:

1. Text input devices

Such as **keyboard**, a device to input text and characters by depressing buttons (referred to as keys), similar to a typewriter. The most common English-language key layout is the QWERTY layout. Below is a picture of a keyboard using QWERTY Layout.



Other alternative layout is DVORAK layout as seen in this picture.



Other alternatives keyboard layout is QWERTZ layout which is used in Germany and much of Central Europe, and AZERTY layout which is used France, Belgium, and some neighbouring countries.

2. Pointing devices

The most common pointing device is **mouse**. In computing, a mouse (plural mice or mouse devices) is a pointing device that functions by detecting two dimensional motion relative to its supporting surface. Physically, a mouse consists of an object held under one of the user's hands, with one or more buttons, other elements, such as "wheels", or extra buttons.



The mouse's motion is typically translated into the motion of a pointer on a display, which allows for fine control of a Graphical User Interface. Here is a picture of a modern mouse.

Other alternative of pointing device is **trackball**, a pointing device consisting of an exposed protruding ball housed in a socket that detects rotation about two axes. The trackball was invented by Tom Cranston and Fred Longstaff as part of the Royal Canadian Navy's DATAR system in 1952[1], eleven years before the mouse was invented. Below is a picture of a trackball.



3. Gaming devices

One example of gaming device is a **joystick**. A joystick is a general control device that consists of a handheld stick that pivots around one end, to detect angles in two or three dimensions.



4. Image, Video input devices

There are two common input devices in this type. First is **Image scanner**, a device that provides input by analyzing images, printed text, handwriting, or an object. Below is a picture of image scanner.



Second type is a **webcam**. Webcams are video capturing devices connected to computers or computer networks, often using USB or, if they connect to networks, ethernet or Wi-Fi. They are well-known for their low manufacturing costs and flexible applications. Below is a picture of a webcam.



5. Audio input devices

One example of audio input device is a **microphone**. Microphone sometimes referred to as a mic or mike, is an acoustic-to-electric transducer or sensor that converts sound into an electrical signal. Microphones are used in many applications such as telephones, tape recorders, hearing aids, motion picture production, live and recorded audio engineering, in radio and television broadcasting and in computers for recording voice, VoIP, and for non-acoustic purposes such as ultrasonic checking.

Task 1

Answer the following questions based on slide 2 – 10.

1. What are the categories of hardware?
2. How many types of input device are there? Mention.
3. What is the function of a scanner?
4. Where is QWERTZ keyboard layout used?
5. How does a microphone work?
6. Why is webcam well-known?

OUTPUT DEVICE

1. Image, Video Output Devices

First example is a **printer**. In computing, a printer is a peripheral which produces a hard copy (permanent human-readable text and/or graphics) of documents stored in electronic form, usually on physical print media such as paper or transparencies. Many printers are primarily used as local peripherals, and are attached by a printer cable or, in most newer printers, a USB cable to a computer which serves as a document source.

Some printers, commonly known as network printers, have built-in network interfaces (typically wireless or Ethernet), and can serve as a hardcopy device for any user on the network. Individual printers are often designed to support both local and network connected users at the same time.

Second Example is a **monitor**. A visual display unit, often called simply a monitor or display, is a piece of electrical equipment which displays images generated from the video output of devices such as computers, without producing a permanent record.

2. Audio Output Devices

Speakers. Computer speakers, or multimedia speakers, are external speakers, commonly equipped with a low-power internal amplifier.

Headsets. Headphones are a pair of small loudspeakers, or less commonly a single speaker, with a way of holding them close to a user's ears and a means of connecting them to a signal source such as an audio amplifier, radio or CD player. They are also known as earphones, ear buds, stereo phones, headsets or, informally cans. In the context of telecommunication, the term headset is used to describe a combination of headphone and microphone used for two-way communication, for example with a telephone.

Task 2

Find the synonym of these words or phrases in the text of slide 12-14.

1. Lasting _____
2. Fasten _____
3. Familiar _____
4. Shows _____
5. Origin _____
6. Utilized _____
7. Instance _____
8. Wire _____
9. Joining _____
10. Picture _____

Computer terms:

- Hardcopy device is a device to print onto a permanent device such as a paper.
- Flexible application is an application that is easy to use.
- Feature is additional tool to handle a function.

FURTHER READINGS

- http://en.wikipedia.org/wiki/Computer_hardware#Input
- <http://en.wikipedia.org/wiki/Trackball>
- <http://en.wikipedia.org/wiki/Joystick>
- <http://en.wikipedia.org/wiki/Gamepad>
- http://en.wikipedia.org/wiki/Game_controller
- http://en.wikipedia.org/wiki/Image_scanner



Definition of computer networks

A computer network is a group of interconnected computers. Networks may be classified according to a wide variety of characteristics. The benefit of a computer network are: Sharing hardware resources easily and Sharing information easily.

A network is a collection of computers connected to each other. The network allows computers to communicate with each other and share resources and information. The Advanced Research Projects Agency (ARPA) designed "Advanced Research Projects Agency Network" (ARPANET) for the United States Department of Defense. It was the first computer network in the world in late 1960's and early 1970's.

Types of computer networks

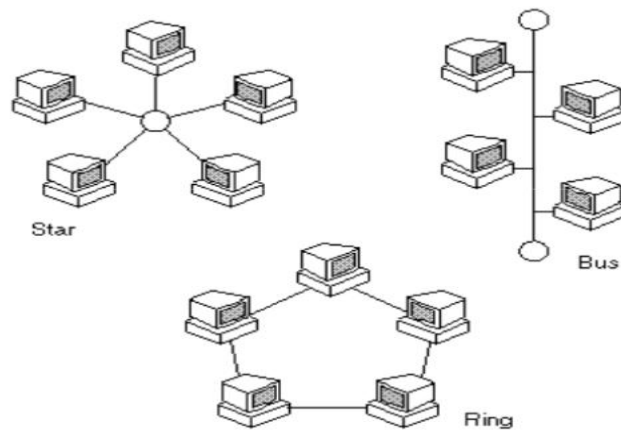
1. **Local-area networks (LANs):** The computers are geographically close together (that is, in the same building).
2. **Wide-area networks (WANs):** The computers are farther apart and are connected by telephone lines or radio waves.
3. **Campus-area networks (CANs):** The computers are within a limited geographic area, such as a campus or military base.
4. **Metropolitan-area networks (MANs):** A data network designed for a town or city.
5. **Home-area networks (HANs):** A network contained within a user's home that connects a person's digital devices.

The following characteristics are used to categorize different types of networks:

1. **topology:** The geometric arrangement of a computer system. Common topologies include a **bus**, **star**, and ring.
2. **protocol:** The protocol defines a common set of rules and signals that computers on the network use to communicate. Two of the most popular protocols for LANs is called Ethernet and the IBM token-ring network.
3. **architecture:** Networks can be broadly classified as using either a peer-to-peer or client/server architecture.

Computers on a network are sometimes called nodes. Computers and devices that allocate resources for a network are called servers

Networks Topology

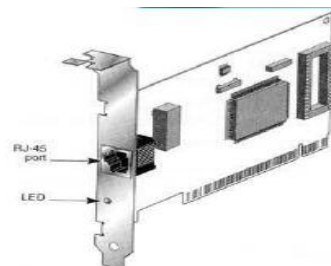


What do we need to create a computer network?

There are many kinds of devices to create a computer network. For a basic computer network we would need:

1. Network Interface Cards

A network card, network adapter or NIC (network interface card) is a piece of computer hardware designed to allow computers to communicate over a computer network



NIC can be identified easily. It has a special port called RJ-45. RJ means Registered Jack. And also a led to indicate a data is being transferred.

2. Repeaters

A repeater is an electronic device that receives a signal and retransmits it at a higher power level, or to the other side of an obstruction, so that the signal can cover longer distances without degradation.

3. Hub

A hub contains multiple ports. When a packet arrives at one port, it is copied to all the ports of the hub for transmission. When the packets are copied, the destination address in the frame does not change to a broadcast address. Below is a picture of 4-port Ethernet hub.



Above is a network switch

Task 1

Which words in the slides have the opposite meaning to the following?

1. Narrow
2. Disadvantage
3. Hard/difficult
4. The last
5. Few
6. Sends
7. Single port
8. Above
9. Disconnected
10. Shorter

Task 2

Answer these questions based on slide 2-5.

1. What is meant by a network?
2. What are the advantages of a network?
3. How do we create a basic network?
4. Who create the first network?
5. How to categorize different types of networks?

COMPUTER TERMS

- Network is a set of items connected together into one unit
- Port in a hub or switch is a slot to connect a hub or switch to other network device

FURTHER READINGS

- http://en.wikipedia.org/wiki/Computer_networks
- http://en.wikipedia.org/wiki/Network_hub
- <http://en.wikipedia.org/wiki/Repeater>
- <http://www.webopedia.com/TERM/N/network.html>
- <http://www.uaf.edu/toolik/Reports/Report03/CommsSlides-SRI.ppt>
- http://www.cs.ucr.edu/~weesan/cs6/03_basic_computer_network.ppt



What is steganography

Steganography is the art and science of writing hidden messages in such a way that no-one apart from the sender and intended recipient even realizes there is a hidden message, a form of security through obscurity. By contrast, cryptography obscures the meaning of a message, but it does not conceal the fact that there is a message.

Generally, a steganographic message will appear to be something else : a picture, an article, a shopping list, or some other message. This apparent message is the covert text. For instance, a message may be hidden by using invisible ink between the visible lines of innocuous documents.

The advantage of steganography over cryptography alone is that messages do not attract attention to themselves, to messengers, or to recipients. An unhidden coded message, no matter how unbreakable it is, will arouse suspicion and may in itself be incriminating, as in countries where encryption is illegal. Often, steganography and cryptography are used together to ensure security of the covered message. Someone who is expert in steganography is called steganalyst.

History of steganography

The word steganography is of Greek origin and means "covered, or hidden writing". Its ancient origins can be traced back to 440 BC. Herodotus mentions two examples of steganography in *The Histories of Herodotus*. Demaratus sent a warning about a forthcoming attack to Greece by writing it on a wooden panel and covering it in wax. Wax tablets were in common use then as re-usable writing surfaces, sometimes used for shorthand.

Another ancient example is that of Histiaeus, who shaved the head of his most trusted slave and tattooed a message on it. After his hair had grown the message was hidden. The purpose was to instigate a revolt against the Persians.

Task 1

Check your understanding.

1. What is steganography for?
2. What is covertext?
3. Why is steganography better than cryptography?
4. Who sent a warning to Greece by using steganography?
5. How did Histiaeus apply the steganography technique?

Some Techniques of Steganography

1. Writing a secret message using invisible ink.
2. Hidden messages on messenger's body: also in ancient Greece. Herodotus tells the story of a message tattooed on a slave's shaved head, hidden by the growth of his hair, and exposed by shaving his head again.
The message allegedly carried a warning to Greece about Persian invasion plans.

This method has obvious drawbacks :

- a. It is impossible to send a message as quickly as the slave can travel, because it takes months to grow hair.
 - b. A slave can only be used once for this purpose. (This is why slaves were used: they were considered expendable).
3. A picture of a message in microdots or microfilms.
 4. In computer era, steganography can be done by inserting a secret document into other document. Any document can be used as a media, for example text file, picture file, or multimedia file such as mp3 or video file.

Practice

- Prepare an image for cover image.
- Prepare a secret image to be hidden.
- Go to this site <http://incoherency.co.uk/hideimage.php>
- Hit button Go!

Task 2

Find the term in the passage which have meaning of the following (Slide 7-9).

1. Colored liquid material that is hidden or cannot be seen.
2. So very old
3. Removing hair or beard
4. Must not be known by others
5. A person who is owned by and must served someone
6. A tiny sized dot
7. Coming to conquest or rule
8. Disadvantage

COMPUTER TERMS

- Cover text = a text or a messages that is displayed to a user
- Encryption = a process converting plain text into cipher text

FURTHER READINGS

- ◇ http://www.dmoz.org/Computers/Security/Products_and_Tools/Cryptography/Steganography/
- ◇ http://petitcolas.net/fabien/steganography/image_downgrading/index.html
- ◇ http://www.fbi.gov/hq/lab/fsc/backissu/july2004/research/2004_03_research01.htm
- ◇ <http://www.jjtc.com/Steganography>
- ◇ <http://www.citi.umich.edu/techreports/reports/citi-tr-01-11.pdf>
- ◇ <http://www.spy-hunter.com/stego.html>
- ◇ <http://www.datahide.com/BPCSe/Articles/Ref-6.SPIE98.pdf>
- ◇ <http://blog.maxant.co.uk/pebble/2007/07/19/1184876280000.html>



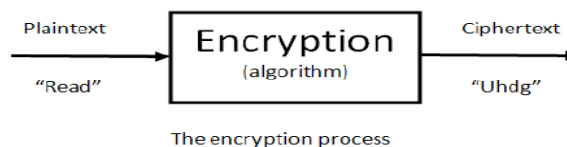
What is cryptography

The term cryptography is derived from Greek, *kryptos* means “hidden” or “secret” and *graphy* means “writing”. So, cryptography is the practice and study of creating a secret information. Cryptography works by Cryptography is a part of mathematics and computer science.

Cryptography is used in applications present in technologically advanced societies; examples include the security of ATM cards, computer passwords, and electronic commerce, which all depend on cryptography. In short we can say that cryptography is needed to secure a secret document. A person who is master in cryptography is called cryptographer.

How cryptography works

For example someone has a secret document to secure. Any document can be secured using cryptography. For example we have to secure the word “Read” using cryptography. The word “Read” in cryptography is called Plain text. Using a set of rule called algorithm, the plain text is changed into cipher text. This process is called encryption. The result of this encryption process is the word “Uhdg”. This is the cipher text.



A set of rule (algorithm) that is used in encryption can be different. There are many algorithm used in encryption. At the above example we use Caesar Cipher algorithm that is used by Julius Caesar to secure his document.

The reverse process of encryption is called decryption. The input is a cipher text. And the result of decryption process is plain text.



Task 2

Show whether the followings statements are true or false (T/F) from Slide 2 - 5.

1. Cryptography is the practice and study of creating a secret information.
2. Not all document can be secured using cryptography.
3. Using a set of rule called algebra, the plain text is changed into cipher text.
4. The word "kryptos" is a Latin origin.
5. The reverse process of encryption is called decryption.

History of cryptography

Cryptography is already used since ancient era. Julius Caesar used cryptography to secure his message from his enemy. He replaced a character with its next three character. For example a character 'A' in alphabet will be replaced by character 'D'. And so on. See the list below of Julius Caesar algorithm.

◇ Plain text : a b c d e f g h I j k l m n o p q r
s t u v w x y z

◇ Cipher Text : d e f g h I j k l m n o p q r s t u
v w x y z a b c

In the era of World War II, German Nazi was also used cryptography to secure its message. Nazi used a machine called Enigma to encrypt and decrypt the messages. In this way Nazi thought its message would be difficult to break by US and its allies. Below is a picture of Enigma used by Nazi.



Unfortunately the algorithm of Enigma can be broken by US army.

In computer technology, cryptography is still used to secure a computer data or document. For example in ATM machine, computer passwords, and also in electronic commerce. Using computer technology someone can use many sophisticated algorithm for example RSA, DES, and PGP.

COMPUTER TERMS

- ◇ Plain text = a text that can be read by anybody. This text is not secured yet.
- ◇ Cipher text = a secret text resulting from encryption process.
- ◇ Algorithm = a set of rule to encrypt a document.
- ◇ Enigma = a machine like typewriter that is used by Nazi during World War II to secure a document before transmitted.
- ◇ Cryptographer = a person who is master in cryptography.

Task 2

Figure out this message.

**“BRX KDYH MXVW GLVFRYHUHD WKHDQFLHQW VHFUHW FRGLQJ
FDOOHG MXOLXV FDHVDU DOJRULWKP”**

What does it say?

FURTHER READINGS

- ✓ <http://en.wikipedia.org/wiki/Cryptography>
- ✓ http://en.wikipedia.org/wiki/Cryptography_Classification
- ✓ http://en.wikipedia.org/wiki/Encyclopedia_of_Cryptography_and_Security
- ✓ http://en.wikipedia.org/wiki/Japanese_cryptology_from_the_1500s_to_Meiji
- ✓ http://en.wikipedia.org/wiki/List_of_important_publications_in_computer_science#Cryptography
- ✓ <http://www.merriam-webster.com/dictionary/cryptology/>
- ✓ <http://www.csrc.nist.gov/publications/fips/fips197/fips-197.pdf>
- ✓ <http://www.cesg.gov.uk/site/publications/media/notense.pdf>
- ✓ <http://citeseer.ist.psu.edu/cache/papers/cs/22094/http:zSzzSzeprint.iacr.orgzSz2001zSz056.pdf/junod01complexity.pdf>
- ✓ <http://www.rsasecurity.com/rsalabs/node.asp?id=2152>
- ✓ <http://www.ieeecurity.org/Cipher/Newsbriefs/1996/960214.zimmerman.html>
- ✓ <http://www.schneier.com/crypto-gram-0006.html#DES>



Internet stands for: **Internet**networked **Networks**

The Internet is a worldwide connection of millions of computers connected to thousands of different networks. These computers "communicate" that is, share, exchange, and transmit data to another computer on the same or another network.

Nobody owns or controls the Internet. It is a global information system similar in some respects to telephone networks that allow anybody to call any other number anytime, anywhere.

a. **Internet Services**

The Internet has several component applications. These include:

1. **Telnet** - terminal emulation - Allows a user on one computer to log onto a remote computer and run software on that remote computer as if it were on the user's local computer
2. **FTP** – File Transfer Protocol - Allows users to upload and download files from other computers
3. **EDI** – Electronic Data Interchange - Allows for electronic transfer of data between companies over the Internet
4. **IRC** – Internet Relay Chat - Allows people connected over the Internet to participate in discussions. It allows people to converse in "real time," people may actually see you type your questions and responses.
5. **Email** – Electronic Mail, allows people to send and receive electronic messages.
6. **Newsgroup** - This is the Internet equivalent of a discussion group or an electronic bulletin board. There are newsgroups for every conceivable topic and more, from educational technology and Brazil culture to stamp collecting and mountaineering. Computer newsgroups start with *comp* as in comp.apps.spreadsheets. while recreational newsgroups start with *rec* as in rec.arts.cinema. The others are *alt* for alternate, *soc* for social, *sci* for science, and *news* for news.
7. **World Wide Web** is a vast, ever-expanding collection of online documents and information formatted in Hypertext Markup Language (HTML) distributed over the Internet. It is a software application that uses the Internet.

1. Internet address domain

Each computer on the Internet is called an Internet host or a host machine. Each host machine has a special Internet protocol address (IP address) that uniquely identifies that computer. IP addresses were never designed to be seen by human eyes. They are an address that is interpreted by a computer. An example of an IP address is:

205.213.164.10

Since numbers are easy for a computer to work with but difficult for humans, most host machines have a **Domain Name Service (DNS)** address. For instance, the domain name service address of the IP address listed above is: **depts.alverno.edu**

The most common Top Level Domains (TLD) are:

TLD Name	Type of Organization
.com	A commercial organization in
.edu	An educational site in the US
.gov	A government agency in the US
.mil	A military site in the US
.net	A network site
.org	A nonprofit organization

Other TLD names identify geographical locations by country – such as:

TLD Name	Location by country
.au	Australia
.ca	Canada
.dk	Denmark
.fr	France
.de	Germany
.uk	Great Britain
.hk	Hong Kong
.hu	Hungary
.ie	Ireland
.id	Indonesia

Newly added Top-Level Domains include :

TLD Name	Type of Organization
.biz	Businesses
.info	For all users

TLD scheduled to be added soon include:

TLD Name	Type of Organization
.aero	For the air-transport industry
.coop	For cooperatives
.museum	For museums
.name	For individuals
.pro	For professionals

Top-Level Domain Names help the user to identify what type of site they are visiting.

2. Netiquette

There are guidelines on how one must behave in cyberspace. In the Internet these responsibilities are defined by what is called Netiquette. There are different versions of Netiquette on the Web, the following is an example of netiquette.

10 Commandments of Computer Use by Computer Ethics Institute in Washington D.C.

1. Thou shalt not use a computer to harm other people
2. Thou shalt not interfere with other people's computer work
3. Thou shalt not snoop around in other people's computer files
4. Thou shalt not use a computer to steal
5. Thou shalt not use a computer to bear false witness
6. Thou shalt not copy or use proprietary software for which you have not paid
7. Thou shalt not use other people's computer resources without authorization or proper compensation
8. Thou shalt not appropriate other people's intellectual output
9. Thou shalt think about consequences of the program you are writing or the system you are designing
10. Thou shalt always use a computer in ways that ensure consideration and respect for your fellow humans.

Task 1

Answer these questions.

1. In a network, computers 'communicate' with each other. What does it mean?
2. If you want to upload and download files from other computers, what component application do you need?
3. What is the guidelines on how someone must behave in cyberspace called?
4. Can we copy paste other people's intellectual output and claim it as our idea?
5. www.spiegel.de/international/business and www.kompas.com In what country is the location of the website?

Challenge!

Match the top level domain with the correct description in 10 seconds!

- ___ 1) **.com** A. US Educational institution
___ 2) **.gov** B. A non-profit or not-for-profit institution
___ 3) **.org** C. US Governmental agency
___ 4) **.mil** D. A company or business
___ 5) **.edu** E. US Military

Task 2

Take home assignment

In a group, translate the 10
Commandments of Computer Use by
Computer Ethics Institute in
Washington D.C.

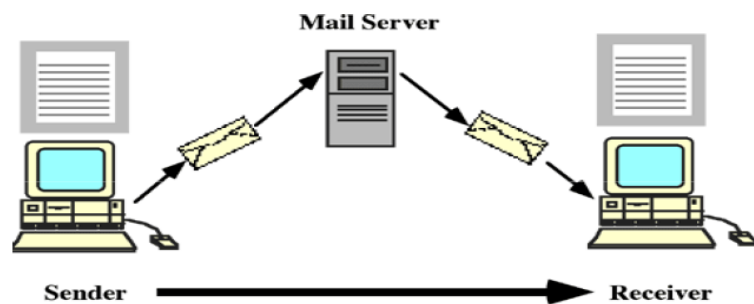
Further readings

- <http://en.wikipedia.org/wiki/Internet>
- <http://www.comptechdoc.org/basic/basicut/>
- <http://dragon.ep.usm.edu/~it365/module/Internet/Internet.htm>
- <http://depts.alverno.edu/cil/mod1/webtutorial/internet.html>



Electronic mail, often abbreviated as email, e-mail, or eMail, is any method of creating, transmitting, or storing primarily text-based human communications with digital communications systems. Unlike conventional mail, email is much faster (conventional mail is sometimes called "*snail mail*" by email users).

Email has both similarities and differences with more conventional postal services. First, messages are posted electronically to individuals at specific addresses much like conventional mail. The address denotes the computer that the individual employs as a mail server. A mail server is like a local post office: it is a computer that sends and receives electronic mail for a specific network.



This is how email works

An email message is made up of several parts. They include:

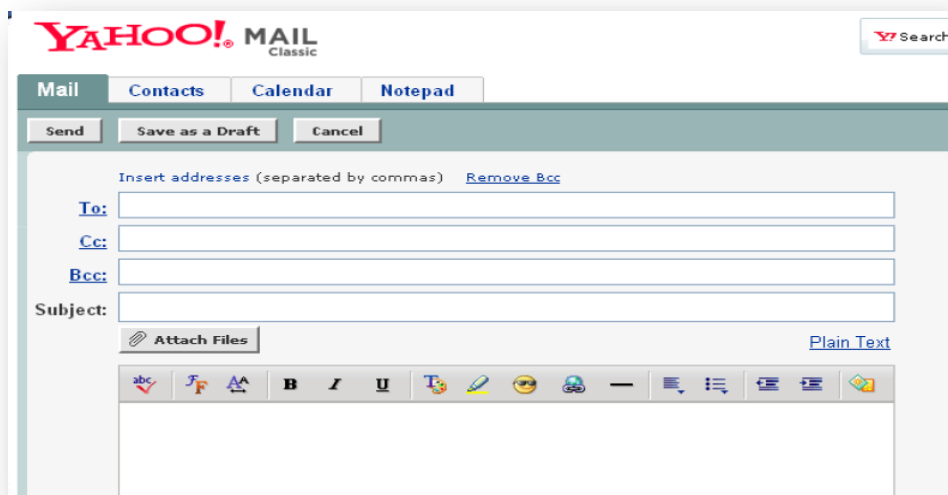
- ✓ **header** - It contains information about the sender, the routing and the time of the message. The header always contains a **subject line**. This is a **very important part** of the message and you should always include a subject line. Some folks sort their messages by subject, so it is rude to not include a subject! The subject line indicates the purpose or content of the message.
- ✓ **message body**, where you write your message
- ✓ **signature**, which identifies the sender. This part is optional and must be set up inside of your email software

Header fields

The message header usually includes at least the following fields:

- ❖ **From:** The e-mail address of the sender
- ❖ **To:** The e-mail address of recipient
- ❖ **Subject:** Topic of message
- ❖ **Date:** The local time and date when the message was written
- ❖ **Cc:** carbon copy, adopted from business communication protocol when typewriters ruled the day
- ❖ **Bcc:** Blind Carbon Copy, when recipient does not need to know who else got a copy of the message. May or may not appear in sender's file copy depending on e-mail software used.

A picture of an email page



The usefulness of e-mail is being threatened by four phenomena:

- a. **E-mail bombardment**, an **e-mail bomb** is a form of net abuse consisting of sending huge volumes of e-mail to an address in an attempt to overflow the mailbox *or* overwhelm the server.
- b. **spamming**, unsolicited commercial (or bulk) email results in information overload for many computer users who receive such email each day
- c. **phishing**, process of attempting to acquire sensitive information such as usernames, passwords and credit card details by masquerading as a trustworthy entity in an electronic communication.
- d. **E-mail worms** use e-mail as a way of replicating themselves into vulnerable computers.

Task 1

Show whether the followings statements are true or false (T/F).

1. Conventional mail is another name for email.
2. Electronic mail is human communication method based on text.
3. The post office is like a mail server to an email.
4. A traditional mail is often called snail mail by computer users.
5. The "Subject" field indicates the recipient of the mail.
6. Email Bomb means sending a very big volume of emails.
7. A subject line identifies the sender.
8. Phishing is a technique used to gain personal information for purposes of identity theft, using fraudulent e-mail messages.

Further readings

- <http://depts.alverno.edu/cil/mod2/whatisemail.html>
 - <http://en.wikipedia.org/wiki/E-mail>
 - <http://dragon.ep.usm.edu/~it365/module/Basics/Basics.htm>
-



Meeting 14

a. Website

A website is a site (location) contains a collection of pages on the World Wide Web. Each Web site contains a home page, which is the first document users see when they enter the site.

Home page, as the name suggests, is the main or opening page of a website. You will notice that several websites use the word "Home" or *an image of a house* to guide surfers back to the main page.

The URL or Uniform Resource Locator is the specific address of a webpage, like <http://geocities.com/toe6000/www1.html> The site might also contain additional documents and files. Each site is owned and managed by an individual, company or organization.

Web page is a document written in Hypertext Mark-up Language (HTML) code that contains text and links to other pages, files, or parts of the document. The earliest Web pages were all-text documents and at present there are still text-based *browsers* like Lynx. Although Tim Berners-Lee also wrote the first multimedia browser in 1990, *graphical user-interface* (GUI), browsers didn't become popular until Mosaic came along in 1993.

Task 1

Is it true or false (T/F)?

1. Each Web site contain a house page.
2. Tim Berners-Lee also wrote the first multimedia browser in 1991.
3. Home page, as the name suggests, is the main or opening page of a website.
4. No one owns and manages each site in the Internet.
5. Mosaic is one of internet browsers.

b. Search engine

Search Engine is a program that searches documents for specified keywords and returns a list of the documents where the keywords were found. Although *search engine* is really a general class of programs, the term is often used to specifically describe systems like Google, Alta Vista and Excite that enable users to search for documents on the World Wide Web and USENET newsgroups.

In a simpler way, a **Web search engine** is a tool designed to search for information on the World Wide Web. Information may consist of web pages, images, information and other types of files. Search engines operate algorithmically or are a mixture of algorithmic and human input.

There are basically three types of search engines: Those that are powered by robots (called crawlers; ants or spiders) and those that are powered by human submissions; and those that are a hybrid of the two.

The following description explains how **Crawler-based search engines** works.

Typically, a search engine works by sending out a *spider* to fetch as many documents as possible. Another program, called an *indexer*, then reads these documents and creates an index based on the words contained in each document. Each search engine uses a proprietary algorithm to create its indices such that, ideally, only meaningful results are returned for each *query*.

Did You Know...

The first tool for searching the Internet, created in 1990, was called "Archie". It downloaded directory listings of all files located on public anonymous FTP servers; creating a searchable database of filenames. A year later "Gopher" was created. It indexed plain text documents. "Veronica" and "Jughead" came along to search Gopher's index systems. The first actual Web search engine was developed by Matthew Gray in 1993 and was called "Wandex".

Examples of three search engines



Task 2

Check your understanding.

1. How many tools to search the Internet ever created from 1990-1993? Name them.
2. How do surfers back to the main page?
3. What is website?
4. What is search engine?
5. Mention types of search engines.

Further readings:

- ✓ <http://dragon.ep.usm.edu/~it365/module/Internet/Internet.htm>
- ✓ <http://www.webopedia.com/DidYouKnow/Internet/2003/HowWebSearchEnginesWork.asp>
- ✓ http://www.webopedia.com/quick_ref/Internet_Search_Engines.asp

Task 3

In groups translate the following!

Google Search Tips:

- a. You can search for a phrase by using quotations ["like this"] or with a minus sign between words [likethis].
- b. You can search by a date range by using two dots between the years [2004..2007].
- c. When searching with a question mark [?] at the end of your phrase, you will see sponsored Google Answer links, as well as definitions if available. In groups translate the following!
- d. Google searches are not case sensitive.
- e. By default Google will return results which include all of your search terms.
- f. Google automatically searches for variations of your term, with variants of the term shown in yellow highlight.
- g. Google lets you enter up to 32 words per search query.