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HARDWARE (ICT) CLASS – 10TH(BOOTING A PC)

LAST CLASS : ASSEMBLE & DISASSEMBLE A PC

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Procuring Parts - First you will need to buy the parts necessary to build the computer. The parts we will use in this project are listed below :

1. **Computer Case**
2. **Processor (CPU)**
3. **Motherboard (SATA Capable))**
4. **Memory (RAM)**
5. **Power Supply**
6. **SATA Cables**
7. **Optical Drive (DVD RW and SATA capable**
8. **Processor Fan**
9. **Case Fan**
10. **Hard Drive (SATA Capable)**
11. **Assortment of case and drive screws**

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BOOTING

STARTUP PROCESS BOOTING

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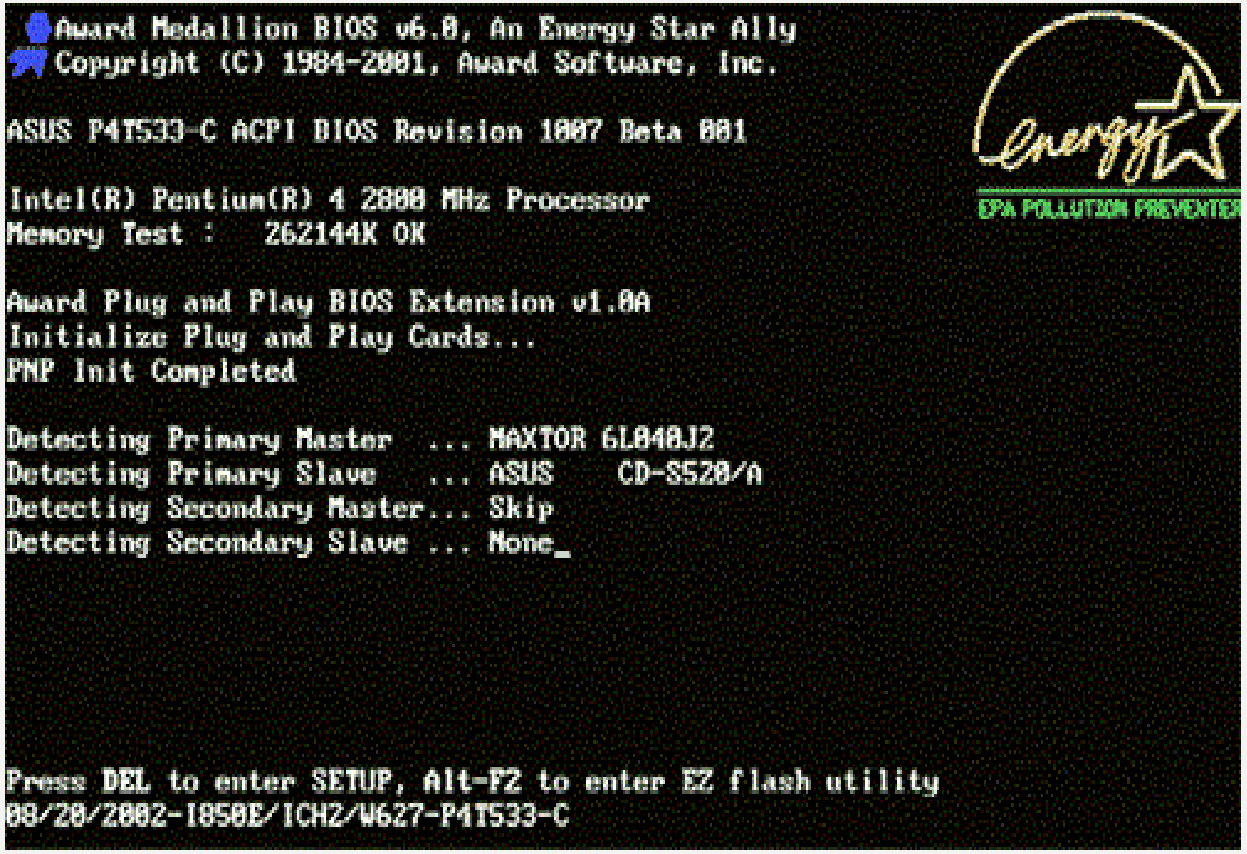
Booting - Booting is the process of powering on a computer and getting into the operating system. During the boot process, the computer will perform a self diagnostic and load necessary drivers and programs that help the computer and devices communicate.

Booting a Computer - Whenever you turn on your computer, the first thing you see is the BIOS software doing its thing. On many machines, the BIOS displays text describing things like the amount of memory installed in your computer, the type of hard disk and so on. It turns out that, during this boot sequence, the BIOS is doing a remarkable amount of work to get your computer ready to run



BOOTING SEQUENCE

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Boot Sequence - Boot sequence is the order in which a computer searches for nonvolatile data storage devices containing program code to load the operating system (OS). Typically, a Macintosh structure uses ROM and Windows uses BIOS to start the boot sequence. Once the instructions are found, the CPU takes control and loads the OS into system memory.

The devices that are usually listed as boot order options in the BIOS settings are hard disks, floppy drives, optical drives, flash drives, etc. The user is able to change the boot sequence via the CMOS setup.

Boot sequence is also called as boot order or BIOS boot order.

- The boot sequence tells the computer what devices it needs to check and load information from before loading into the operating system.
- In the Booting Process all the Files those are Stored into the ROM Chip will also be Loaded for Running the System.
- The boot sequence lists the bootable devices in order of priority.
- The list can be changed by accessing the computer's BIOS.

BOOTING SEQUENCE STEPS

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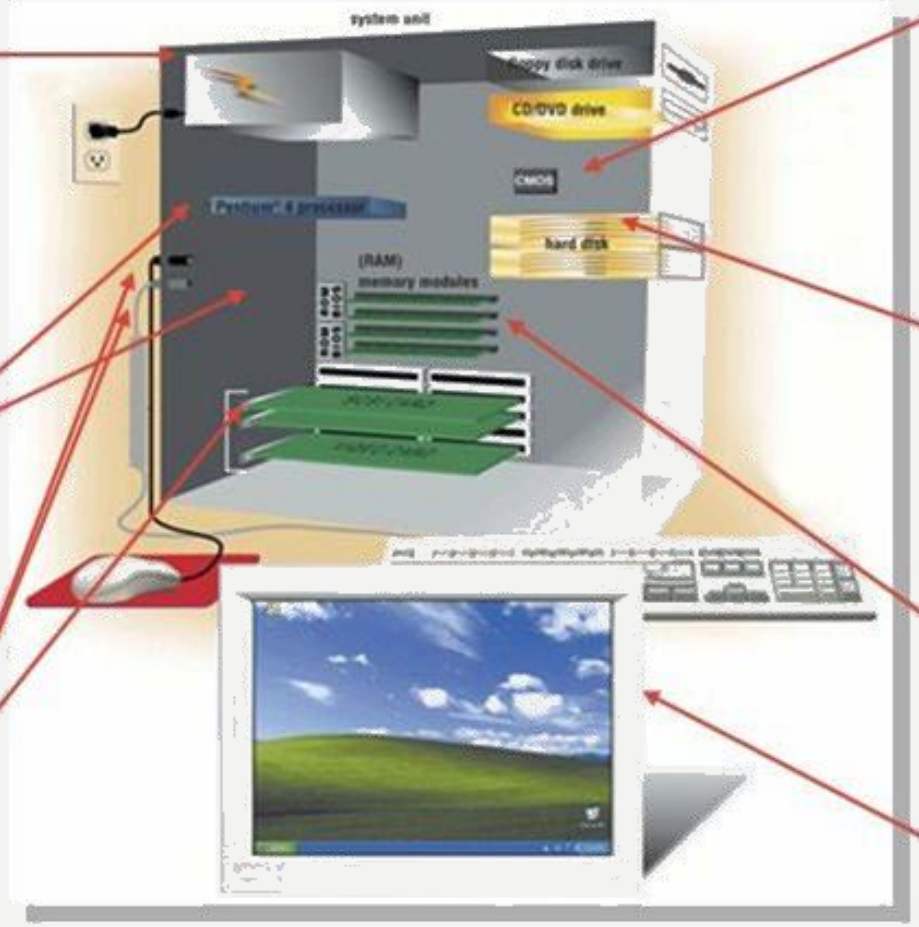
Step 1. Power supply sends signal to components in system unit

Step 2. Processor accesses **BIOS** to start computer

Step 3. **BIOS** runs tests, called the **POST**, to check components such as mouse, keyboard, and adapter cards



Step 4. Results of **POST** are compared with data in **CMOS** chip

Step 5. **BIOS** looks for system files in floppy disk drive or CD/DVD drive, and then hard disk

Step 6. **Kernel** (core) of operating system loads into **RAM**

Step 7. Operating system loads configuration information and displays desktop on screen

BOOTING SEQUENCE STEPS

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The Five Steps of the Boot Sequence - Computers large and small must have some type of start-up process, which is typically called the "boot" process. During this set of steps the computer checks itself to be sure all is well, loads some minimal operational software and loads the operating system. The term "boot" is a shortened version of the word "bootstrap," which was used in the early days of computing to describe the process whereby the computer pulled itself up by its "bootstraps."

1. **Power Up :** The first step of any boot process is applying power to the machine. When the user turns a computer on, a series of events begins that ends when the operating system gets control from the boot process and the user is free to work. When the computer is turned on, the central processor executes some startup code in ROM that is located on the motherboard.
2. **Power-On Self Test :** The next step in the boot process is called the POST, or power on self test. This test checks all connected hardware, including RAM and secondary storage devices to be sure it is all functioning properly. After POST has completed its job, the boot process searches the boot device list for a device with a BIOS on it.
3. **Find a Boot Device :** The I/O system is essential to the operation of the computer because it defines the rules for communications between the CPU and the other devices attached to the computer via the motherboard. The I/O system, sometimes found in the "io.sys" file on the boot device, provides extensions to the BIOS located in ROM on the motherboard.

BOOTING SEQUENCE STEPS

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4. Load the Operating System : Once the hardware functionality is confirmed and the input/output system is loaded, the boot process begins loading the operating system from the boot device. The OS is loaded into RAM, and any instructions specific to the particular operating system are executed. The actual operating system is somewhat irrelevant, as the computer will follow the same boot pattern in any case.

5. Transfer Control : Once the previous steps are complete and the operating system is safely loaded into RAM, the boot process relinquishes control to the OS. The OS then proceeds to execute any pre-configured startup routines to define user configuration or application execution. At the end of the handoff, the computer is ready for use.

Tasks of Booting process

- The first part of the boot process is controlled by BIOS and begins after the POST.
- If POST has determined that all components are functioning properly, the BIOS looks for an OS to load.
- Once the OS initializes, the BIOS copies its files into memory
- The OS loads the device drivers that it needs to control the peripheral devices.
- Then the user can access the system's applications.

ADVANCED BOOT OPTIONS MENU

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- The Advanced Boot Options menu is a selectable list of Windows startup modes and troubleshooting tools.
- The Advanced Boot Options menu is accessed by pressing F8 as the Windows splash screen begins to load.
- In older versions of Windows, the equivalent menu is accessed by holding down the Ctrl key while Windows is starting.
- By Selecting one of the options and pressing Enter will start that mode of Windows, or that diagnostic tool, etc.

ADVANCED BOOT OPTIONS

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Repair Your Computer:

- The Repair Your Computer option starts System Recovery Options, a set of diagnostic and repair tools including Startup Repair, System Restore, Command Prompt, and more.
- This option is available in Windows 7 by default.
- In Windows Vista, the option is only available if System Recovery Options has been installed on the hard drive.
- System Recovery Options isn't available in Windows XP.

Safe Mode:

- Starts Windows with the minimum of drivers and services possible.

Safe Mode with Networking:

- Same as Safe Mode, but also includes drivers and services needed to enable the network.

Safe Mode with Command Prompt:

- Same as Safe Mode, but loads the Command Prompt as the user interface.
- In general, try Safe Mode first.
- If that doesn't work, try Safe Mode with Command Prompt, assuming you have command line troubleshooting plans.
- Try Safe Mode with Networking if you'll need network or Internet access while in Safe Mode.

ADVANCED BOOT OPTIONS MENU AVAILABILITY

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Enable Boot Logging:

- The Enable Boot Logging option will keep a log of the drivers being loaded during the Windows boot process.
- If Windows fails to start, you can reference this log and determine which driver was last successfully loaded, or first unsuccessfully loaded, giving you a starting point for your troubleshooting.

Last Known Good Configuration (advanced):

- The Last Known Good Configuration (advanced) option starts Windows with the drivers and registry data that were recorded the last time Windows was successfully started and then shut down.
- This option is a great thing to try first, before any other troubleshooting, because it returns a lot of really important configuration information back to a time when Windows worked.

Advanced Boot Options Menu availability :

- The Advanced Boot Options menu is available in Windows 7, Windows Vista, Windows XP, and the Windows server operating systems released alongside those versions of Windows.
- In earlier versions of Windows like Windows 98 and Windows 95, the Advanced Boot Options menu was called the Microsoft Windows Startup Menu and functioned similarly.

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THANK'S

NEXT CLASS (CMOS & BIOS SETTING)