

OSOU COURSE MATERIAL

ON

COMPUTER FUNDAMENTALS

COMPUTER FUNDAMENTALS

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WHAT IS A COMPUTER

A **computer** is a device that accepts information (in the form of digitalized data) and manipulates it for some result based on a program or sequence of instructions on how the data is to be processed.

FUNCTIONS OF A COMPUTER

The functions of the computer are

1. Input :-Receiving of accepting information from outside sources.
2. Storage:- Store data received in Random Access Memory / Hard Disk
3. Processing :- Process data in the Random Access Memory/Hard Disk
4. Output :- Deliver the processed data on the Monitor/ stored file on the hard disk / Print out.

WHERE COMPUTERS ARE USED AND WHY

Computers are used in areas which require huge amount of data to be processed at a short period of time to give desired required output.

Where Computer is used

Computer are used in many fields and they are

1. Scientific Calculations where a human error is prone
2. Large scale Data processing which human being cannot do
3. Getting data from dangerous locations where a human being cannot reach or may loose life.
4. Telecommunication
5. Film production

Why use a computer:-

1. Very fast accurate output within a short period which a human being cannot.
2. Do laborious jobs which a human being cannot.
3. Do impossible jobs such a computerized diagnosis of the human body in the field of Radiology, Pathology and other fields of medical science.

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Computer is composed of 2 parts

1. **Hardware:-** Computer **hardware** is the collection of physical parts of a computer system. This includes the computer case, monitor, keyboard, and mouse. It also includes all the parts inside the computer case, such as the hard disk drive, motherboard, video card, and many others.
2. **Software:-** **Software** is a general term for the various kinds of **programs** used to operate computers and related devices.

GENERATIONS OF COMPUTERS

1st Generation:- PERIOD :-(1946-1959).

1. Used Vacuum tubes which radiated a lot of heat.
2. Worked on batch processing operating systems
3. Input devices used :- Punched Cards, paper tape, magnetic tape.
4. Output devices used :- Punched cards, paper tape, magnetic tape.
5. Used machine code as programming language.
6. Consumed a lot of electricity
7. Slow input and slow output
8. Very huge in size and not portable.

Some of the examples of 1ST Generation computers are

- ENIAC
- EDVAC
- UNIVAC
- IBM-701
- IBM-650

2nd Generation:- (1959-1965)

1. Used transistors which consumed less power.
2. More compact in size
3. More reliable and faster than the first generation computers
4. Used magnetic core as the primary memory and magnetic tape and magnetic disk as secondary memory.
5. Used machine, assembly language and high level programming languages such as Fortran, COBOL.
6. Used batch processing and multiprogramming operating systems.
7. Needed A/C

Some of the examples of 2nd Generation computers are

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- IBM 1620
- IBM 7094
- CDC 1604
- CDC 3600
- UNIVAC 1108

3rd Generation(1965-1971)

1. Used Integrated Circuits.
2. More reliable and faster in comparison to the previous 2 generation computers.
3. Less heat and less maintenance.
4. Consumed less electricity
5. Costly
6. Supported high level languages

Some of the examples of 3rd Generation computers are

- IBM-360 series
- PDP(Personal Data Processor)
- IBM-370/168
- TDC-316
- Honeywell-6000 series

4th Generation((1971-1980)

1. Microprocessor Based
2. Uses VLSI(Very large scale Integration Circuit) Technology
3. Very cheap
4. Portable And Reliable
5. Use the concept of pipeline processing
6. No A/C required
7. Internet was introduced in these systems

Some computers of this generation were:

- PDP 11
- DEC 10
- STAR 1000
- CRAY-X-MP(Super Computer)
- CRAY-1(Super Computer)

5th Generation(1980-)

1. Used Ultra Large Scale Integration circuits
2. Use of high level languages such as C,C++,Java, vb.net.c#.net
3. Use of web Development and web technologies
4. High speed portable and reliable
5. Used Natural language processing
6. Used parallel processing
7. More friendly user interfaces with Multimedia features
8. Use of web technologies such as php,JSP,J2EE,SAP
9. Used super conductor technology
10. Very powerful compact computers at cheaper rates

Some of the computers of this generation are

- Desktop
- Laptop
- Notebook

TYPES OF COMPUTER

At present computers are classified into 4 types according to use. They are

1. Personal
2. Workstation
3. Mainframe
4. Super

Personal Computers :- Personal computers are the computers which are used by person for his/her regular computer activities. These activities include software development as a freelancer, Business analyst who can work at a remote location, businessman to store regular accounts, Civil engineer who works on CAD/CAM. Based on the requirement personal computer vary in cost.

Operating systems support :-

- MAC

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- Windows 7/8/10
- Linux

Some of the advantages of the personal computer include

1. Workplace independence
2. Fast processing to give desired output.
3. Internet
4. Bluetooth
5. CD/DVD writers
6. Relatively high memory (4GB-16 GB) to design and develop stand alone, client server, web based applications
7. Relatively high secondary memory (500 GB-1TB) for secondary storage purpose.
8. Supports external hard drives and pen drives, cards to retrieve and store data.

Workstation :- This computer is used when the number of users are in hundreds and all these users requests come at one time or may be in batches. The workstation computer processes data given by users at a very high speed and gives output to all users. Examples of workstations include Servers in hospitals, hotels, schools, colleges, universities where different kinds of data that is input and different kinds of reports are generated.

Operating Systems that support the work station are some as defined below

1. Windows NT
2. Windows 2000
3. Windows 2008
4. Unix
5. Linux.

Advantages of Workstation include

1. Multi user and multitasking
2. High Speed processing
3. Parallel processing(multiple jobs at one time).
4. High performance and reliable for 24X7 works.
5. Can handle very high input from various sources, process and store.
6. Can cater different forms of output (word files, xls files, reports).

Main frames :- Main frames are used when the number of users are in thousands. It is used where data is voluminous such as census data which needs to be process. Large batch processing jobs

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1. Multi user and multitasking
2. High Speed processing
3. Parallel processing(multiple jobs at one time).
4. High performance and reliable for 24X7 works.
5. Can handle very high input from various sources ,process and store.
6. Supports large batch processing jobs.
7. Supports voluminous input data from tape drives

Super Computers :- Super computers are used where

Lots of data need to be processed and output needs to be generated within no time.

Use [grid computing](#) approach/ centralized [massively parallel](#) system

use over 100,000 processors (some being [graphic units](#)) connected by fast connections

used in the following

- electronic design
- weather forecasting
- scientific simulations
- (animated) graphics
- fluid dynamic calculations
- nuclear research
- analysis of geological data

Some of the problems of Super Computer are it generates a lot of heat and need to super cooled.

Speed of the Super Computer

In general, the speed of supercomputers is measured and [benchmarked](#) in "FLOPS" (*FLoating point Operations Per Second*), and not in terms of "MIPS" (Million Instructions Per Second), as is the case with general-purpose computers.^[81] These measurements are commonly used with an [SI prefix](#) such as [tera-](#), combined into the shorthand "TFLOPS" (10^{12} FLOPS, pronounced *teraflops*), or [peta-](#), combined into the shorthand "PFLOPS" (10^{15} FLOPS, pronounced *petaflops*.)

"[Petascale](#)" supercomputers can process one quadrillion (10^{15}) (1000 trillion) FLOPS. [Exascale](#) is computing performance in the exaFLOPS (EFLOPS) range. An EFLOPS is one quintillion (10^{18}) FLOPS (one million TFLOPS).

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Some Of The Fastest Super Computers In The World

Year	Supercomputer	<u>Peak speed (Rmax)</u>	Location
2013	NUDT Tianhe-2	33.86 PFLOPS	Guangzhou, China
2012	Cray Titan	17.59 PFLOPS	Oak Ridge, U.S.
2012	IBM Sequoia	17.17 PFLOPS	Livermore, U.S.
2011	Fujitsu K computer	10.51 PFLOPS	Kobe, Japan
2010	Tianhe-1A	2.566 PFLOPS	Tianjin, China
2009	Cray Jaguar	1.759 PFLOPS	Oak Ridge, U.S.
2008	IBM Roadrunner	1.026 PFLOPS	Los Alamos, U.S.
		1.105 PFLOPS	

COMPUTER MEMORY UNITS

Computer - Memory Units. Memory unit is: the amount of data that can be stored in the storage unit. that in which storage capacity is expressed in terms of Bytes.

Sr.No.	Unit	Description
1	Bit (Binary Digit)	A binary digit is logical 0 and 1 representing a passive or an active state of a component in an electric circuit.
2	Nibble	A group of 4 bits is called nibble.
3	Byte	A group of 8 bits is called byte. A byte is the smallest unit which can represent a data item or a character.
4	Word	<p>A computer word, like a byte, is a group of fixed number of bits processed as a unit which varies from computer to computer but is fixed for each computer.</p> <p>The length of a computer word is called word-size or word length and it may be as small as 8 bits or may be as long as 96 bits. A computer stores the information in the form of computer words</p>

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5	Kilobyte (KB)	1 KB = 1024 Bytes
6	Megabyte (MB)	1 MB = 1024 KB
7	Giga Byte (GB)	1 GB = 1024 MB
8	Tera Byte (TB)	1 TB = 1024 GB
9	Peta Byte (PB)	1 PB = 1024 TB

NUMBER SYSTEM

*A set of values used to represent different quantities is known as **Number System**".* For example, a number system can be used to represent the number of students in a class or number of viewers watching a certain TV program etc. The digital computer represents all kinds of data and information in binary numbers. It includes audio, graphics, video, text and numbers. The total number of digits used in a number system is called its base or radix. The base is written after the number as subscript such as 51210_2 .

Some important number systems are as follows.

- Decimal number system
- Binary number system
- Octal number system
- Hexadecimal number system

When we type some letters or words, the computer translates them in numbers as computers can understand only numbers. A computer can understand positional number system where there are only a few symbols called digits and these symbols represent different values depending on the position they occupy in the number.

A value of each digit in a number can be determined using

- The digit
- The position of the digit in the number
- The base of the number system (where base is defined as the total number of digits available in the number system).

Decimal Number System

The number system that we use in our day-to-day life is the decimal number system. Decimal number system has base 10 as it uses 10 digits from 0 to 9. In decimal number system, the successive positions to the left of the decimal point represent units, tens, hundreds, thousands and so on.

Each position represents a specific power of the base (10). For example, the decimal number 3542 consists of the digit

2 in the units position,

4 in the tens position,

5 in the hundreds position, and

3 in the thousands position, and its value can be written as

$$3 \times 10^3 + 5 \times 10^2 + 4 \times 10^1 + 2 \times 10^0$$

$$= 3 \times 1000 + 5 \times 100 + 4 \times 10 + 2 \times 1$$

$$= 3542$$

These number systems are frequently used in computers.

S.N.	Number System and Description
1	Binary Number System Base 2. Digits used : 0, 1
2	Octal Number System Base 8. Digits used : 0 to 7
3	Hexa Decimal Number System Base 16. Digits used : 0 to 9, Letters used : A- F

Binary Number System

Characteristics of binary number system are as follows:

- Uses two digits such as 0 and 1.
- Binary called base 2 number system
- Each position in a binary number represents a 0 power of the base (2).
Example 2^0
- Last position in a binary number represents a power of the base (2).
Example 2^m where m represents the last position - 1.

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Example

Binary Number : 10111_2

Calculating Decimal Equivalent:

Step	Binary Number	Decimal Number
Step 1	10111_2	$((1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0))_{10}$
Step 2	10111_2	$(16 + 0 + 4 + 2 + 1)_{10}$
Step 3	10111_2	22_{10}

Octal Number System

Characteristics of octal number system are as follows:

- Uses eight digits, 0,1,2,3,4,5,6,7.
- Octal number system is also known as base 8 number system
- Each position in an octal number represents a power t of the base (8).
Example 8^t
- Last position in a binary number represents a power of the base (2).
Example 2^m where m represents the last position - 1.

Example

Octal Number : 13472_8

Calculating Decimal Equivalent:

Step	Octal Number	Decimal Number
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Step 1	13472_8	$((1 \times 8^4) + (3 \times 8^3) + (4 \times 8^2) + (7 \times 8^1) + (2 \times 8^0))_{10}$
Step 2	13472_8	$(4096 + 1536 + 256 + 56 + 2)_{10}$
Step 3	13472_8	5496_{10}

Hexadecimal Number System

Characteristics of hexadecimal number system are as follows:

- Uses 10 digits and 6 letters, 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F.
- Letters represents numbers
 - A = 10.
 - B = 11,
 - C = 12,
 - D = 13
 - E = 14
 - F = 15.
- Hexadecimal system is also known as base 16 number system
- Each position in a hexadecimal number represents a t power of the base (16). Example 16^t
- Last position in a hexadecimal number represents a x power of the base (16). Example 16^x where x represents the last position - 1.

Example

Hexadecimal Number : $25ADE_{16}$

Calculating Decimal Equivalent:

Step	Binary Number	Decimal Number
Step 1	$25ADE_{16}$	$((2 \times 16^4) + (5 \times 16^3) + (A \times 16^2) + (D \times 16^1) + (E \times 16^0))_{10}$
Step 2	$25ADE_{16}$	$((2 \times 16^4) + (5 \times 16^3) + (10 \times 16^2) + (13 \times 16^1) + (14 \times 16^0))_{10}$
Step 3	$19FDE_{16}$	$(131072 + 20480 + 2560 + 208 + 224)_{10}$
Step 4	$19FDE_{16}$	154544_{10}

NUMBER CONVERSION

Decimal to Binary Conversion

Let us consider an example decimal to binary

$(14.25)_{10}$ is a decimal number

Break the decimal number into 2 parts namely 14 and .25

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We have to first find the binary of $(14)_{10}$

$$14/2=7 \quad \text{remainder} = 0$$

$$7/2 = 3 \quad \text{remainder} = 1$$

$$3/2 = 1 \quad \text{remainder} = 1$$

$$1/2 = 0 \quad \text{remainder} = 1$$

Going from bottom to top looking at the remainder we get $(1110)_2$

Now considering 0.25 the binary is

$$0.25 \times 2 = 0.50 \quad \text{take the 0 on the left side of 0.50}$$

$$0.50 \times 2 = 1.00 \quad \text{take the 1 on the left side of 1.00}$$

Now 0.00 has 0 on the left side

0.00 has .00 on the right side and 0 on the left and so no more calculation

Going from top to bottom we get $(.010)_2$

Now let us club both these two they are $(1110)_2$ and $(.010)_2$

We get $(1110.01)_2$ which is $(14.25)_{10}$

Now let us check $(1110.01)_2 = (14.25)_{10}$

$$(1110.01)_2 = 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 + 0 \times 2^{-1} + 1 \times 2^{-2} + 0 \times 2^{-3}$$

$$= 8 + 4 + 2 + 0 + 0/2 + 1/4 + 0/8$$

$$= 14 + 0.25 = (14.25)_{10}$$

Negative decimal numbers in binary.

00001010 = decimal 10

10001010 = decimal -10

DECIMAL TO OCTAL CONVERSION

$$(7652.45)_{10} = (?)_8$$

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operation	quotient	remainder
7652/8	956	4
956/8	119	4
119/8	14	7
14/8	1	6
1/8	0	1

$(7652)_{10} = (16744)_8$

=====

Now for the Decimal Places

=====

$0.45 \times 8 = 3 + 0.6$:::: so the first yield is a 3

We take the remaining decimal now,

$0.6 \times 8 = 4 + 0.8$:::: so the next yeild is a 4

We take the remaining decimal now,

$0.8 \times 8 = 6 + 0.4$:::: so the next yield is a 6

We take the remaining decimal now,

$0.4 \times 8 = 3 + 0.2$:::: so next yield is a 3

OK at this point if you continue you will notice a recurring theme. If we multiple 0.2×8 that will leave a decimal remainder 0.6, which multiplied by 8 will leave a decimal remainder of 0.8 etcetera.

There is no point continuing so the octal of $0.45 = 0.3463$

Thus the octal of $7562.45 = 16612.3463$

DECIMAL TO HEXADECIMAL

Steps:

1. Divide the decimal number by 16. Treat the division as an integer division.
2. Write down the remainder (in hexadecimal).
3. Divide the result again by 16. Treat the division as an integer division.
4. Repeat step 2 and 3 until result is 0.
5. The hex value is the digit sequence of the remainders from the last to first.

Note: a *remainder* in this topic refers to the left over value after performing an integer division.

HEXADECIMAL	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
DECIMAL	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Example 1

Convert the number **1128** DECIMAL to HEXADECIMAL

NOTES	DIVISION	RESULT	REMAINDER (in HEXADECIMAL)
Start by dividing the number by 16, that is (1128/16). 1128 divided by 16 is 70.5. So the integer division result is 70 (throw	1128 / 16	70	8

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<p>out anything after the decimal point). Record it on the RESULT column.</p> <p>The remainder is (70.5 - 70) multiplied with 16; or (0.5 times 16), which is 8. Record it on the REMAINDER column.</p>			
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<p>Then, divide the result again by 16, that is (70/16). (the number 70 on the DIVISION column comes from the previous RESULT).</p> <p>In this case, $70/16=4.375$. So the integer division result is 4 (throw out anything after the decimal point)</p> <p>The remainder is (0.375 multiplied with 16, which is 6.</p>	70 / 16	4	6
<p>Repeat. Note here that $4/16=0.25$. So the integer division result is 0.</p> <p>The remainder is (0.25-0) multiplied with 16, which is 4.</p>	4 / 16	0	4
<p>Stop because the result is already 0 (0 divided by 16 will always be 0)</p>			
<p>Well, here is the answer. These numbers come from the REMAINDER column values (read from</p>			468

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bottom to top)			
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Side note: You can get the remainder of a division using the **Modulus** (or % operator in programming code). Ie: $1128\%16=8$.

Conversion of Fractional Decimal Number into Hexadecimal

Procedure

The steps for the conversion are given below:

Successive multiplication is used to convert a given fractional decimal number to its equivalent hexadecimal fraction.

1. Here the given decimal fraction is successively multiplied by the base of the target number system (16, here it is hexadecimal system).
2. During each multiplication iteration, the product generated will have a carry (integer part of the product) and a fractional part.
3. The carry obtained at each multiplication step becomes a numeral in the hexadecimal fraction.
4. The fractional part of the product is again multiplied by base 16 in the next step and the process is repeated until the **fractional part becomes zero** or the **number of multiplication iteration equals the number of digits after the decimal point in the given decimal fraction**.
5. Weights are assigned for the carry obtained at each multiplication step in the increasing order starting from the first multiplication step to the last step, such that the carry obtained in the first multiplication iteration is the **most significant bit (MSD)** after the decimal point and the carry obtained in the last multiplication iteration is the **least significant bit (LSD)**.
6. This procedure is illustrated in the following example.

Ex1: Convert $(0.0628)_{10}$ decimal fraction to hexadecimal fraction $(?)_{16}$ using successive multiplication method

1st Multiplication Iteration

Multiply 0.0628 by 16

$0.0628 \times 16 = 1.0048$ (Product) Fractional part=0.0048 Carry=1 (**MSD**)

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2nd Multiplication Iteration

Multiply 0.0048 by 16

$$0.0048 \times 16 = 0.0768(\text{Product}) \quad \text{Fractional part} = 0.0768 \quad \text{Carry} = 0$$

3rd Multiplication Iteration

Multiply 0.0768 by 16

$$0.0768 \times 16 = 1.2288(\text{Product}) \quad \text{Fractional part} = 0.2288 \quad \text{Carry} = 1$$

4th Multiplication Iteration

Multiply 0.2288 by 16

$$0.2288 \times 16 = 3.6608(\text{Product}) \quad \text{Fractional part} = 0.6608 \quad \text{Carry} = 3 \text{ (LSD)}$$

Here the fractional part doesn't become zero but we obtain required number of significant digits after the decimal point. Thus we stop the multiplication iteration and assign the weights to the digits obtained in each multiplication step in the increasing order starting from the 1st multiplication step to last multiplication step.

Carry from the 1st multiplication iteration becomes **MSB** and carry from 4th iteration becomes **LSB** after the decimal point.

Hence, the fractional hexadecimal number of the given decimal fraction

(0.0628)₁₀ is (0.1013)₁₆.

So a number **(1128.0628)₁₀ = (468.1013)₁₆**

BINARY TO OCTAL

Let us take the number **(101011.101)₂**

Break It into 2 chunks at the decimal point.

y

You come across 2 binaries **(101011)₂** and **(101)₂**

(101011)₂ = (101 011)₂ broken from left as chunk of 3 numbers from right to left = **(101)₂ = 1 X 2² + 0 X 2¹ + 1X2⁰ = 4+0+1=5**

$$(011)_2 = 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 = 3$$

$$(101)_2 = 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 4 + 0 + 1 = (5)_8$$

Now Combining **(101011.101) = (53.5)₈**

BINARY TO HEXADECIMAL

(10101010.1010)₂ = (?)₁₆

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First break 10101010.1010 into 2 parts

Integer part = 10101010

Fractional part = .1010

Now take the integer part = 10101010

Now from the right to the left count 4 bits (0/1)

You get 1010 (from left to right) = $1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 = 8 + 0 + 2 + 0 = 10$
=A IN HEX

Now start checking the other bits in 4 from right to left from where you left

You get 1010 (from left to right) = $1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 = 8 + 0 + 2 + 0 = 10$
=A IN HEX

Now get the fraction .1010 =.A

=(AA.A)₁₆

HEXADECIMAL TO BINARY

To convert hexadecimal to binary we use the following principle

Let us consider a hexadecimal number (4E)₁₆

First we break the hexadecimal number we get 2 numbers 4 and E

Now we find the binary of 4 =0100

Now we find the binary of E=14 according the hexadecimal chart as below

The Binary of 14 is 1110

Club these two you get (0100 1110)₂

HEXADECIMAL TO OCTAL

Convert Hexadecimal to Binary

Now group the binary numbers as 3 bits = 1 set

Say (101)₂ = (5)₈

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And Club

Let us take the example $(AA.A)_{16} = (10101010.1010)_2$

Break the binary number into 2 parts

Decimal = $(10101010)_2$

Fraction = $(.1010)_2$

Decimal = $(10101010)_2$

Going from right to left break in this fashion = $(010)_2$ $(101)_2$ $(010)_2 = (252)_8$

Fraction = $(.1010)_2$

Remove the decimal point

$(1010)_2 = (101)_2$ The right most 0 is ignored = $(5)_8$

Now clubbing = $(252.5)_8$

OCTAL TO BINARY

$(252.5)_8$

Break 252.5 into

Numeric 252

Fraction 0.5

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Numeric 252 into (2 5 2)

2= 010

5=101

2=010

Combining (010101010)₂

0.5 ignoring the decimal point 5 =(101)₂

(010101010)₂ and (101)₂

(010101010. 101)₂

OCTAL TO HEXADECIMAL

(252.5)₈

Break 252.5 into

Numeric 252

Fraction 0.5

Numeric 252 into (2 5 2)

2= 010

5=101

2=010

Combining (010101010)₂

0.5 ignoring the decimal point 5 =(101)₂

(010101010)₂ and (101)₂

(010101010. 101)₂

Convert Binary To Hexadecimal

COMPUTER FUNDAMENTALS

$(010101010.101)_2$

Break it into 4 starting from left and right

$= (\underline{0000} \ \underline{1010} \ \underline{1010} \ \underline{1010})_2$

$= (0 \ A \ A \ A)_{16}$

$= (AA.A)_{16}$

CONVERSION OF NEGATIVE NUMBERS TO BINARY, HEXADECIMAL AND OCTAL

Find the binary ,octal, hexadecimal of -20

Step -1 find the binary of $(20)_{10} = (00000000 \ 00010100)_2$ IN 16 BIT FORM

Step-2 Find the 2nd compliment of $(00000000 \ 00010100)_2$

$= (11111111 \ 11101011) + 1$

$= (\underline{1111} \ \underline{1111} \ \underline{1110} \ \underline{1100})_2$

$= (F \ F \ E \ C)_{16}$

$= (\underline{001} \ \underline{111} \ \underline{111} \ \underline{111} \ \underline{101} \ \underline{100})_2$

$= (1 \ 7 \ 7 \ 7 \ 5 \ 4)_8$

Find the binary ,octal, hexadecimal of -20.5

STEP-1 Find the binary of $(20.5)_{10}$

$(00000000 \ 00010100.1)_2$ IN 16 BIT FORM

Find the 2nd compliment of the above number

$= 11111111 \ 11101011.0$

$+1$

$(11111111 \ 11101011.1)_2 = -20.5$

BREAKING IT INTO 4 NUMBERS FROM LEFT OF DECIMAL AND RIGHT OF DECIMAL

$(\underline{1111} \ \underline{1111} \ \underline{1110} \ \underline{1011.1000})_2$

$= (F \ F \ E \ B.1)_{16}$

$(001\ 111\ 111\ 111\ 101\ 011.100)_2$

$= (1\ 7\ 7\ 7\ 5\ 3.1)_8$

Binary Arithmetic

- [Addition](#)
- [Subtraction](#)
- [Multiplication](#)
- [Division](#)
- [Notes](#)

BINARY ADDITION

Rules of Binary Addition

- $0 + 0 = 0$
- $0 + 1 = 1$
- $1 + 0 = 1$
- $1 + 1 = 0$, and carry 1 to the next more significant bit

For example,

$(1010.1)_2 = (10.5)_{10}$

$+ (1010.1)_2 = (10.5)_{10}$

$1\ 0\ 1\ 0\ 1.0 = (21)_{10}$

BINARY SUBTRACTION

Rules of Binary Subtraction

- $0 - 0 = 0$
- $0 - 1 = 1$, and borrow 1 from the next more significant bit
- $1 - 0 = 1$
- $1 - 1 = 0$

For example,

$$(1010.1)_2 = (10.5)_{10}$$

$$- (0010.1)_2 = (2.5)_{10}$$

$$(10000)_2 = (8)_{10}$$

Binary multiplication

Rules of Binary Multiplication

- $0 \times 0 = 0$
- $0 \times 1 = 0$
- $1 \times 0 = 0$
- $1 \times 1 = 1$, and no carry or borrow bits

For example,

$$(10)_2 = 2$$

$$\text{X } (11)_2 = 3$$

$$10$$

$$10$$

$$(110)_2 = (6)_{10}$$

Binary Division

Binary division is the repeated process of subtraction, just as in decimal division.

For example,

$$(110)_2 = (6)_{10} / (10)_2 = 2 = (11)_2 = 3$$

$$10 \overline{)110.1} \overline{)11.01}$$

10

10

10

010

010

0

COMPUTER FUNDAMENTALS

1^S COMPLIMENT

The steps to be followed in subtraction by 1's complement are:

- i) To write down 1's complement of the subtrahend.
- ii) To add this with the minuend.
- iii) If the result of addition has a carry over then it is dropped and an 1 is added in the last bit.
- iv) If there is no carry over, then 1's complement of the result of addition is obtained to get the final result and it is negative.

Evaluate:

(i) 110101 – 100101

Solution:

1's complement of 10011 is 011010. Hence

$$\begin{array}{r} \text{Minued -} \quad \quad \quad 1 \ 1 \ 0 \ 1 \ 0 \ 1 \\ \text{1's complement of subtrahend -} \quad \quad \underline{0 \ 1 \ 1 \ 0 \ 1 \ 0} \\ \text{Carry over -} \quad 1 \quad \quad 0 \ 0 \ 1 \ 1 \ 1 \ 1 \\ \quad \quad \quad \quad \quad \underline{\quad \quad \quad 1} \\ \quad \quad \quad \quad \quad 0 \ 1 \ 0 \ 0 \ 0 \ 0 \end{array}$$

The required difference is 10000

(ii) 101011 – 111001

Solution:

1's complement of 111001 is 000110. Hence

$$\begin{array}{r} \text{Minued -} \quad \quad \quad 1 \ 0 \ 1 \ 0 \ 1 \ 1 \\ \text{1's complement -} \quad \quad \underline{0 \ 0 \ 0 \ 1 \ 1 \ 0} \\ \quad \quad \quad \quad \quad 1 \ 1 \ 0 \ 0 \ 0 \ 1 \end{array}$$

Hence the difference is – 1 1 1 0

COMPUTER FUNDAMENTALS

(iii) 1011.001 – 110.10

Solution:

1's complement of 0110.100 is 1001.011 Hence

$$\begin{array}{r} \text{Minued -} \quad \quad \quad 1\ 0\ 1\ 1\ .\ 0\ 0\ 1 \\ \text{1's complement of subtrahend -} \quad \quad \underline{1\ 0\ 0\ 1\ .\ 0\ 1\ 1} \\ \text{Carry over -} \quad 1 \quad 0\ 1\ 0\ 0\ .\ 1\ 0\ 0 \\ \quad \quad \quad \quad \quad \underline{\quad \quad \quad 1} \\ \quad \quad \quad \quad \quad 0\ 1\ 0\ 0\ .\ 1\ 0\ 1 \end{array}$$

Hence the required difference is 100.101

(iv) 10110.01 – 11010.10

Solution:

1's complement of 11010.10 is 00101.01

$$\begin{array}{r} 1\ 0\ 1\ 1\ 0\ .\ 0\ 1 \\ \underline{0\ 0\ 1\ 0\ 1\ .\ 0\ 1} \\ 1\ 1\ 0\ 1\ 1\ .\ 1\ 0 \end{array}$$

Hence the required difference is – 00100.01 i.e. – 100.01

2^s COMPLIMENT

The operation is carried out by means of the following steps:

- (i) At first, 2's complement of the subtrahend is found.
- (ii) Then it is added to the minuend.
- (iii) If the final carry over of the sum is 1, it is dropped and the result is positive.
- (iv) If there is no carry over, the two's complement of the sum will be the result and it is negative.

The following examples on subtraction by 2's complement will make the procedure clear:

Evaluate:

(i) 110110 - 10110

Solution:

The numbers of bits in the subtrahend is 5 while that of minuend is 6. We make the number of bits in the subtrahend equal to that of minuend by taking a '0' in the sixth place of the subtrahend.

Now, 2's complement of 010110 is (101101 + 1) i.e. 101010. Adding this with the minuend.

	1	1	0	1	1	0	Minuend
	1	0	1	0	1	0	2's complement of subtrahend
Carry over 1	1	0	0	0	0	0	Result of addition

After dropping the carry over we get the result of subtraction to be 100000.

(ii) 10110 - 11010

Solution:

2's complement of 11010 is (00101 + 1) i.e. 00110. Hence

Minued -	1	0	1	1	0
2's complement of subtrahend -	0	0	1	1	0
Result of addition -	1	1	1	0	0

As there is no carry over, the result of subtraction is negative and is obtained by writing the 2's complement of 11100 i.e. (00011 + 1) or 00100.

Hence the difference is - 100.

(iii) 1010.11 – 1001.01

Solution:

2's complement of 1001.01 is 0110.11. Hence

$$\begin{array}{r} \text{Minued -} \quad 1010.11 \\ \text{2's complement of subtrahend -} \quad \underline{0110.11} \\ \text{Carry over} \quad 1 \quad 0001.10 \end{array}$$

After dropping the carry over we get the result of subtraction as 1.10.

(iv) 10100.01 – 11011.10

Solution:

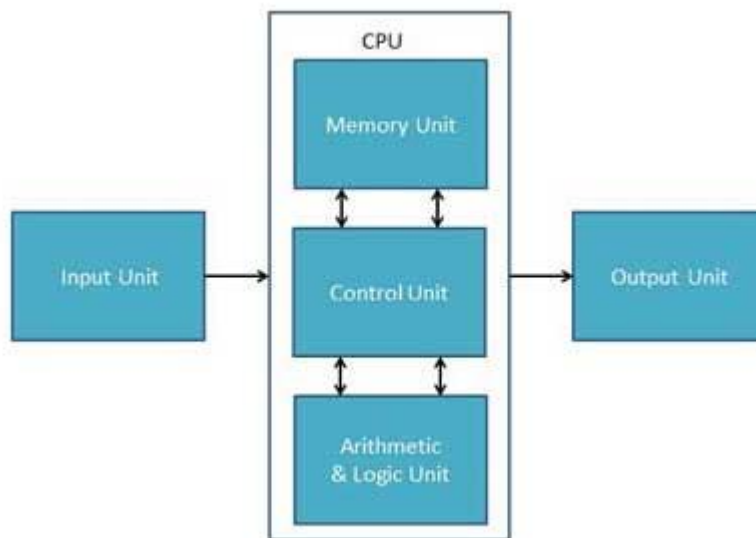
2's complement of 11011.10 is 00100.10. Hence

$$\begin{array}{r} \text{Minued -} \quad 10100.01 \\ \text{2's complement of subtrahend -} \quad \underline{01100.10} \\ \text{Result of addition -} \quad 11000.11 \end{array}$$

As there is no carry over the result of subtraction is negative and is obtained by writing the 2's complement of 11000.11.

Hence the required result is – 00111.01.

COMPONENTS OF A COMPUTER



The components of a computer include the following

Input unit :- The input unit is used to input data into the computer. Keyboard is an input device.

Processing unit :- The processing unit is used to process the data. CPU is a processing unit.

The CPU is comprised of 3 units

- a) **Memory unit /cache**:- :-During the time of processing raw data from the RAM some data from RAM is brought from the RAM to cache memory prior to processing to increase processing speed . This memory keeps on filling up and gets emptied by the control unit till all the instructions and raw data from the RAM get emptied. RAM on the other hand gets filled up with instructions and raw data from the virtual memory(A portion occupied in the hard disk)by the control unit till the program is completely executed.
- b) **Control Unit** :-It is responsible for controlling all parts of the computer.
 - Responsible in controlling the transfer of data and instructions among other units of a computer.
 - Responsible in managing and coordinating with all the units of the computer.

COMPUTER FUNDAMENTALS

- Gets instructions from the memory, interprets them, and accordingly directs the operation of the computer.
 - Responsible in communication with Input/Output devices for transfer of data or results from storage.
 - Does not process or store data.
- c) **Arithmetic And Logic Unit** :-Arithmetic and logic section is comprised of 2 units. They are arithmetic section and logic section.
- Arithmetic unit :- Arithmetic section is used to perform all arithmetic operation namely addition, subtraction, multiplication, division.
 - Logic Unit :- Logic unit is used to perform all logic operations such as comparison ,selection , matching and merging of data.

Output unit:- Output unit is a devise which generates the output. Example :- Printer

Other units to discuss

- a) **Secondary Storage**:- the secondary storage comprises of data that is very large in nature. Hard Disk is an example secondary storage device
- b) **Virtual memory**. When the program is too large to be executed in the memory the entire program does not load but only a portion of it which is to be executed comes to the RAM and the rest of it is stored in the hard disk in the form of virtual memory. The process is called paging.
- c) **External Storage** :-External data is a storage devise to store data externally for the following reasons.
- I. Easy data migration.
 - II. Vital Data remains safe in case computer crashes and everything can be rebuilt in less time by the process called restoration.
 - III. It helps to store maximum data and keeps the computer drives empty to store data.

Examples of external storage are:

- I. **Pen drive:-** A pen drive/**USB flash drive**, also known under a variety of other names, ^[a] is a data storage device that includes **flash** memory with an integrated Universal Serial Bus (**USB**) interface. **USB flash drives** are typically removable and rewritable, and physically much smaller than an optical disc.It comes in 4GB,8GB,16GB,32GB,64 GB.
- II. **External Hard disk :-** An **external hard drive** is a portable storage device that can be attached to a computer through a **USB** or FireWire connection, or wirelessly. **External hard** drives typically have high

COMPUTER FUNDAMENTALS

storage capacities and are often used to back up computers or serve as a network **drive**. capacity 500 GB, 1 GB

- III. **Google Drive /Cloud storage** **Google Drive** is a file storage and synchronization service created by Google. It allows users to store files in the cloud, share files, and edit documents, spreadsheets, and presentations with collaborators. Google Drive encompasses Google Docs, Sheets, and Slides, an office suite that permits collaborative editing of documents, spreadsheets, presentations, drawings, forms, and more.

d) **SMPS :-** SMPS stands for **Switch Mode Power Supply**.

SMPS is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.

PC needs power of different voltage levels both +ve and -ve dc polarities. The requirement of these voltages are as defined below by the help of **SMPS**.

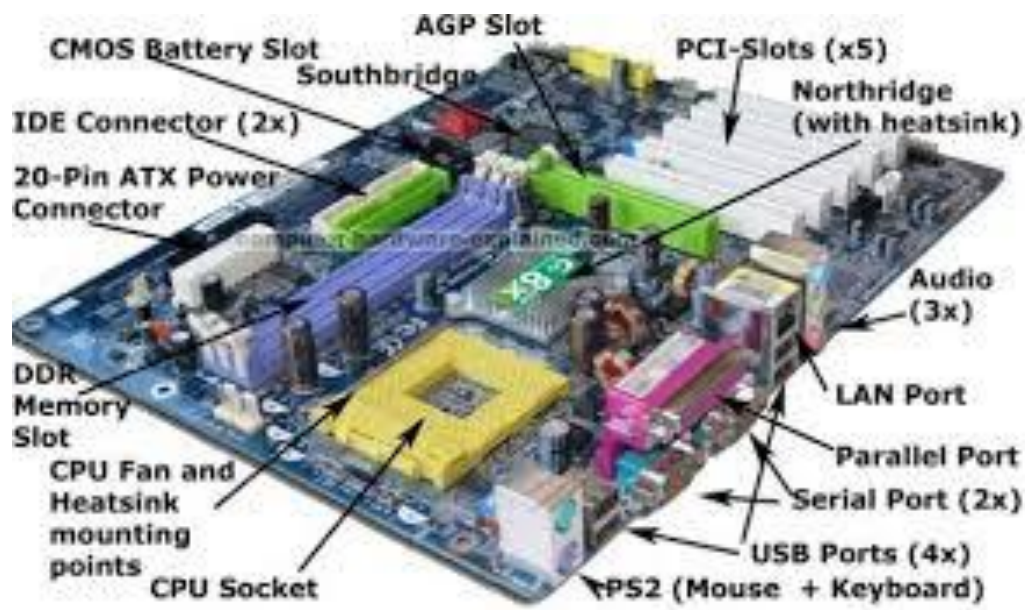
Volts	+ve	-ve	Use
12	+ve		Disk drive motors
5	+ve		Electronic circuit
5		-ve	Dynamic memory bias
12		-ve	232C serial port

Power Requirements of PC are as defined below

Sl.No	System component	Power Required
1	Motherboard	35W
2	Keyboard	2W
3	Floppy drive	5W{during idle}
		10W(during spinning)
4	Hard Disk Drive	35W
5	Multi I/O Card	4W
6	Floppy/Hard disk drive controller	8W
7	Display adapter	5W

COMPUTER FUNDAMENTALS

Motherboard :-



COMPUTER FUNDAMENTALS

Motherboard/main board of the PC is a large printed circuit that holds many of the most essential parts of the computer which are

1. Microprocessor
2. North Bridge
 - a. RAM
 - b. CPU
 - i. CACHE MEMORY
 - ii. ALU
 - iii. CONTROL UNIT
 - c. CPU Fan And Heat Sink Mounting Points
 - d. AGP SLOT
 - e. Heat Sink
3. South bridge
 - a. BIOS/EPROM
 - b. ROM
 - c. I/O
 - d. PCI
 - e. EIDE
 - f. USB
4. Chipset
5. 20 pin ATX Power Connector
6. CHOS Battery Slots
7. PS2 Port(Mouse +Keyboard)
8. Parallel ports
9. Serial Ports
10. LAN Ports
11. Audio Port
12. IDE Connector
13. Other connected devises like
 - a. Printers
 - b. Hard Disks
 - c. CD-ROMS

NORTH BRIDGE

RAM /Primary Storage :-This is a volatile memory where raw data is brought by the processing unit from processing from the secondary device or the input device and the processed data is temporarily stored before sending it to secondary storage or the output device. RAM (Random Access Memory) is an example of primary storage device.

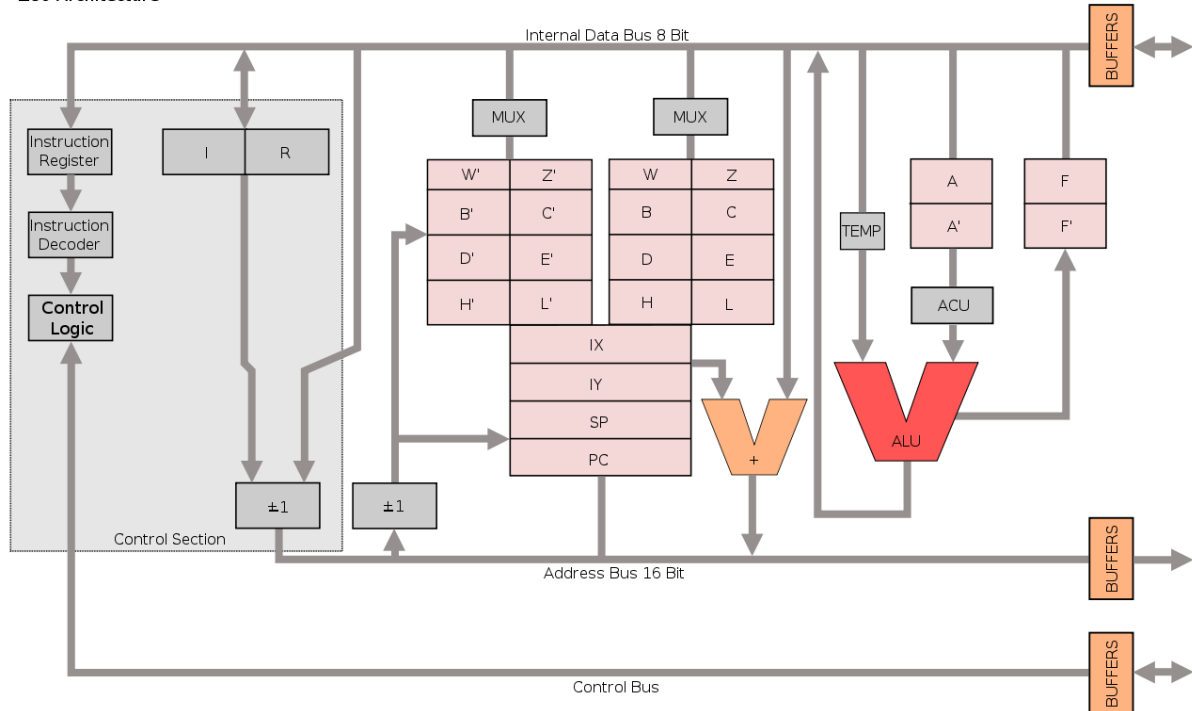
Microprocessor/CPU :- A **microprocessor** is a computer processor that incorporates the functions of a computer's central processing unit (CPU) on a single integrated circuit (IC), or at most a few integrated circuits.



The internal arrangement of a **microprocessor** varies depending on the age of the design and the intended purposes of the microprocessor. The complexity of an integrated circuit is bounded by physical limitations of the number of [transistors](#) that can be put onto one chip, the number of package terminations that can connect the processor to other parts of the system, the number of interconnections it is possible to make on the chip, and the heat that the chip can dissipate. Advancing technology makes more complex and powerful chips feasible to manufacture.

COMPONENTS OF MICROPROCESSOR

Z80 Architecture



Arithmetic logic unit (ALU). The ALU performs operations such as addition, subtraction, and operations such as AND or OR. Each operation of the ALU sets one or more flags in a status register, which indicate the results of the last operation (zero value, negative number, overflow, or others).

The control unit retrieves instruction operation codes from memory, and initiates whatever sequence of operations of the ALU requires to carry out the instruction. A single operation code might affect many individual data paths, registers, and other elements of the processor.

As integrated circuit technology advanced, it was feasible to manufacture more and more complex processors on a single chip. The size of data objects became larger; allowing more transistors on a chip allowed word sizes to increase from [4-](#) and [8-bit](#) words up to today's [64-bit](#) words. Additional features were added to the processor architecture; more on-chip registers sped up programs, and complex instructions could be used to make more compact programs. Floating-point arithmetic, for example, was often not available on 8-bit microprocessors, but had to be carried out in software. Integration of the [floating point unit](#) first as a separate integrated circuit and then as part of the same microprocessor chip, sped up floating point calculations.

Occasionally, physical limitations of integrated circuits made such practices as a [bit slice](#) approach necessary. Instead of processing all of a long word on one integrated circuit,

COMPUTER FUNDAMENTALS

multiple circuits in parallel processed subsets of each data word. While this required extra logic to handle, for example, carry and overflow within each slice, the result was a system that could handle, for example, [32-bit](#) words using integrated circuits with a capacity for only four bits each.

With the ability to put large numbers of transistors on one chip, it becomes feasible to integrate memory on the same die as the processor.

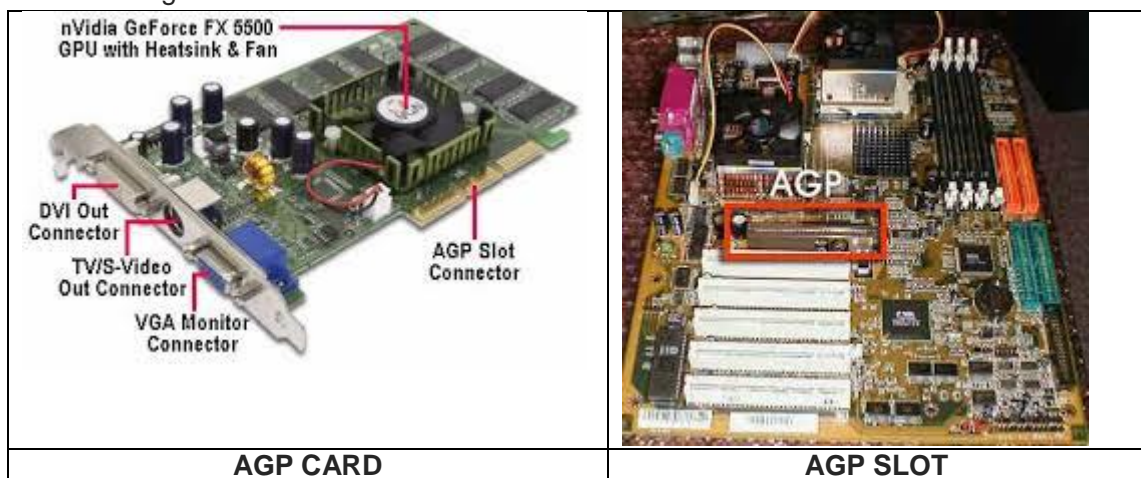
Cache Memory :- This [CPU cache](#) has the advantage of faster access than off-chip memory, and increases the processing speed of the system for many applications. Data is stored and processed in registers. Processor clock frequency has increased more rapidly than external memory speed, except in the recent past, so cache memory is necessary if the processor is not delayed by slower external memory.

2. **CPU Fan And Heat Sink Mounting Points** :- The CPU Fan and Heat Sink are mounted on the CPU to remove the heat from the CPU. When the CPU works a lot of heat is generated and this heat has to be removed and this is done by the CPU fan and the sink mounting points.



CPU FAN WITH HEAT SINK

AGP(Accelerated Graphics Port) Slot :- This slot is used to attach AGP Cards a high-speed point-to-point channel for attaching a [video card](#) to a [computer](#) system, primarily to assist in the acceleration of [3D computer graphics](#). It was originally designed as a successor to [PCI](#)-type connections for video cards. The primary advantage of AGP over PCI is that it provides a dedicated pathway between the slot and the processor rather than sharing the PCI bus.

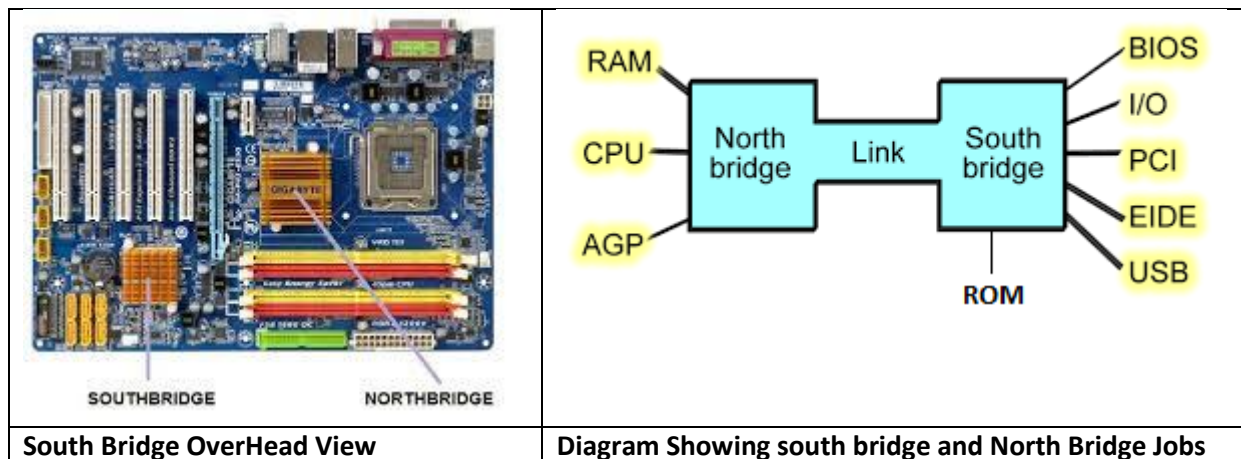


COMPUTER FUNDAMENTALS

HEAT SINK:- The role of the heat sink is to remove the high temperature of the mother generated due to high speed processing and give a cooling effect to the motherboard to work efficiently and effectively.




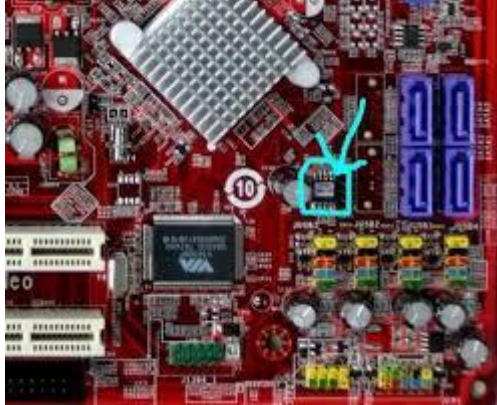

3. **South Bridge:-** Southbridge is an Intel [chipset](#) that manages the basic forms of input/output ([I/O](#)) such as Universal Serial Bus ([USB](#)), [serial](#) , audio, Integrated Drive Electronics ([IDE](#)), and Industry Standard Architecture ([ISA](#)) I/O in a computer.



COMPUTER FUNDAMENTALS

The Southern Bridge manages the following devices as defined below

BIOS(Basic Input Output System)/EPROM:-

	
<p>Bios chips</p> 	<p>Bios Chips on MotherBoard</p>
<p>BIOS Setting</p>	

The BIOS software has a number of different roles, but its most important role is to load the operating system. When you turn on your computer and the microprocessor tries to execute its first instruction, it has to get that instruction from somewhere. It cannot get it from the operating system because the operating system is located on a hard disk, and the microprocessor cannot get to it without some instructions that tell it how. The BIOS provides those **instructions**. Some of the other common tasks that the BIOS performs include:

- A power-on self-test (POST) for all of the different hardware components in the system to make sure everything is working properly
- Activating other BIOS chips on different cards installed in the computer - For example, [SCSI](#) and graphics cards often have their own BIOS chips.
- Providing a set of low-level routines that the operating system uses to interface to different hardware devices - It is these routines that give the BIOS its name. They manage things like the [keyboard](#), the [screen](#), and the [serial](#) and [parallel ports](#), especially when the computer is booting.
- Managing a collection of settings for the [hard disks](#), clock, etc.

COMPUTER FUNDAMENTALS

The BIOS is special software that interfaces the major hardware components of your computer with the [operating system](#). It is usually stored on a [Flash memory](#) chip on the [motherboard](#), but sometimes the chip is another type of [ROM](#).

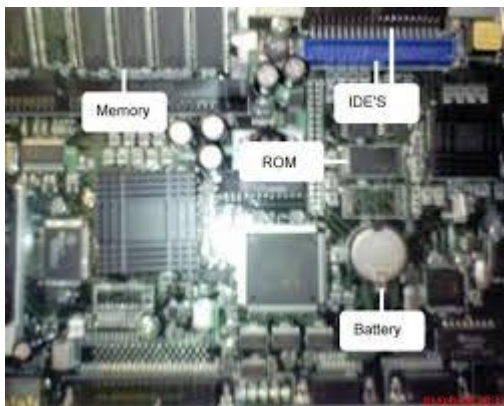
When you turn on your computer, the BIOS does several things. This is its usual sequence:

1. Check the CMOS Setup for custom settings
2. Load the interrupt handlers and device drivers
3. Initialize registers and power management
4. Perform the power-on self-test (POST)
5. Display system settings
6. Determine which devices are bootable
7. Initiate the bootstrap sequence

The first thing the BIOS does is check the information stored in a tiny (64 [bytes](#)) amount of RAM located on a **complementary metal oxide semiconductor** (CMOS) chip. The CMOS Setup provides detailed information particular to your system and can be altered as your system changes. The BIOS uses this information to modify or supplement its default programming as needed.

Setting Up The Bios :- To set up the bios Start the computer and press the del key repeatedly

Read Only Memory :- This is a non volatile memory that stores the instructions as how the computer should function.



I/O(Input Output System):-

input/output or **I/O** (or, informally, **io** or **IO**) is the communication between an [information processing system](#), such as a [computer](#), and the outside world, possibly a human or another information processing system. [Inputs](#) are the signals or data received by the system and outputs are the signals or [data](#) sent from it. The term can also be used as part of an action; to "perform I/O" is to perform an [input or output operation](#). I/O devices are used by a human (or other system) to communicate with a computer. For instance, a [keyboard](#) or [mouse](#) is an input device for a computer, while [monitors](#) and [printers](#) are output devices. Devices for communication between computers, such as [modems](#) and [network cards](#), typically perform both input and output operations.

COMPUTER FUNDAMENTALS

Note that the designation of a device as either input or output depends on perspective. Mice and keyboards take physical movements that the human user outputs and convert them into input signals that a computer can understand; the output from these devices is the computer's input. Similarly, printers and monitors take signals that a computer outputs as input, and they convert these signals into a representation that human users can understand. From the human user's perspective, the process of reading or seeing these representations is receiving input; this type of interaction between computers and humans is studied in the field of [human-computer interaction](#).

In computer architecture, the combination of the [CPU](#) and [main memory](#), to which the CPU can read or write directly using individual [instructions](#), is considered the brain of a computer. Any transfer of information to or from the CPU/memory combo, for example by reading data from a [disk drive](#), is considered I/O. The CPU and its supporting circuitry may provide [memory-mapped I/O](#) that is used in low-level [computer programming](#), such as in the implementation of [device drivers](#), or may provide access to [I/O channels](#). An [I/O algorithm](#) is one designed to exploit locality and perform efficiently when exchanging data with a secondary storage device, such as a disk drive.

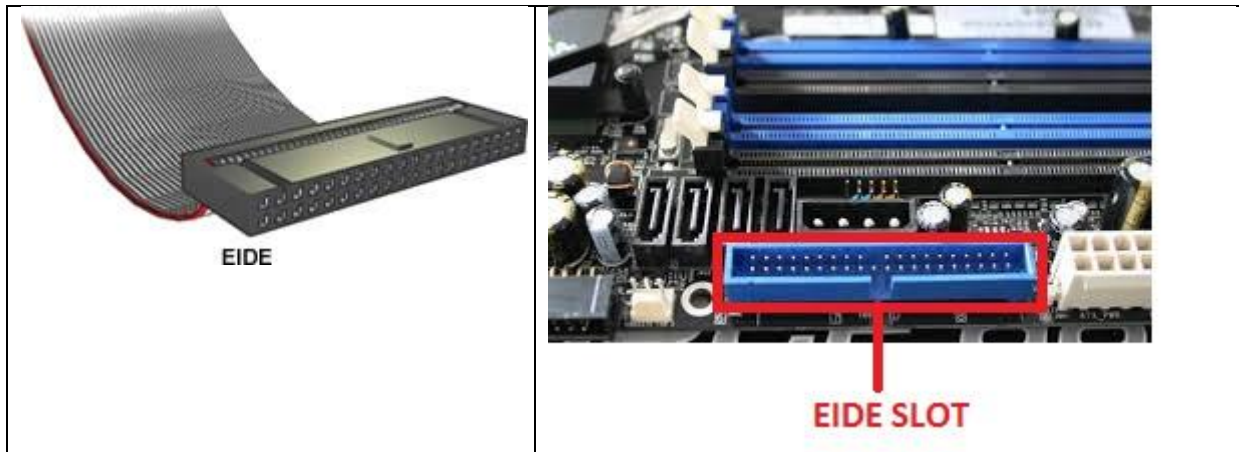
PCI (Peripheral Component Interconnect) :-



The **P**eripheral **C**omponent **I**nterconnect slots, commonly known as the **PCI slots**, refers to a computer bus. The computer bus is used by the computer to connect to peripheral add-on devices, such as a [pci video card](#), network cards, sound cards, tv tuners, firewire cards, graphics cards and many other types of extension cards.

EIDE:-

COMPUTER FUNDAMENTALS



Enhanced (sometimes "Expanded") IDE is a standard electronic interface between computer and its mass storage drives. EIDE's enhancements to Integrated Drive Electronics (IDE) make it possible to address a hard disk larger than 528 Mbytes. EIDE also provides faster access to the hard drive, support for Direct Memory Access ([DMA](#)), and support for additional drives, including CD-ROM and tape devices through the AT Attachment Packet Interface. When updating your computer with a larger hard drive (or other drives), an EIDE "controller" can be added to computer in one of its [card slot](#).





USB (Universal Serial Bus):- USB, short for **Universal Serial Bus**, is an [industry standard](#) developed in the mid-1990s that defines the cables, connectors and [communications protocols](#) used in a [bus](#) for connection, communication, and power supply between [computers](#) and electronic devices.¹ It is currently developed by the [USB Implementers Forum](#).

USB was designed to standardize the connection of [computer peripherals](#) (including keyboards, [pointing devices](#), digital cameras, printers, [portable media players](#), [disk drives](#) and [network adapters](#)) to [personal computers](#), both to communicate and to supply [electric power](#). It has become commonplace on other devices, such as [smartphones](#), [PDAs](#) and [video game consoles](#).^[3] USB has effectively replaced a variety of earlier interfaces, such as [serial](#) and [parallel ports](#), as well as separate [power chargers](#) for portable devices.

USB PORTS	
MALE PORTS	FEMALE PORTS

COMPUTER FUNDAMENTALS

	
USB-A -MALE	USB-A-FEMALE
	
USB-A-MALE(MINI)	USB-A-FEMALE(MINI)
	
USB-A-MALE(MICRO)	USB-A-FEMALE(MICRO)

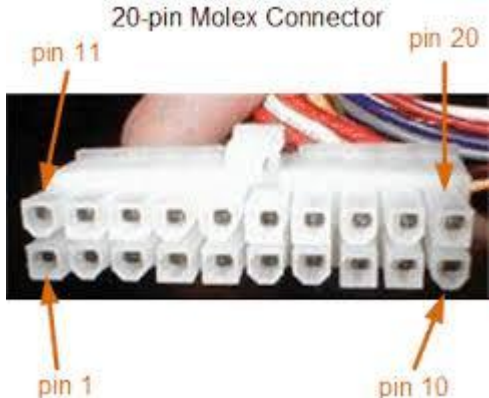

PORTS	
MALE PORTS	FEMALE PORTS
	
USB-B-MALE	USB-B-FEMALE
	

COMPUTER FUNDAMENTALS

USB-B-MALE(MINI)	USB-B-FEMALE(MINI)
	
USB-B-MALE(MICRO)	USB-B-FEMALE(MICRO)
	
USB-C-MALE	USB-C-FEMALE

Chipset:- In a computer system, a **chipset** is a set of electronic components in an integrated circuit that manages the data flow between the processor, memory and peripherals. It is usually found on the **motherboard**. **Chipsets** are usually designed to work with a specific family of microprocessors. In computing, the term *chipset* commonly refers to a set of specialized chips on a computer's motherboard or an expansion card.

20 pin ATX Power Connector?:- A Connector From SMPS (SWITCH MODE POWER SUPPLY) to Power up The Motherboard.

	
ATX POWER CONNECTOR PIN DIAGRAM	ATX POWER CONNECTOR CONNECTED TO MOTHER BOARD

CMOS Battery Slots :- What is CMOS?

CMOS (complementary metal-oxide-semiconductor) is the term usually used to describe the small amount of memory on a computer motherboard that stores the BIOS settings.

CMOS CLEANING :- CMOS CLEARING is done to achieve the following

- I. Reset the settings to factory settings
- II. Reset the password of the bios.

CMOS CLEARING can be done in 3 ways

1st Way :- The easiest way to clear the CMOS is to enter the BIOS setup utility and choose to **Reset BIOS Settings** to their factory default levels..

2nd Way :- Remove the CMOS battery for a minute and then replace it.

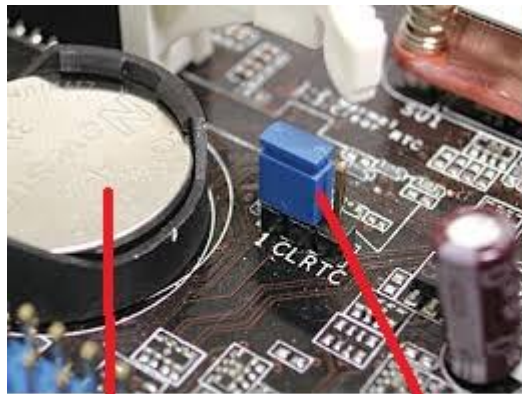
3rd Way :- Clear CMOS by changing the motherboard jumper.

Step -1 Switch off the computer .Unplug all supplies to it.

Step-2 Change motherboard jumper to pin labelled

COMPUTER FUNDAMENTALS

CLRPWD / PASSWORD / CLEAR / CLR



CMOS BATTERY JUMPER ON CLR


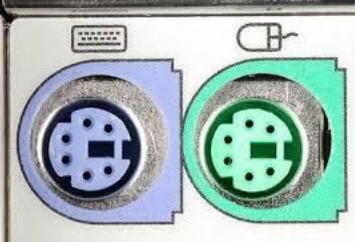

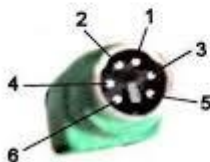
Step-3 Switch on the computer for resetting to take place.

Step-4 Switch off the computer.

Step-5 Reset the motherboard jumper

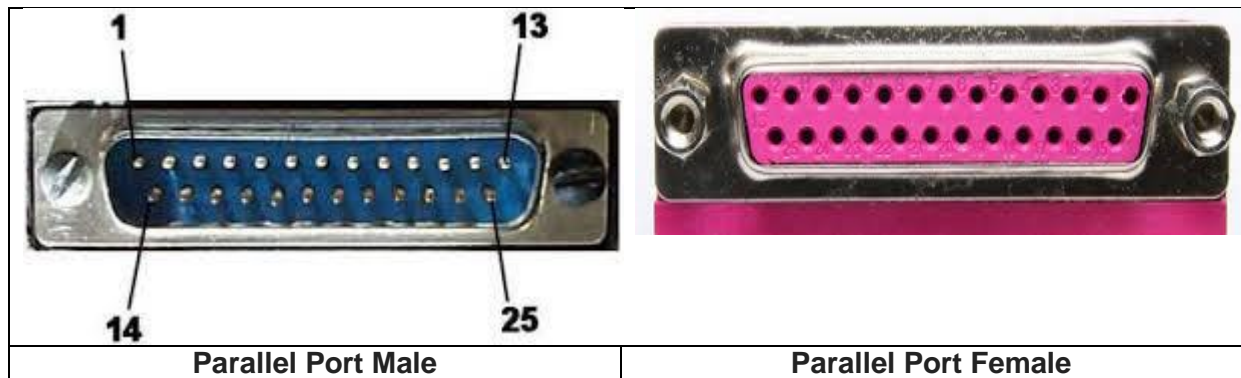
Step-6 Start the computer and press del key to enter bios settings.
Check if settings are changed. And change settings.

PS2 Port(Mouse + Keyboard):- The **PS/2** connector is a 6-pin mini-DIN connector used for connecting some keyboards and mice to a PC compatible computer system. Its name comes from the IBM Personal System/2 series of personal computers, with which it was introduced in 1987.

		  <div>Pin 1 =DATA Pin 2 Not connected Pin 3 GND Pin 4 Vcc Pin 5 =CLK Pin 6 Not connected</div>
PS2-MALE PORT	PS2 -FEMALE PORT	PS2 NEEDLE POSITIONS

Parallel Ports :- A **parallel port** is an interface allowing a personal computer (PC) to transmit or receive data down multiple bundled cables to a peripheral device such as a printer. The most common **parallel port** is a printer**port** known as the Centronics **port**.

COMPUTER FUNDAMENTALS



Serial Port:-

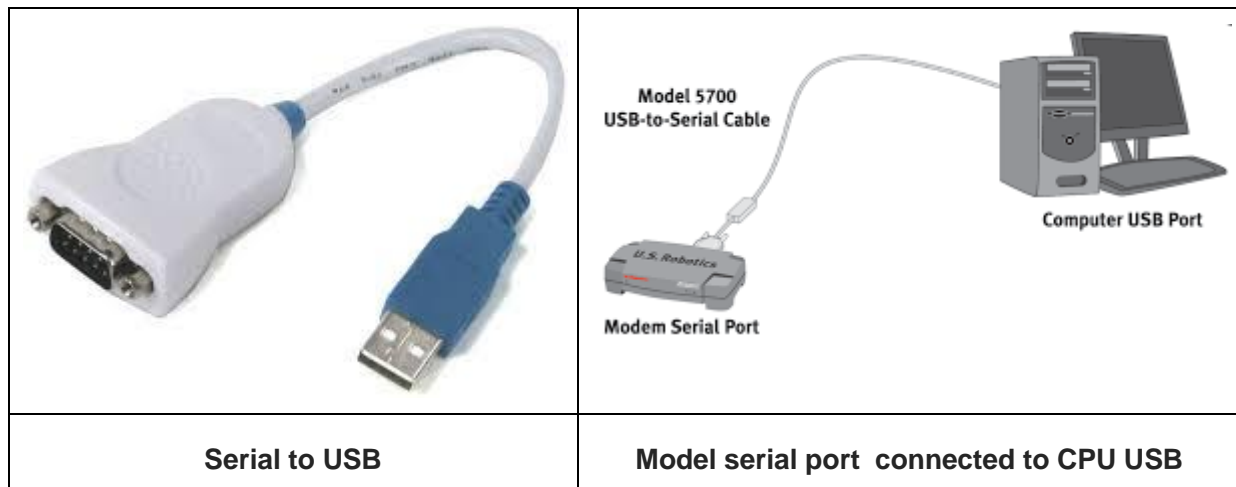


A **serial port** is a [serial communication](#) physical interface through which information transfers in or out one [bit](#) at a timeserial ports to devices such as modems, [terminals](#) and various peripherals.

While such interfaces as [Ethernet](#), [FireWire](#), and [USB](#) all send data as a serial [stream](#), the term "serial port" usually identifies hardware intended to interface with a [modem](#) or with a similar communication device.

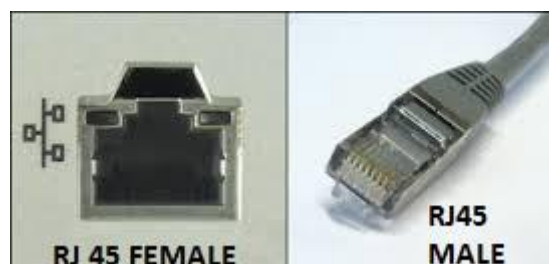
COMPUTER FUNDAMENTALS

Modern computers without serial ports may require serial-to-USB converters to allow compatibility with RS 232 serial devices such as modems.



Serial ports are still used in applications such as industrial automation systems, scientific instruments, point of sale systems and some industrial and consumer products. Server computers may use a serial port as a control console for diagnostics. Network equipment (such as routers and switches) often use serial console for configuration. Serial ports are still used in these areas as they are simple, cheap and their console functions are highly standardized and widespread. A serial port requires very little supporting software from the host system.

LAN PORTS :-LAN STANDS FOR LOCAL AREA NETWORK

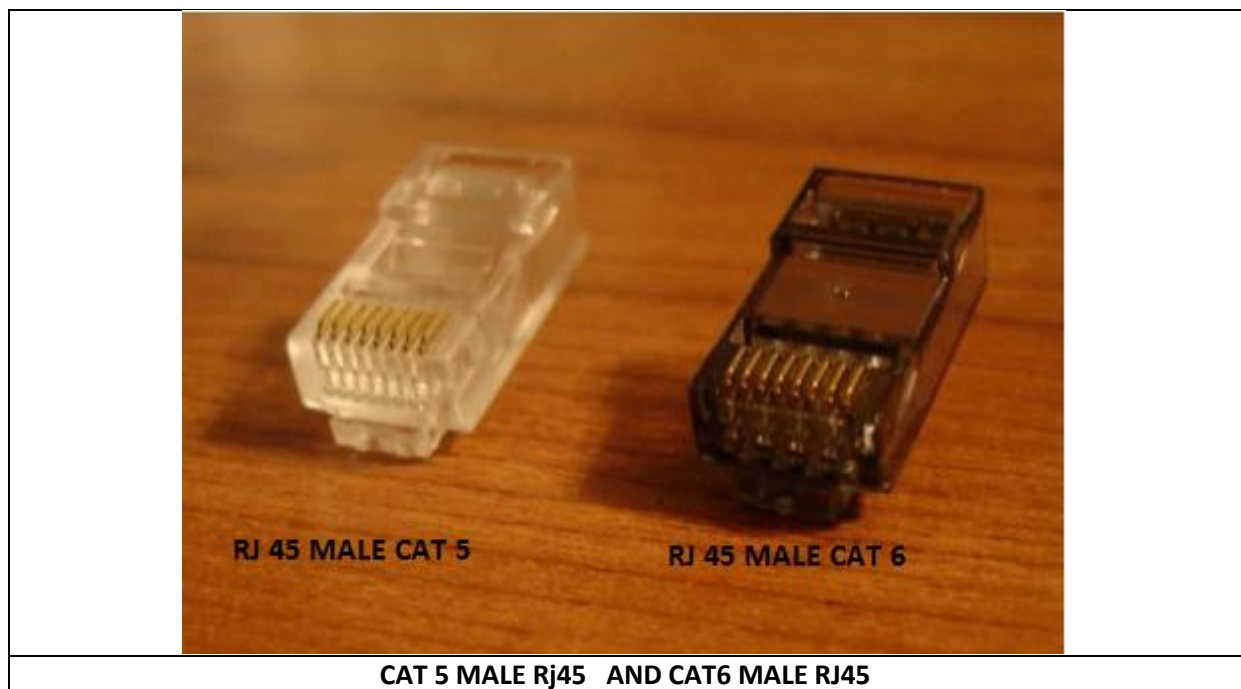


(Local Area Network **port**) An RJ-45 Ethernet socket on a computer or network device such as a switch or router. All client machines, servers and network devices on the **local network** are cabled together at their **LAN ports**.

COMPUTER FUNDAMENTALS







Rj45 are connected to cat 5/6 cables to prepare LAN cable,

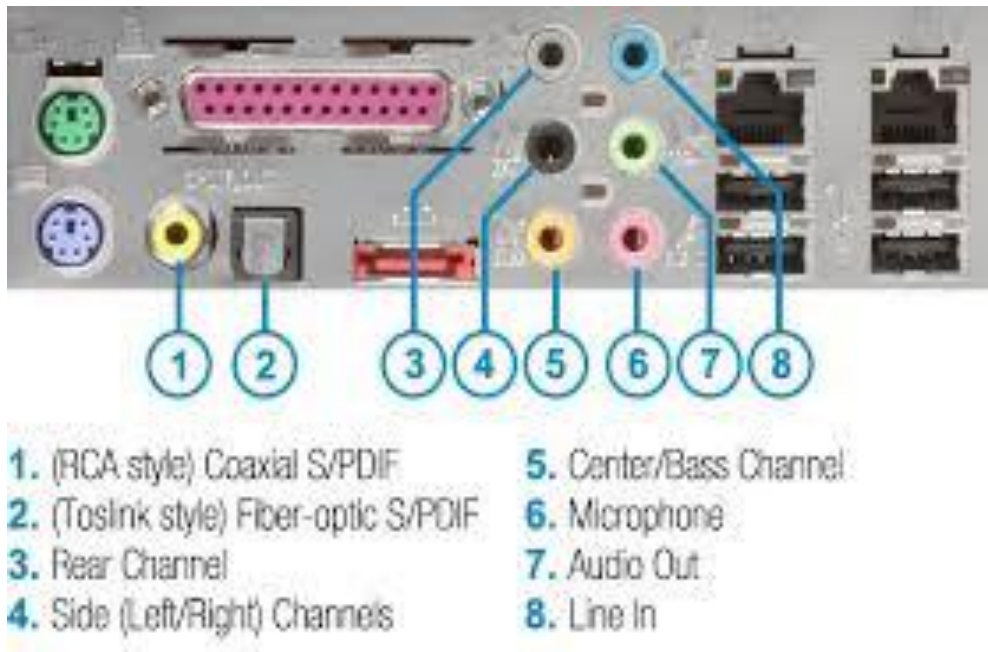


CAT 5 MALE Rj45 AND CAT6 MALE RJ45

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CAT -5 FEMALE	CAT -6 FEMALE
	
CAT-5 CABLE WITH CAT5 MALE RJ45 CONNECTOR	CAT-6 CABLE WITH CAT6 MALE R45 CONNECTOR

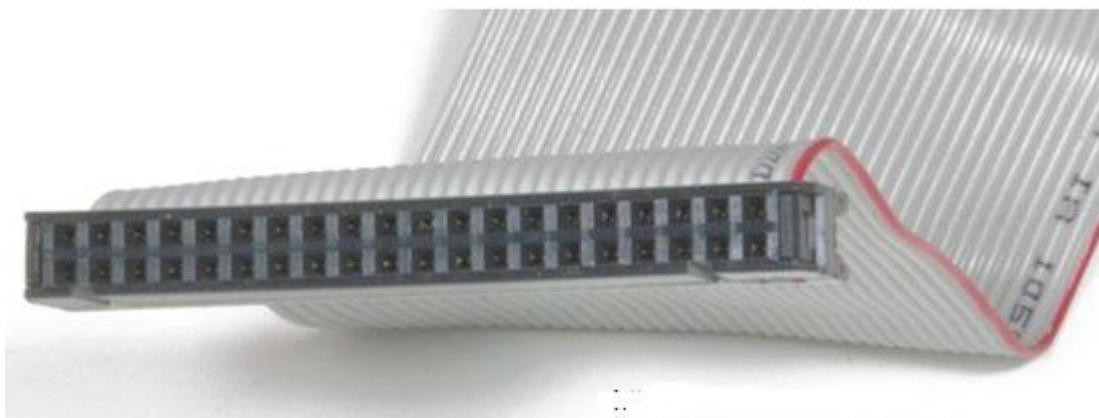
Audio Port :- Audio port is used to listen to music and make use of a microphone to transmit voice and sound into the system in order to record it.

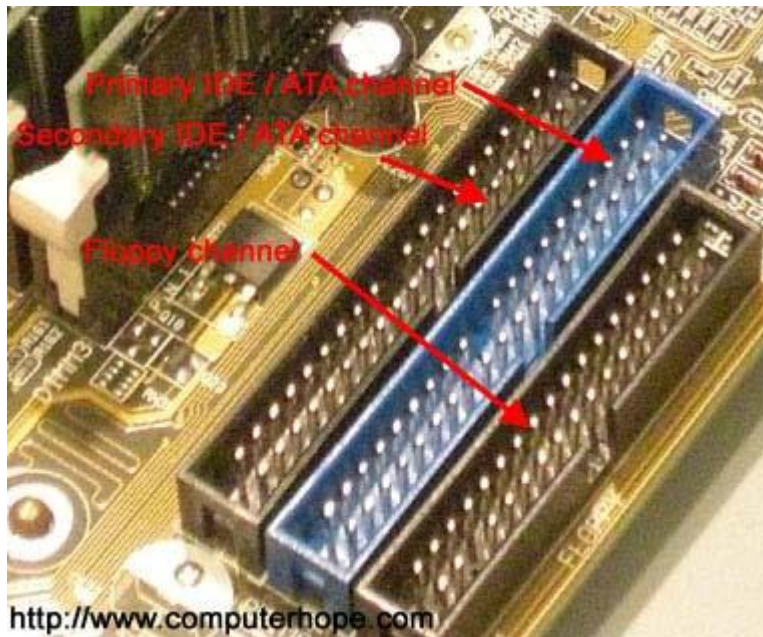


IDE Port :- Short for **Integrated Drive Electronics** or **IBM Disc**

Electronics, IDE is more commonly known as **ATA** or **Parallel ATA (PATA)**. It is a standard interface for IBM compatible hard drives and CD or DVD drives. IDE is different than **SCSI** and Enhanced Small Device Interface (ESDI) because its controllers are on each drive, meaning the drive can connect directly to the motherboard or controller. IDE and its updated successor, Enhanced IDE (EIDE), are common drive interfaces found in IBM compatible computers. Below is a picture of the IDE connector on the back of a hard drive, a picture of what an IDE cable looks like, and the IDE channels it connects to on the motherboard.

40-Pin IDE IDC Connector and cable





Other Connected Devices :- The other Connected Devices are

- a. _Printers
- b. Hard Disks
- c. CD-ROMS
- d. DVD WRITERS

a. Printers :- Printers are used to output data as a hard copy. Printers are classified into 2 types

1. **Impact printers :-** **Impact printer** refers to a class of **printers** that work by banging a head or needle against an ink ribbon to make a mark on the paper. This includes **dot-matrix printers**, daisy-wheel **printers**, and line **printers**.

2. **Non-Impact Printers :-** A type of **printer** that does not operate by striking a head against a ribbon. Examples of **nonimpact printers** include laser and ink-jet **printers**.

b.Hard Disks :- A hard disk drive (HDD), hard disk, hard drive or fixed disk^[b] is a **data storage device** used for storing and retrieving **digital** information using one or more rigid ("hard") rapidly rotating disks (**platters**) coated with magnetic material. The platters are paired with **magnetic heads** arranged on a moving **actuator** arm, which read and write data to the platter surfaces.^[2] Data is accessed in a **random-access** manner, meaning that individual **blocks** of data can be stored or retrieved in any order rather than **sequentially**. HDDs **retain stored data** even when powered off.



Introduced by **IBM** in 1956,^[3] HDDs became the dominant **secondary storage** device for **general-purpose computers** by the early 1960s. The primary characteristics of an HDD are its capacity and **performance**. Capacity is specified in **unit prefixes** corresponding to powers of 1000: a 1-**terabyte** (TB) drive has a capacity of 1,000 **gigabytes** (GB; where 1 gigabyte = 1 billion **bytes**). Typically, some of an HDD's capacity is unavailable to the user because it is used by the **file system** and the computer **operating system**, and possibly inbuilt redundancy for **error correction** and recovery. Performance is specified by the time required to move the heads to a track or cylinder (average access time) plus the time it takes for the desired sector to move under the head (average **latency**, which is a function of the physical **rotational speed** in **revolutions per minute**), and finally the speed at which the data is transmitted (data rate).

The two most common **form factors** for modern HDDs are 3.5-inch, for desktop computers, and 2.5-inch, primarily for laptops. HDDs are connected to systems by standard **interface** cables such as **PATA** (Parallel ATA), **SATA** (Serial ATA), **USB** or SAS (**Serial attached SCSI**) cables.

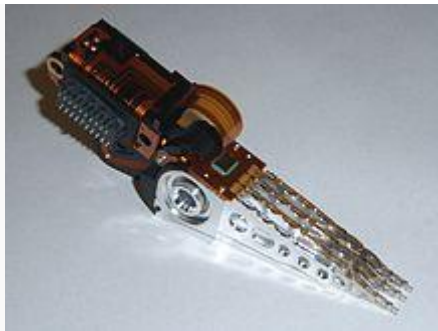
How it works :- An HDD records data by magnetizing a thin film of **ferromagnetic** material. A typical HDD design consists of a *spindle* that holds flat circular disks, also called **platters**, which hold the recorded data. The platters are made from a non-magnetic material, usually aluminium alloy, glass, or ceramic, and are coated with a shallow layer of magnetic material typically 10–20 **nm** in depth, with an outer layer of carbon for protection. For reference, a standard piece of copy paper is 0.07–0.18 millimeters (70,000–180,000 nm).

Components



HDD with disks and motor hub removed exposing copper colored stator coils surrounding a bearing in the center of the spindle motor. Orange stripe along the side of the arm is thin printed-circuit cable, spindle bearing is in the center and the actuator is in the upper left

A typical HDD has two electric motors; a spindle motor that spins the disks and an actuator (motor) that positions the read/write head assembly across the spinning disks. The disk motor has an external rotor attached to the disks; the stator windings are fixed in place. Opposite the actuator at the end of the head support arm is the read-write head; thin printed-circuit cables connect the read-write heads to amplifier electronics mounted at the pivot of the actuator. The head support arm is very light, but also stiff; in modern drives, acceleration at the head reaches 550 *g*.



Head stack with an actuator coil on the left and read/write heads on the right

The *actuator* is a permanent magnet and moving coil motor that swings the heads to the desired position. A metal plate supports a squat neodymium-iron-boron (NIB) high-flux magnet. Beneath this plate is the moving coil, often referred to as the *voice coil* by analogy to the coil in loudspeakers, which is attached to the actuator hub, and beneath that is a second NIB magnet, mounted on the bottom plate of the motor (some drives only have one magnet).

The voice coil itself is shaped rather like an arrowhead, and made of doubly coated copper magnet wire. The inner layer is insulation, and the outer is thermoplastic, which bonds the coil together after it is wound on a form, making it self-supporting. The portions of the coil along the two sides of the arrowhead (which point to the actuator bearing center) interact with the magnetic field, developing a tangential force that rotates the actuator. Current flowing radially outward

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along one side of the arrowhead and radially inward on the other produces the **tangential force**. If the magnetic field were uniform, each side would generate opposing forces that would cancel each other out. Therefore, the surface of the magnet is half north pole and half south pole, with the radial dividing line in the middle, causing the two sides of the coil to see opposite magnetic fields and produce forces that add instead of cancelling. Currents along the top and bottom of the coil produce radial forces that do not rotate the head.

The HDD's electronics control the movement of the actuator and the rotation of the disk, and perform reads and writes on demand from the **disk controller**. Feedback of the drive electronics is accomplished by means of special segments of the disk dedicated to servo feedback. These are either complete concentric circles (in the case of dedicated servo technology), or segments interspersed with real data (in the case of embedded servo technology). The servo feedback optimizes the signal to noise ratio of the GMR sensors by adjusting the voice-coil of the actuated arm. The spinning of the disk also uses a servo motor. Modern disk firmware is capable of scheduling reads and writes efficiently on the platter surfaces and remapping sectors of the media which have failed.

CD:- CD stands for compact disk. It comes in two types.

- a. **CD-R:-** It follows the principle of WORM(WRITE ONCE READ MANY)
- b. **Cd-R/W:-** It can be written as many times and read as many times. Erasing the entire disk and loading new data is possible.

DVD :- DVD stands for Digital Versatile disk. It is an digital optical disk storage which was developed in the year 1995 by Sony, Phillips, Toshiba and Panasonic to store data . Capacity ranges from 4.7GB /single density to 8.5GB/double density.

DVD-R:- It follows the principle of WORM(WRITE ONCE READ MANY)

DVD-R/W:- It can be written as many times and read as many times. Erasing the entire disk and loading new data is possible.

Computer Hardware :- Computer **hardware** is the collection of physical parts of a computer system. This includes the computer case, monitor, keyboard, and mouse. It also includes all the parts inside the computer case, such as the hard disk drive, motherboard, video card, and many others.

Computer Software :- **Software** is a general term for the various kinds of **programs** used to operate computers and related devices.

Data Data is distinct pieces of information, usually formatted in a special way. All software is divided into two general categories: *data* and *programs*. Programs are collections of instructions for manipulating data. Data can exist in a variety of forms -- as numbers or text on pieces of paper, as bits and bytes stored in electronic memory, or as facts stored in a person's mind.

Strictly speaking, data is the plural of *datum*, a single piece of information. In practice, however, people use *data* as both the singular and plural form of the word.

(2) The term *data* is often used to distinguish binary machine-readable information from textual human-readable information. For example, some applications make a distinction between *data files* (files that contain binary data) and *text files* (files that contain ASCII data).

(3) In database management systems, data files are the files that store the database information, whereas other files, such as index files and data dictionaries, store administrative information, known as metadata.

Intranet :- An **intranet** is a private network, accessible only to an organization's staff.



Uses :- Intranet is used in large organization MIS which incorporates all the activities of the company and all departments are linked to common server. Examples include

1. Large hospital MIS systems
2. Large Hotel MIS system
3. Military MIS

How it works :- An authorised user enters the intranet of the company by passing through 2 security gates namely Network Security, user check and verification.

Network Security :- This implies if he is entering the system through the computer which he/she is authorised to use. Here MAC address and IP address are checked and verified by the database located at the server. If these 2 match then the user is identified as an authorised user.

User check and verification :- User id and password along with secret code are matched to enter into the system. Any violation for 3 times locks the user and sends an alert to the system admin that someone is trying to enter into the system.

Benefits:-

- **Workforce productivity:** Intranets can help users to locate and view information faster and use applications relevant to their roles and responsibilities. With the help of a [web browser](#) interface, users can access data held in any database the organization wants to make available, anytime and — subject to security provisions — from anywhere within the company workstations, increasing employees' ability to perform their jobs faster, more accurately, and with confidence that they have the right information. It also helps to improve the services provided to the users.
- **Time:** Intranets allow organizations to distribute information to employees on an *as-needed* basis; Employees may link to relevant information at their convenience, rather than being distracted indiscriminately by email.
- **Communication:** Intranets can serve as powerful tools for communication within an organization, vertically strategic initiatives that have a global reach throughout the organization. The type of information that can easily be conveyed is the purpose of the initiative and what the initiative is aiming to achieve, who is driving the initiative, results achieved to date, and who to speak to for more information. By providing this information on the intranet, staff have the opportunity to keep up-to-date with the strategic focus of the organization. Some examples of communication would be chat, email, and/or blogs
- **Web publishing** allows cumbersome corporate knowledge to be maintained and easily accessed throughout the company using [hypermedia](#) and Web technologies.^[9] Examples include: employee manuals, benefits documents, company policies, business standards, news feeds, and even training, can be accessed using common Internet standards (Acrobat files, Flash files, CGI applications). Because each business unit can update the online copy of a document, the most recent version is usually available to employees using the intranet.
- **Business operations and management:** Intranets are also being used as a platform for developing and deploying applications to support business operations and decisions across the internetworked enterprise.^[9]

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- **Cost-effective:** Users can view information and data via web-browser rather than maintaining physical documents such as procedure manuals, internal phone list and requisition forms. This can potentially save the business money on printing, duplicating documents, and the environment as well as document maintenance overhead. For example, the HRM company PeopleSoft "derived significant cost savings by shifting HR processes to the intranet".^[8] McGovern goes on to say the manual cost of enrolling in benefits was found to be USD109.48 per enrollment. "Shifting this process to the intranet reduced the cost per enrollment to \$21.79; a saving of 80 percent". Another company that saved money on expense reports was Cisco. "In 1996, Cisco processed 54,000 reports and the amount of dollars processed was USD19 million".^[8]
- **Enhance collaboration:** Information is easily accessible by all authorised users, which enables teamwork.^[9]
- **Cross-platform capability:** Standards-compliant web browsers are available for Windows, Mac, and UNIX.
- **Built for one audience:** Many companies dictate computer specifications which, in turn, may allow Intranet developers to write applications that only have to work on one browser (no cross-browser compatibility issues). Being able to specifically address your "viewer" is a great advantage. Since Intranets are user-specific (requiring database/network authentication prior to access), you know exactly who you are interfacing with and can personalize your Intranet based on role (job title, department) or individual ("Congratulations Jane, on your 3rd year with our company!").
- **Promote common corporate culture:** Every user has the ability to view the same information within the Intranet.
- **Immediate updates:** When dealing with the public in any capacity, laws, specifications, and parameters can change. Intranets make it possible to provide your audience with "live" changes so they are kept up-to-date, which can limit a company's liability.^[9]
- **Supports a distributed computing architecture:** The intranet can also be linked to a company's management information system, for example a time keeping system.

Internet

The **Internet** is a global network connecting millions of computers. More than 190 countries are linked into exchanges of data, news and opinions. ... The **Internet** is a massive network of networks, a networking infrastructure. It uses various internet protocol technologies.

Uses of Internet

The key to success of Internet is the information. The better the quality, the more usage of Internet operations.

Large volume of Information: Internet can be used to collect information from around the world. This information could relate to education, medicine, literature, software, computers, business,

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entertainment, friendship and leisure. People can search for information by visiting the home page of various search engines such as Google, Yahoo, Bing, etc.

News and Journals: All the newspapers, magazines and journals of the world are available on the Internet. With the introduction of broadband and 3G services, the speed of internet service has increased tremendously. A person can get the latest news about the world in a matter of few minutes.

Electronic Mode of Communication: Internet has given the most exciting mode of communication to all. We can send an E-mail (the short form of Electronic Mailing System) to all the corners of the world.

Chatting: There are many chatting software that can be used to send and receive real-time messages over the internet. We can chat with our friend and relatives using any one of the chatting software.

Social Networking: People can connect with old friends on social networking sites. They can even chat with them when they are online. People are even concluding business deals over these social networking sites such as Facebook.

Online Banking (Net-Banking): The use of internet can also be seen in the field of banking transactions. Many banks such as HSBC, SBI, Axis Bank, Hdfc Bank, etc. offers online banking facilities to its customers. They can transfer funds from one account to another using the net-banking facility.

E-commerce: Internet is also used for carrying out business operations and that set of operations is known as Electronic Commerce (E-commerce). Flipkart is the largest e-commerce company in India. The rival, Amazon, is giving stiff competition to Flipkart.

Mobile commerce: Mobile commerce (also M-Commerce) refers to the commercial transaction that takes place over the mobile internet. Using the mobile internet technology, many companies have introduced mobile version of websites and mobile apps, to promote and sell their products. Customers can simply browse several through the products and buy online through mobile internet.

Mobile wallet: Many companies offer the service of mobile wallet to its customers. Users must have a smart-phone and internet connection to use this service. Users can pay an amount into their mobile wallet, which they can use to make online payment such as bill payments, recharges, etc.

Entertainment: Apart from a major source of knowledge and information, the utility of Internet in the field of entertainment cannot be undermined. We can visit various video sites and watch movies and serials at our convenient time.

Technology of the Future: Internet is the technology of future. In the times to come, offices would be managed at distant places through Internet.

MS –DOS
MICROSOFT DISK OPERATING SYSTEM

MSDOS

What is an Operating System :- An **operating system (OS)** is **system** software that manages computer hardware and software resources and provides common services for computer programs. The **operating system** is a component of the **system** software in a computer **system**. Application programs usually require an **operating system** to function.



OPERATING SYSTEM IS CLASSIFIED INTO 2 CATEGORIES

1. **SINGLE USER OPERATING SYSTEM:-** The **operating system** is designed mainly with a single user in mind. The single user operating system is classified into 2 categories
 - a. Single Task Operating System :- Here a single task can be executed at one time only.
Example :- MS-DOS
 - b. Multi task operating System :- Here multiple tasks are executed simultaneously.
Example :- Windows (98, Me, xp, vista, 7).
2. **MULTI USER OPERATING SYSTEM :-** A multi-user operating system is a computer operating system (OS) that allows multiple users on different computers or terminals to access a single system with one OS on it. These programs are often quite complicated and must be able to properly manage the necessary tasks required by the different users connected to it. The users will typically be at terminals or computers that give them access to the system through a network, as well as other machines on the system such as printers. A multi-user operating system differs from a single-user system on a network in that each user is accessing the same OS at different machines.

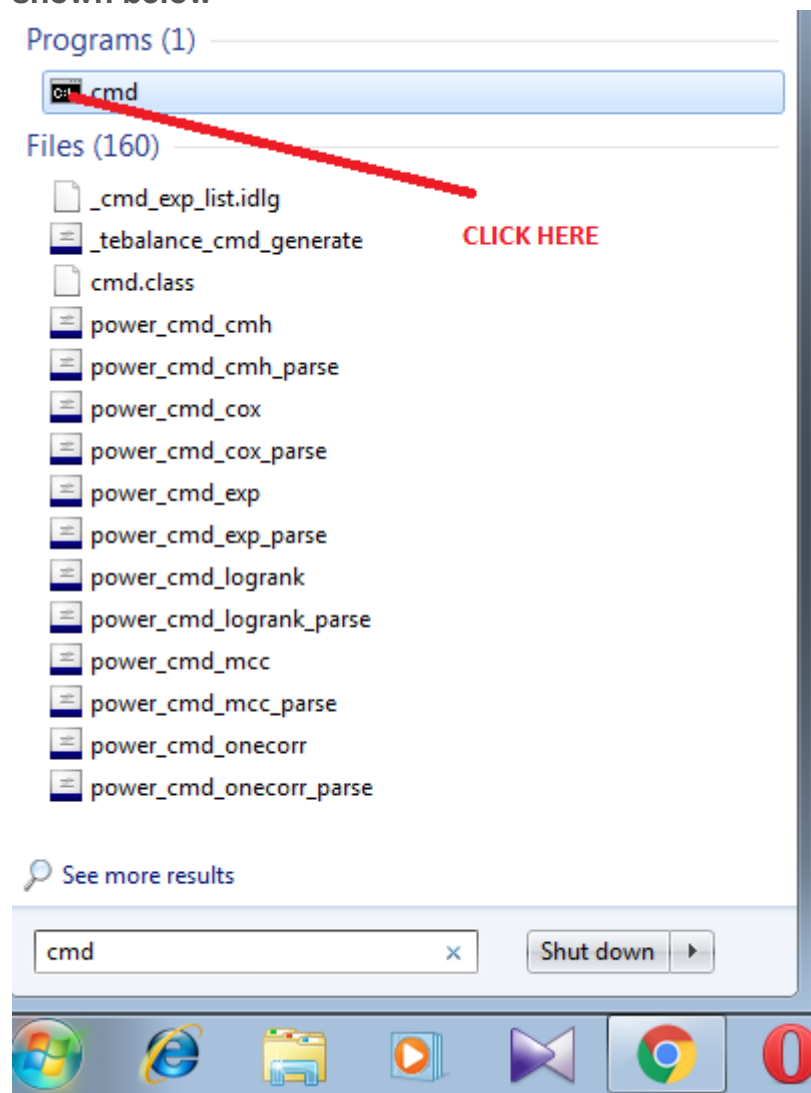
The operating system on a computer is one of the most important programs used. It is typically responsible for managing memory and processing for other applications and programs being run, as well as recognizing and using hardware connected to the system, and properly handling user interaction and data requests. On a system using a multi-user operating system this can be even more important, since multiple people require the system to be functioning properly simultaneously. Example (Windows 2000, 2008, 2012), LINUX, UNIX.

DIVING INTO MS DOS

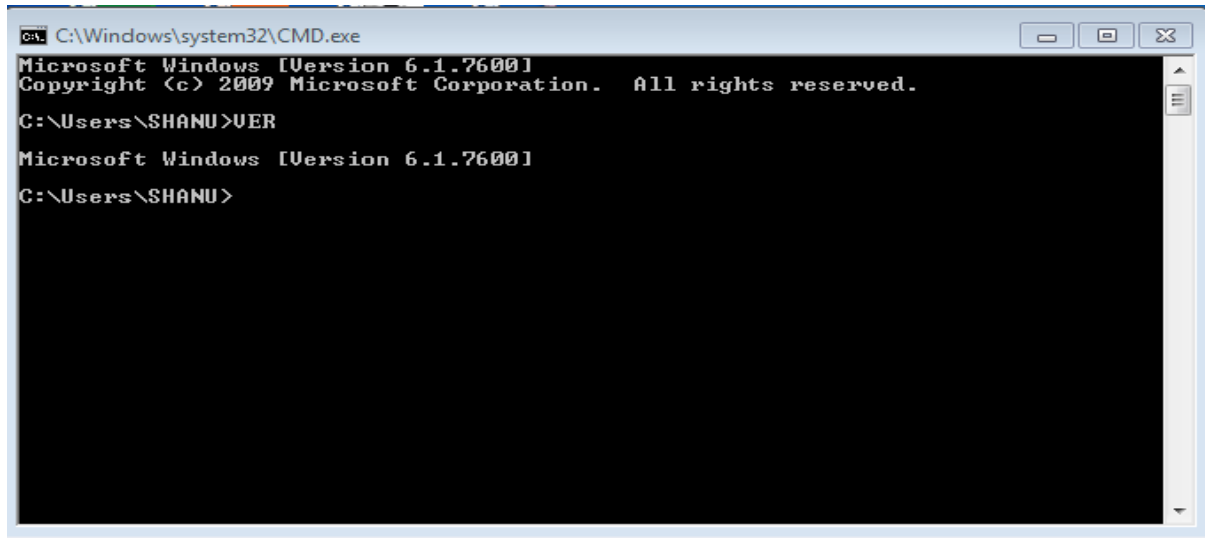
MS DOS is a single user Operating System:-

acronym for **Microsoft** Disk Operating System) is an operating system for x86-based personal computers mostly developed by **Microsoft**..

How To Start MSDOS :- If you are using windows7 type cmd in the search as shown below



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```
C:\Windows\system32\CMD.exe
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\SHANU>VER

Microsoft Windows [Version 6.1.7600]

C:\Users\SHANU>
```

DOS COMMANDS ARE CLASSIFIED INTO 2 TYPES

INTERNAL COMMANDS :- DOS commands for which the specifications are available in Shell (Command.com) are called internal commands. These are frequently used commands, and are called resident commands.

List Of Internal Commands

Assoc	For	Rd	Unlock
Atmadm	Goto	Ren	Ver
Break	If	Rename	Verify
Call	LH	Rmdir	Vol
CD	Loadhigh	Set	
Chdir	Lock	Setlocal	
Cls	Md	Shift	
Color	Mkdir	Start	
Copy	Mklink	Switches	
Ctty	Move	Time	
Date	Path	Title	
Del	Pause	Type	
Dir	Popd	Erase	
Drivparm	Prompt	Exit	
Echo	Pushd		
Endlocal			

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EXTERNAL COMMANDS:- An **external command** is an MS-DOS command that is not included in command.com. External commands are commonly external either because they require large requirements or are not commonly used commands. The illustration shows each of the external commands are their own separate files.

<u>Append</u>	<u>Edlin</u>	<u>Mwbackup</u>	<u>Systeminfo</u>
<u>Arp</u>	<u>Expand</u>	<u>Msd</u>	<u>Taskkill</u>
<u>Assign</u>	<u>Extract</u>	<u>Nbtstat</u>	<u>Tasklist</u>
<u>At</u>	<u>Fasthelp</u>	<u>Net</u>	<u>Telnet</u>
<u>Attrib</u>	<u>Fc</u>	<u>Netsh</u>	<u>Tracert</u>
<u>Backup</u>	<u>Fciv</u>	<u>Netstat</u>	<u>Tree</u>
<u>Bcdedit</u>	<u>Fdisk</u>	<u>Nlsfunc</u>	<u>Tskill</u>
<u>Bootsect</u>	<u>Find</u>	<u>Nslookup</u>	<u>Undelete</u>
<u>Cacls</u>	<u>Forfiles</u>	<u>Pathping</u>	<u>Unformat</u>
<u>Chcp</u>	<u>Format</u>	<u>Ping</u>	<u>Wmic</u>
<u>Chkdsk</u>	<u>FTP</u>	<u>Power</u>	<u>Xcopy</u>
<u>Chkntfs</u>	<u>Gpupdate</u>	<u>Print</u>	
<u>Choice</u>	<u>Graftabl</u>	<u>Reg</u>	
<u>Cipher</u>	<u>Help</u>	<u>Robocopy</u>	
<u>Comp</u>	<u>Hostname</u>	<u>Route</u>	
<u>Compact</u>	<u>ICacls</u>	<u>Runas</u>	
<u>Convert</u>	<u>Ipconfig</u>	<u>Scandisk</u>	
<u>Debug</u>	<u>Label</u>	<u>Scanreg</u>	
<u>Defrag</u>	<u>Loadfix</u>	<u>Schtasks</u>	
<u>Delpart</u>	<u>logoff</u>	<u>Setver</u>	
<u>Deltree</u>	<u>Mem</u>	<u>Sfc</u>	
<u>Diskcomp</u>	<u>Mode</u>	<u>Share</u>	
<u>Diskcopy</u>	<u>More</u>	<u>Shutdown</u>	
<u>Doskey</u>	<u>Move</u>	<u>Smartdrv</u>	
<u>Dosshell</u>	<u>Msav</u>	<u>Sort</u>	
<u>Dumpchk</u>	<u>Msbackup</u>	<u>Subst</u>	
	<u>Mscdex</u>	<u>Sys</u>	
	<u>Mscdexnt</u>		

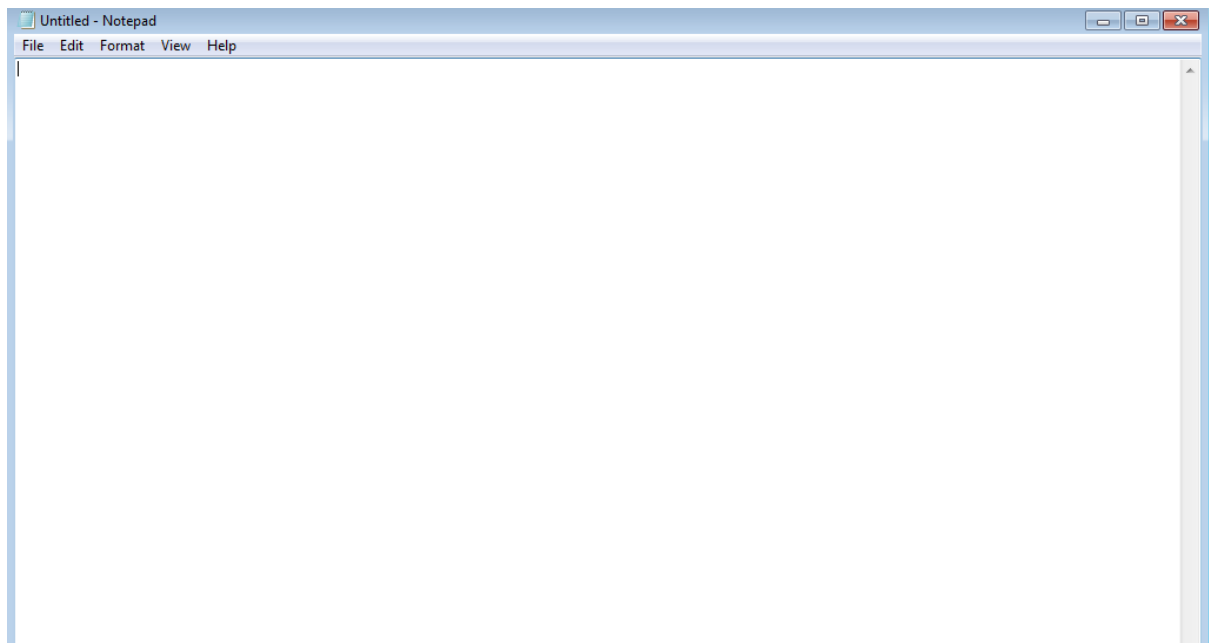
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To know the version of the dos you are using type `ver` at the command line

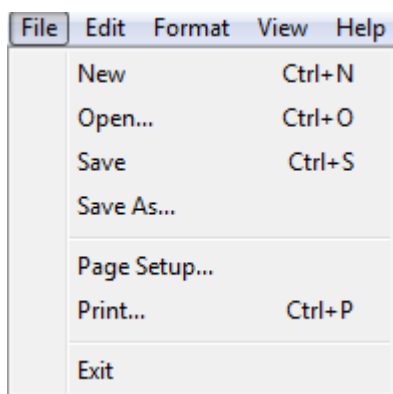
`C:\> ver`

To create a file use

`C:\>notepad`



Notepad comprises of the following components in the file menu



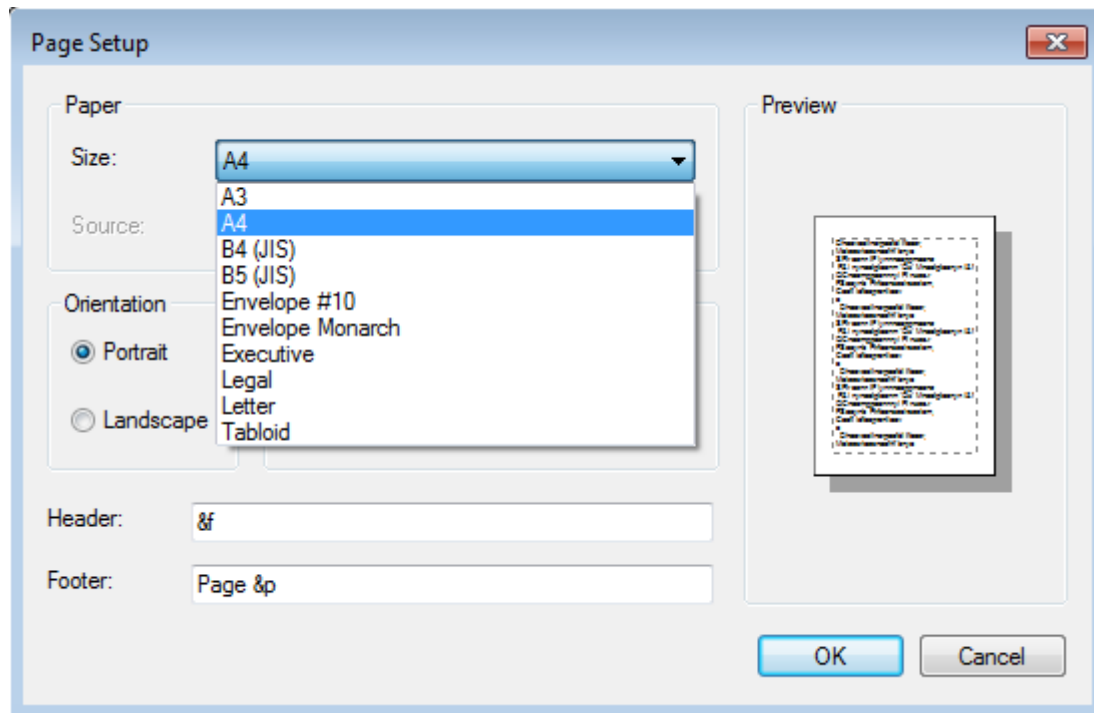
The New sub menu is used to create a new file.

The open sub menu is used to open an existing file.

The save sub menu is used to save an existing file.

The save As sub menu is used to save an existing file in another format

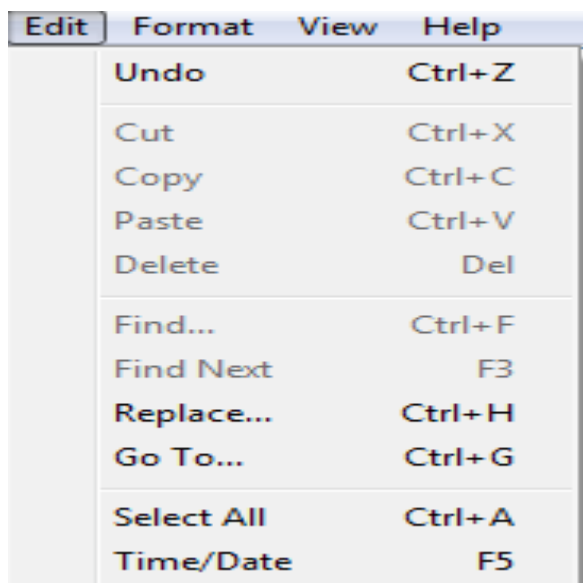
The Page setup as a sub menu is used to set the page setup as defined below



Here the size of the paper is defined as A4 ,B4,B5.

Here the printing type is defined as portrait /Landscape

The Edit option is used to edit the document



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It is used to

Undo :- Undo a document

Cut :- Cut a content from the document

Copy:- copy a content from the document

Paste :- Paste the document that was cut /copied

Delete :- delete the selection

Find :- Find a word

Find Next :- Find the word once again

Replace :- Replace the word with another word defined

Go To :- Go to a particular line

Select All:- Select the entire document

Time /Date :- used to insert date and time

Word Wrap :- Wrap a word

Font :- To change the font

View :- View the status bar

Help :- The help menu is used when the help menu is required

SWITCHING FROM ONE DRIVE TO THE OTHER

C:\>D: (PRESS ENTER KEY)

D:\>

CREATING A DIRECTORY/FOLDER

D:\> md myfolder

changing a to sub directory/folder

D:\> cd my folder

To know the contents of a directory/folder

D:\myfolder> DIR

To Know more about the DIR command type

D:\>DIR/?

Displays a list of files and subdirectories in a directory.

DIR [drive:][path][filename] [/A[:]attributes] [/B] [/C] [/D] [/L] [/N]

[/O[:]sortorder] [/P] [/Q] [/R] [/S] [/T[:]timefield] [/W] [/X] [/4]

[drive:][path][filename]

Specifies drive, directory, and/or files to list.

/A Displays files with specified attributes.

attributes D Directories R Read-only files

H Hidden files A Files ready for archiving

S System files I Not content indexed files

L Reparse Points - Prefix meaning not

/B Uses bare format (no heading information or summary).

/C Display the thousand separator in file sizes. This is the default. Use /-C to disable display of separator.

/D Same as wide but files are list sorted by column.

/L Uses lowercase.

/N New long list format where filenames are on the far right.

/O List by files in sorted order.

COMPUTER FUNDAMENTALS

sortorder **N** By name (alphabetic) **S** By size (smallest first)

E By extension (alphabetic) **D** By date/time (oldest first)

G Group directories first - Prefix to reverse order

/P Pauses after each screenful of information.

/Q Display the owner of the file.

/R Display alternate data streams of the file.

/S Displays files in specified directory and all subdirectories.

/T Controls which time field displayed or used for sorting

timefield **C** Creation

A Last Access

W Last Written

/W Uses wide list format.

/X This displays the short names generated for non-8dot3 file names. The format is that of **/N** with the short name inserted before the long name. If no short name is present, blanks are displayed in its place.

/4 Displays four-digit years

Switches may be preset in the **DIRCMD** environment variable. Override preset switches by prefixing any switch with - (hyphen)--for example, **/-W**.

COMPUTER FUNDAMENTALS

DELETE COMMAND

TO DELETE A FILE USE THE DEL COMMAND

D:\MYFOLDER\>DEL K.TXT (Delete K.TXT file)

D:\MYFOLDER\>DEL *.TXT (DELETES ALL FILES WITH EXTENSION .TXT)

D:\MYFOLDER\>DEL K*.*(DELETES ALL FILES STARTING WITH K)

Deletes one or more files.

DEL [/P] [/F] [/S] [/Q] [/A[:attributes]] names

ERASE [/P] [/F] [/S] [/Q] [/A[:attributes]] names

names Specifies a list of one or more files or directories.

Wildcards may be used to delete multiple files. If a directory is specified, all files within the directory will be deleted.

/P Prompts for confirmation before deleting each file.

/F Force deleting of read-only files.

/S Delete specified files from all subdirectories.

/Q Quiet mode, do not ask if ok to delete on global wildcard

/A Selects files to delete based on attributes

attributes R Read-only files S System files

H Hidden files A Files ready for archiving

I Not content indexed Files L Reparse Points

- Prefix meaning not

TO REMOVE A DIRECTORY/FOLDER

USE THE RD COMMAND TO REMOVE A DIRECTORY/FOLDER as shown below

D:\MYFOLDER>DEL *.*

COMPUTER FUNDAMENTALS

D:\MYFOLDER>CD .. (TO STEP BACK A FOLDER)

D:\>RD MYFOLDER

RENAME COMMAND

TO RENAME A FILE

D:\MYFOLDER:> REN SS.TXT ST.TXT

THIS COMMAND RENAMES THE SS.TXT TO ST.TXT

COPY COMMAND

To copy a file from source to destination

copy d:\source_folder\source_file.txt e:\dest_folder\dest_file.txt

here d:\ is the source drive

source_folder the source folder

source_file..txt is source file to be copied

here e:\ is the destination drive

destination_folder the destination folder

destination_file..txt is destination file to be copied

MOVE COMMAND

To Move a file from source to destination

move d:\source_folder\source_file.txt e:\dest_folder\dest_file.txt

here d:\ is the source drive

source_folder the source folder

source_file..txt is source file to be moved

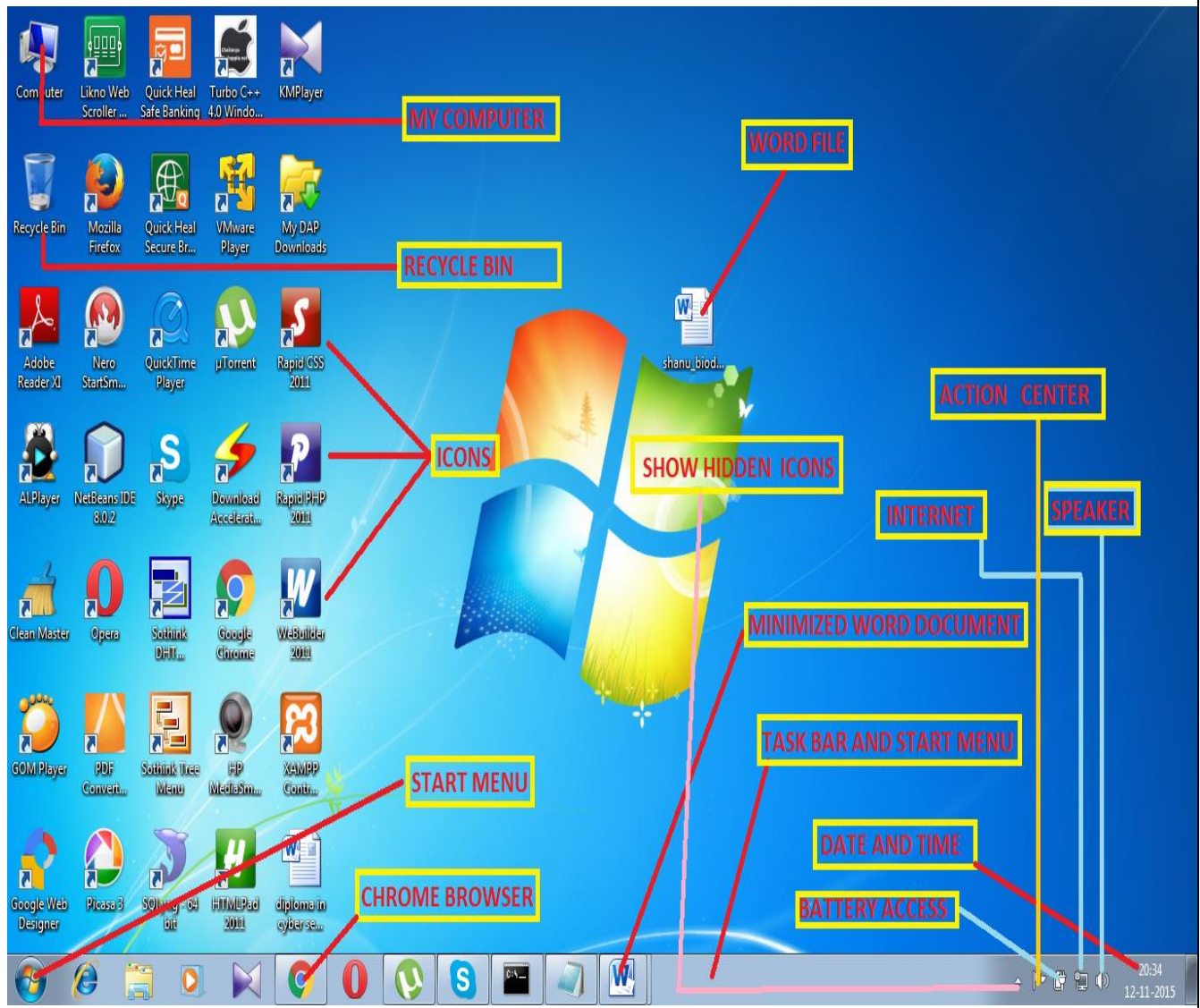
here e:\ is the destination drive

destination_folder the destination folder

destination_file..txt is destination file to be moved

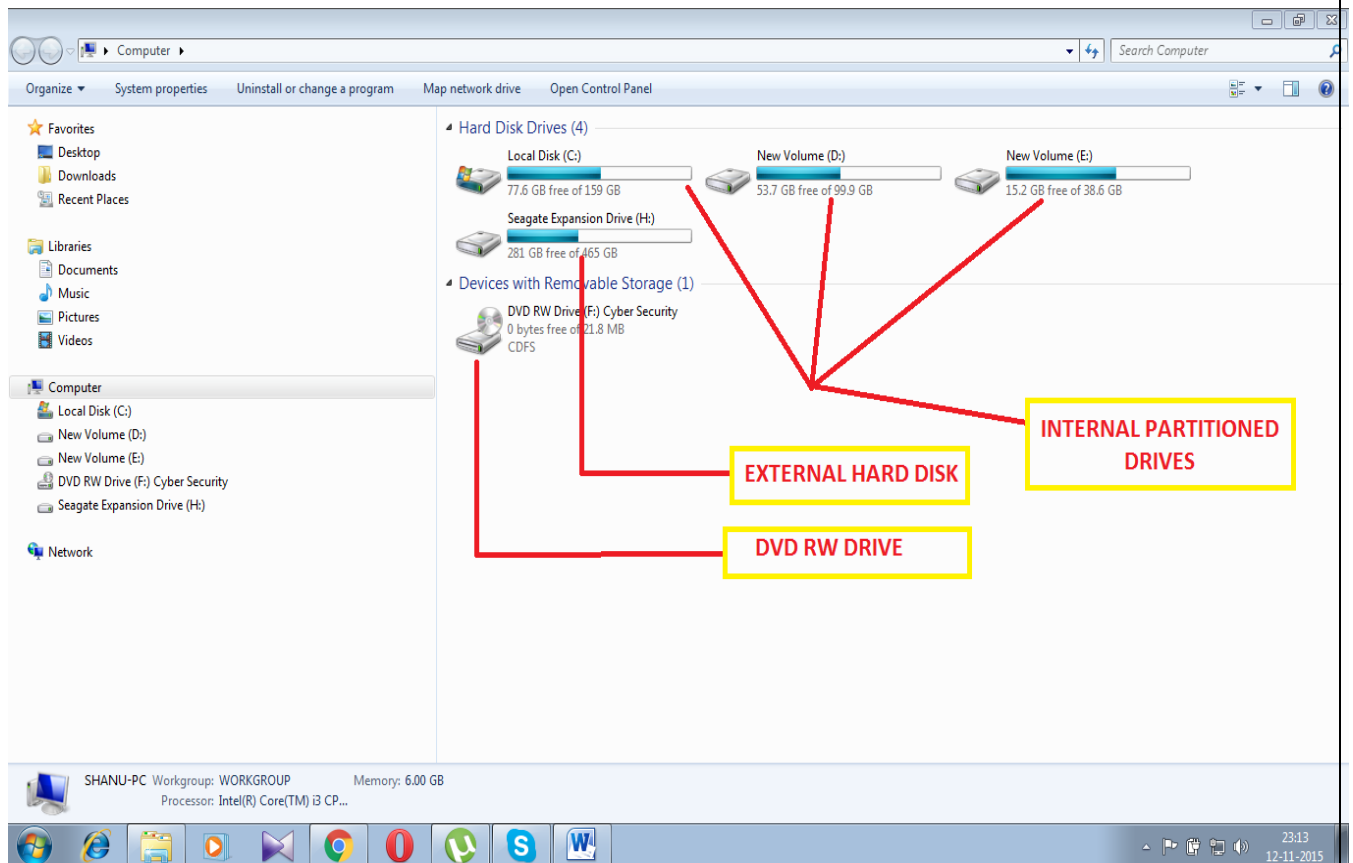
Windows -7

Windows -7 is a single user multiprocessing Operating System.



COMPUTER FUNDAMENTALS

My Computer:- My computer is used to open the drives



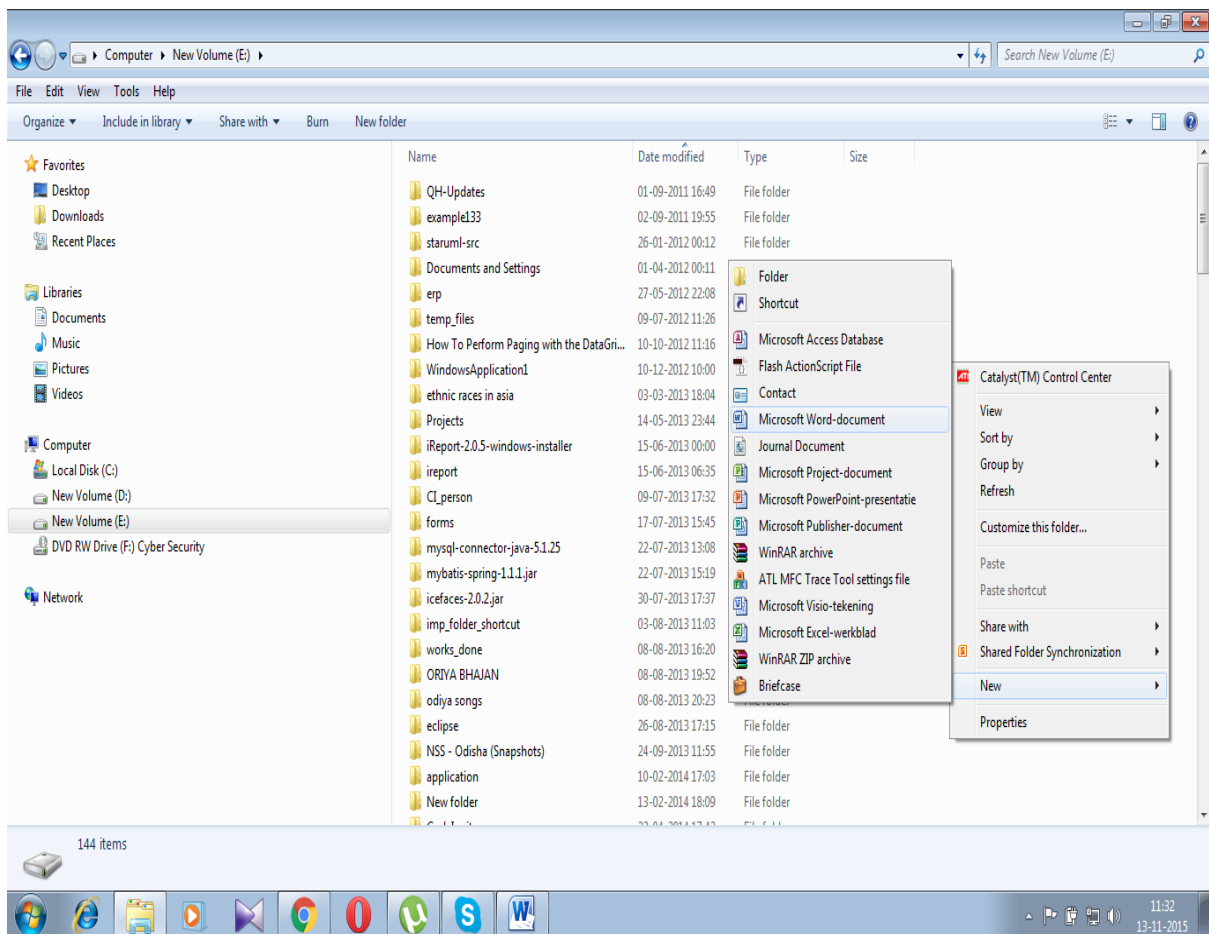
UNINSTALL/CHANGE A PROGRAM :- This is used to uninstall program

COMPUTER FUNDAMENTALS

HOW TO CREATE A FILE IN WINDOWS-7 UNDER A DRIVE

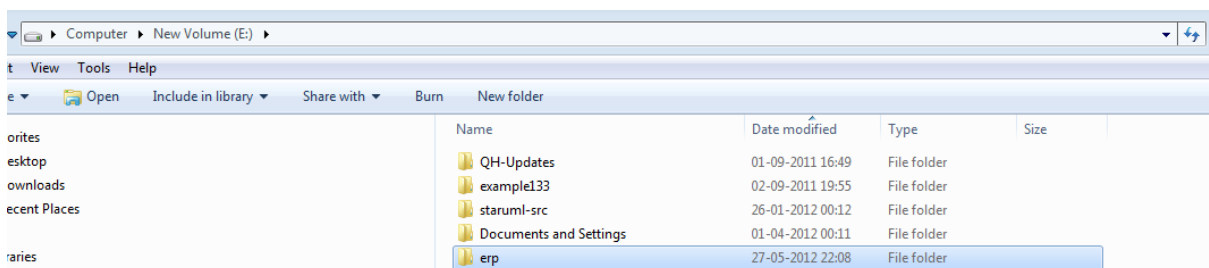
Double click the drive labelled C:/D:/E:

NOW RIGHT CLICK ON THE DRIVE TO GET THE MENU AS DEFINED BELOW

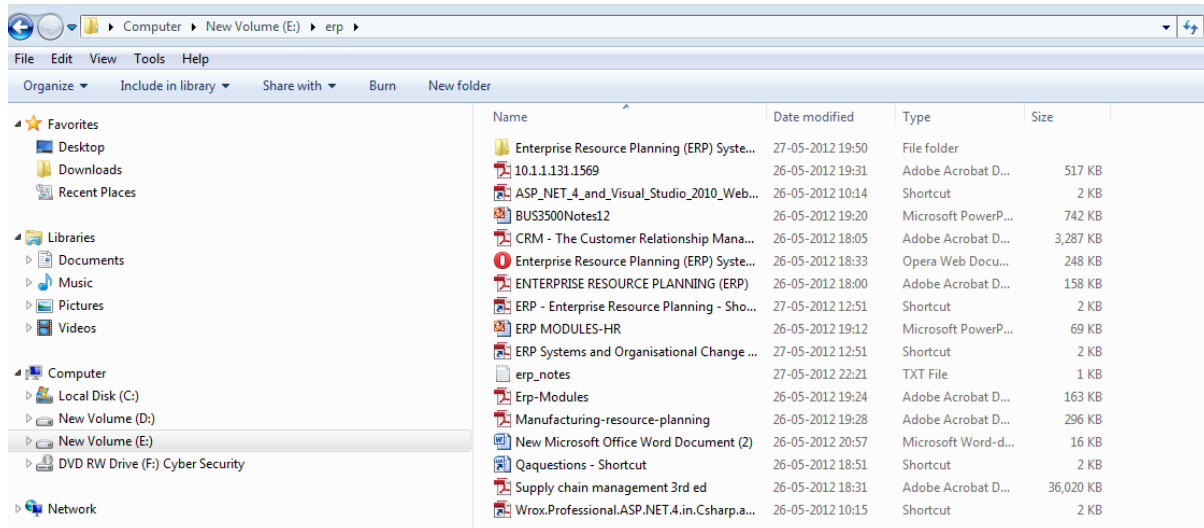


HOW TO VIEW THE CONTENTS OF A FOLDER

Double click the folder and you can see the contents of the folder as shown below.

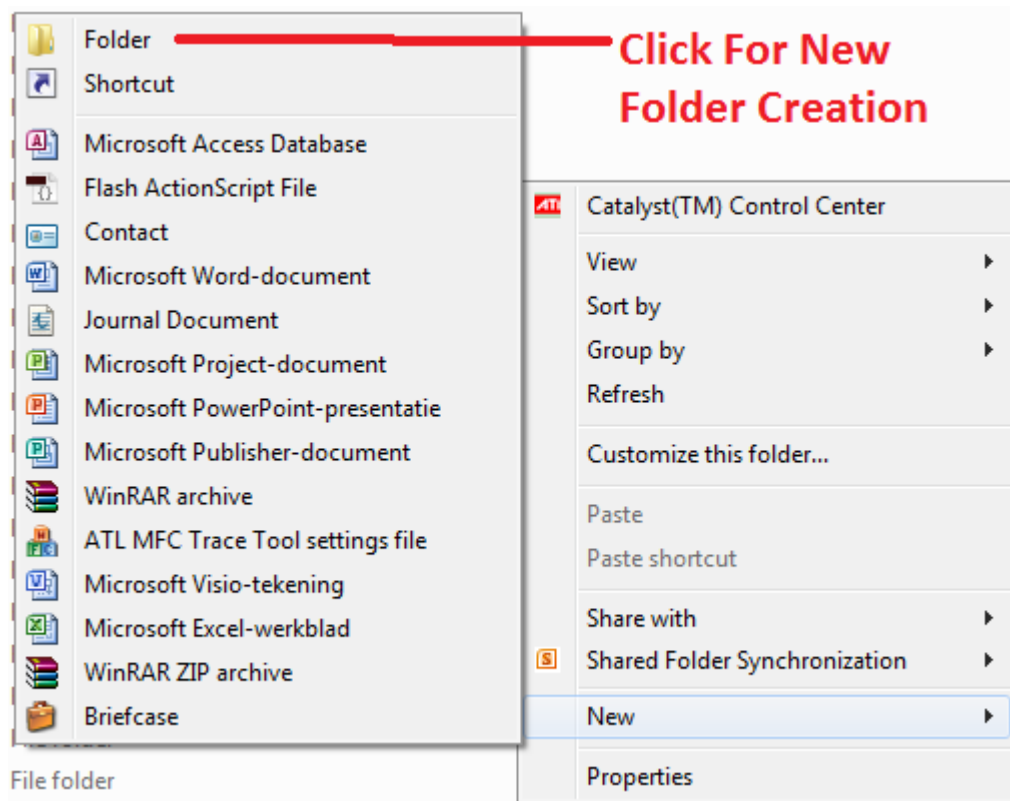


COMPUTER FUNDAMENTALS



HOW TO CREATE A FOLDER UNDER A DRIVE

Right click on the drive and you get the option as shown below.

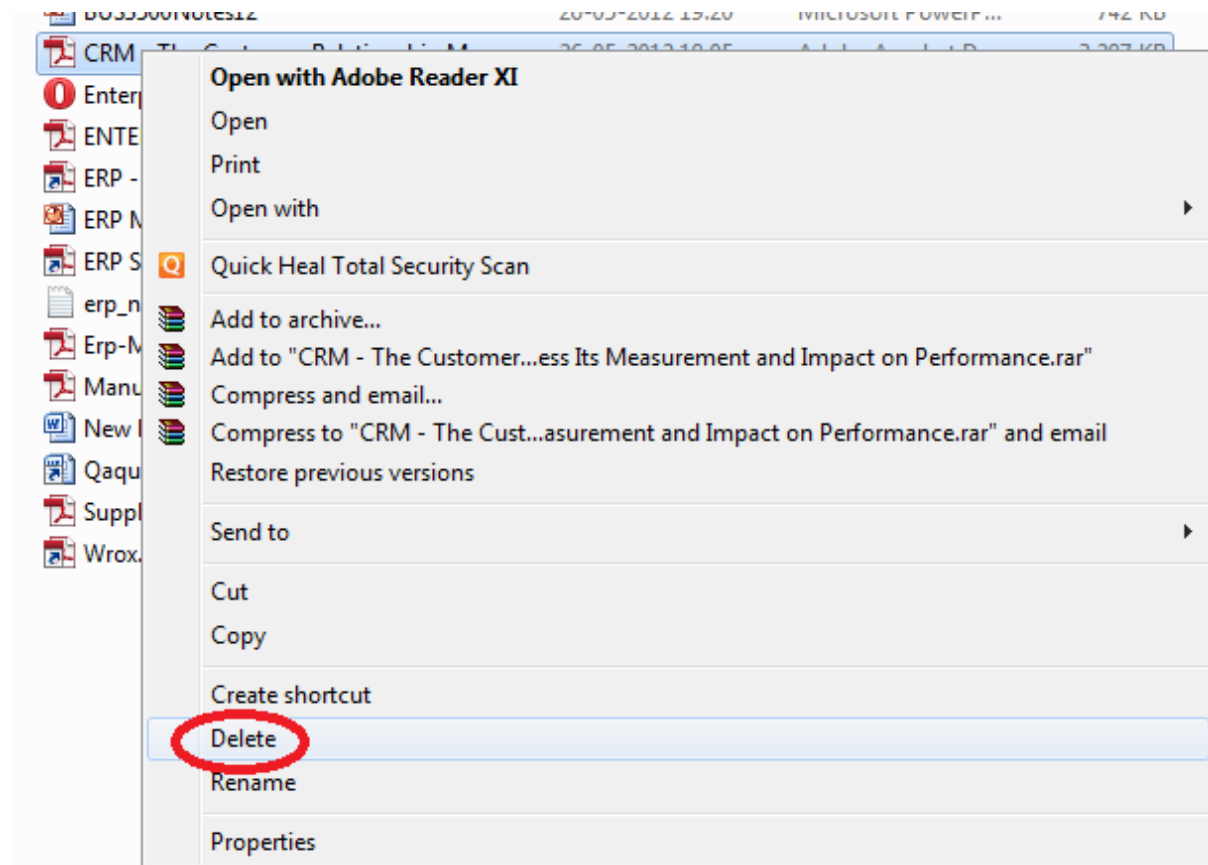


Follow the earlier steps to create a file under a folder

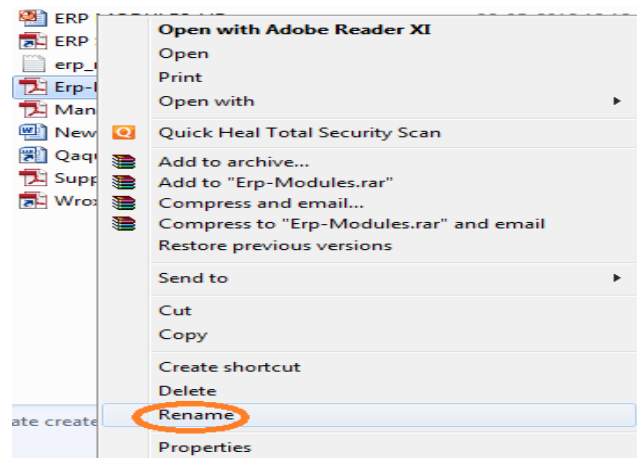
TO DELETE A FILE IN A FOLDER

Double Click The Folder

Right click the file and choose the option Delete



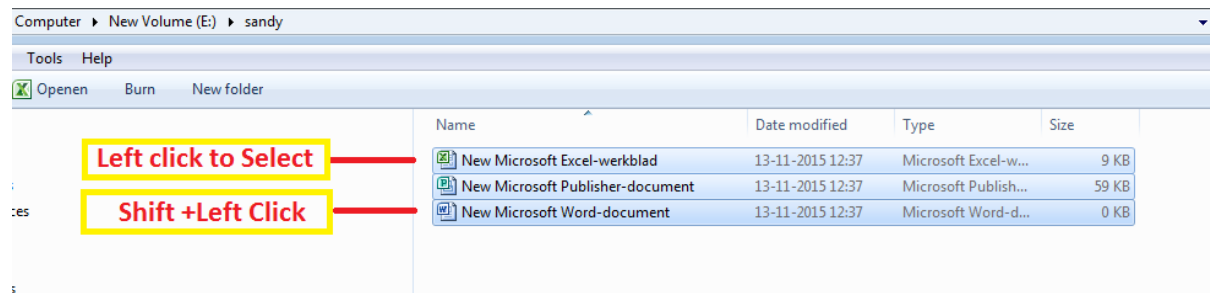
To Rename A File In The Folder



COMPUTER FUNDAMENTALS

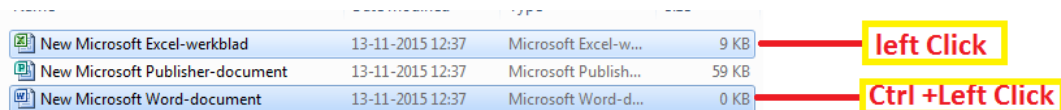
To Delete /Rename a folder right click on the folder and follow the same steps as that you did on a file.

Deleting All Files From A Folder:-Let us consider a folder say sandy



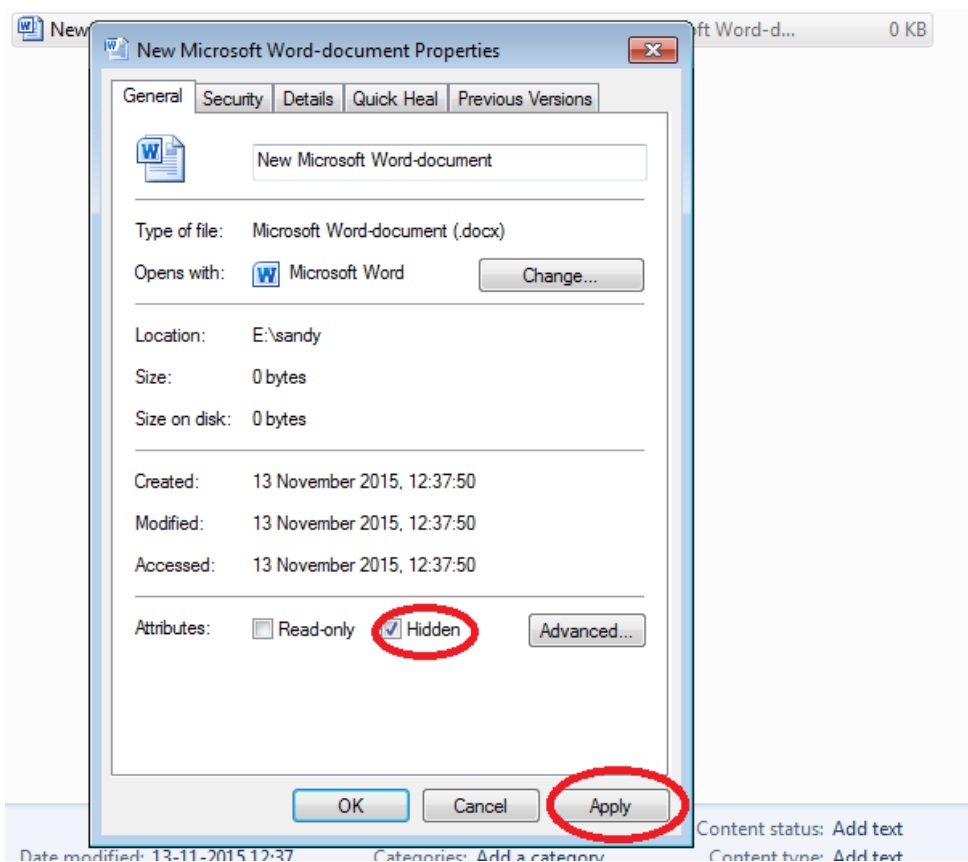
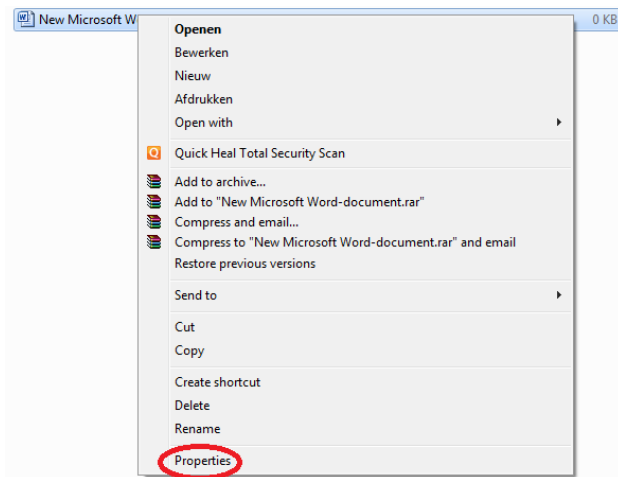
1. Left Click the first file
2. Shift and left click the last file in the folder
3. Press del key to delete files. These files go to the recycle bin
4. Press shift + del key to permanently delete files.

Deleting Specific Files From A folder :- Let us consider the folder say sandy



Press the del key to delete the selected files.

To hide a file :- Right Click on the file and you get the menu

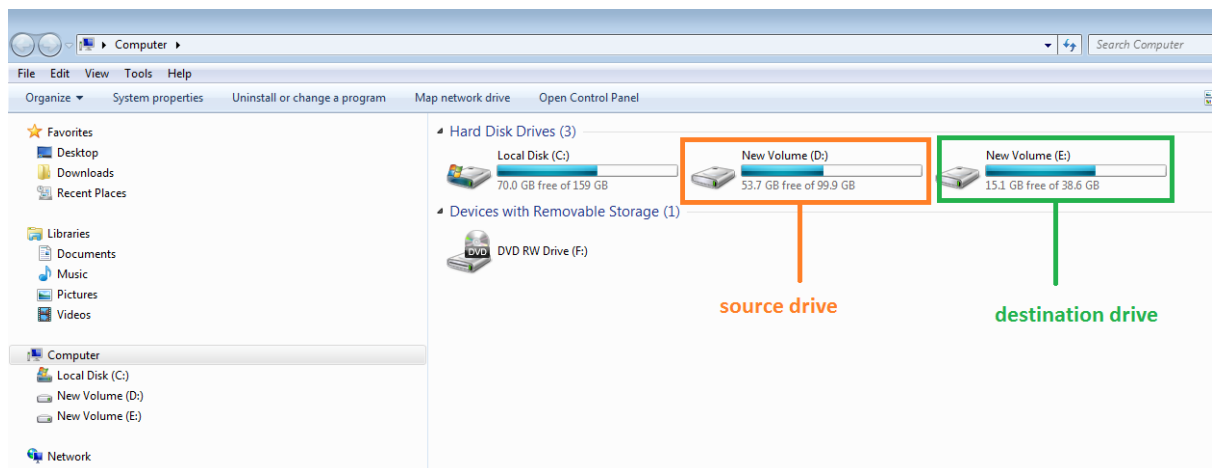


COMPUTER FUNDAMENTALS

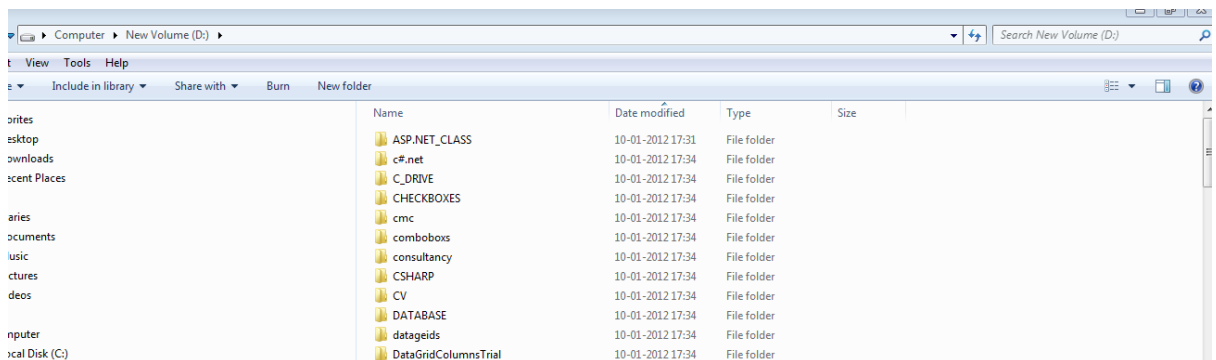
To Copy A File from A Folder To Another Folder

To copy a file from one folder to the Other Follow The Following Steps

1. Double Click on My Computer



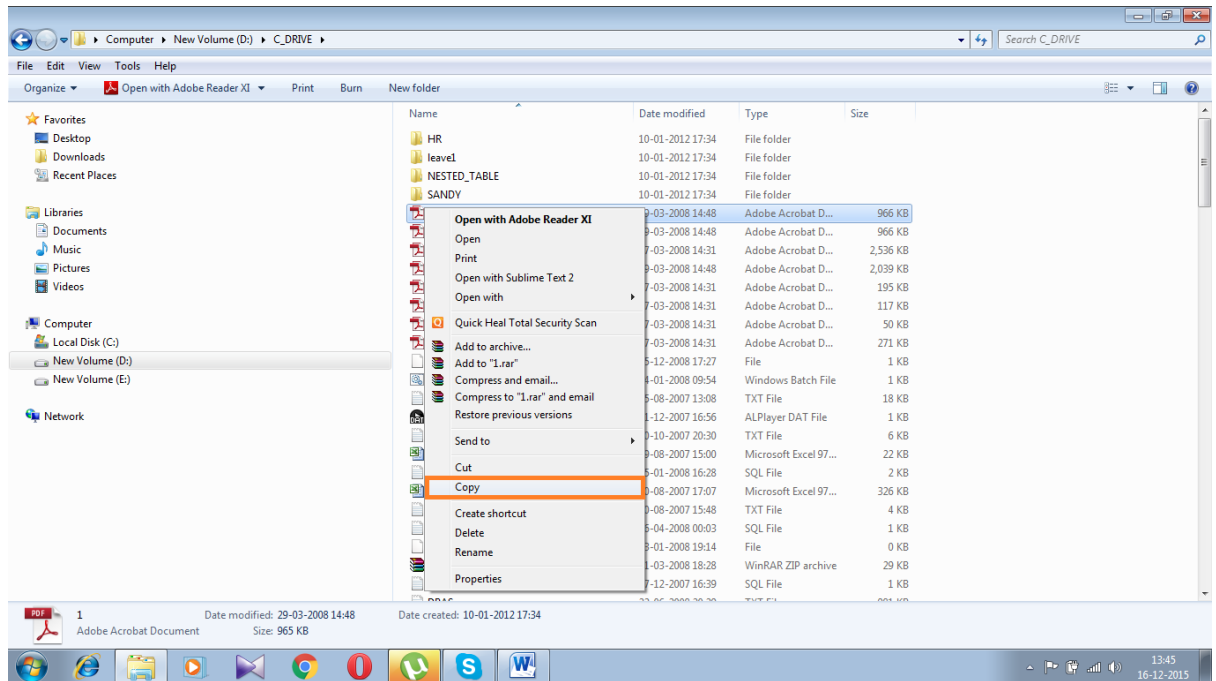
2. Open the source drive



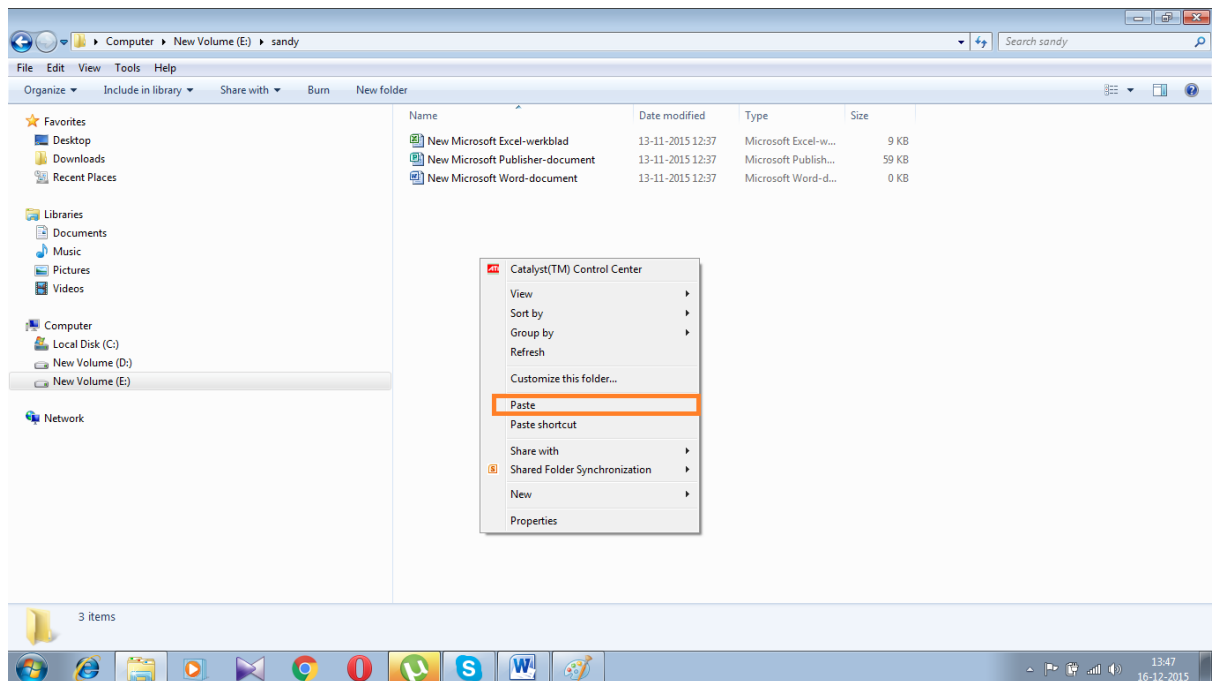
3. Open the source folder

4. Right click on the desired file to be copied

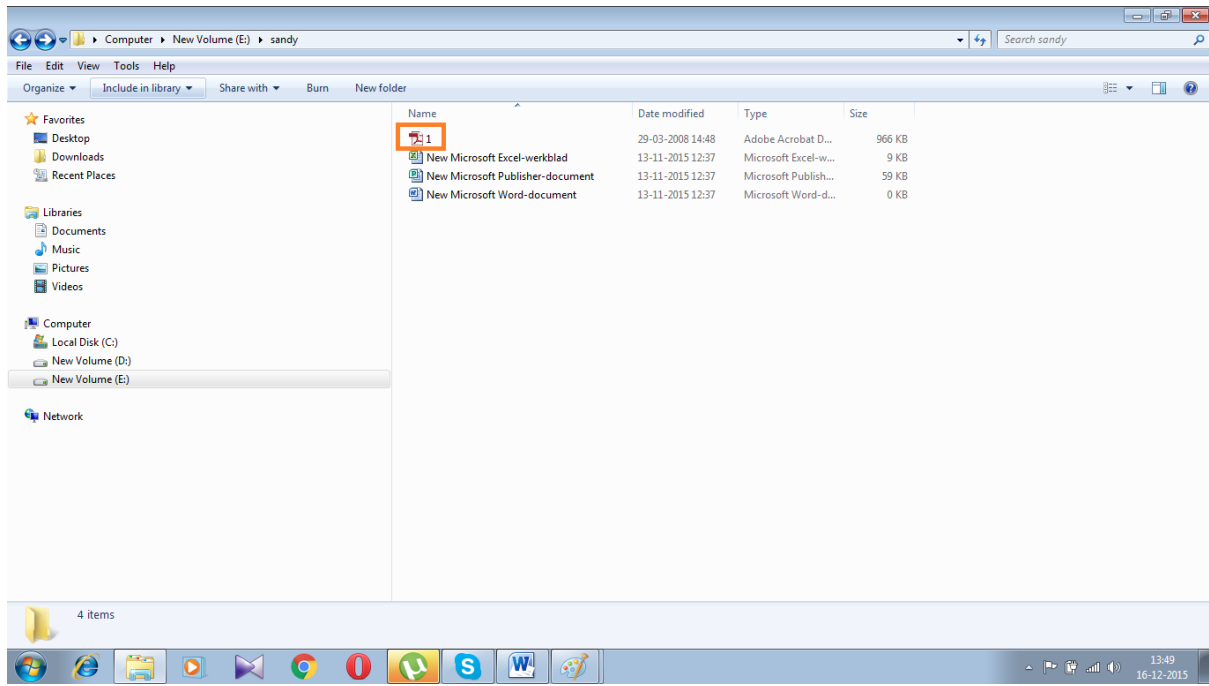
COMPUTER FUNDAMENTALS



5. Open the Destination drive
6. Open the Destination folder
7. Right click and paste



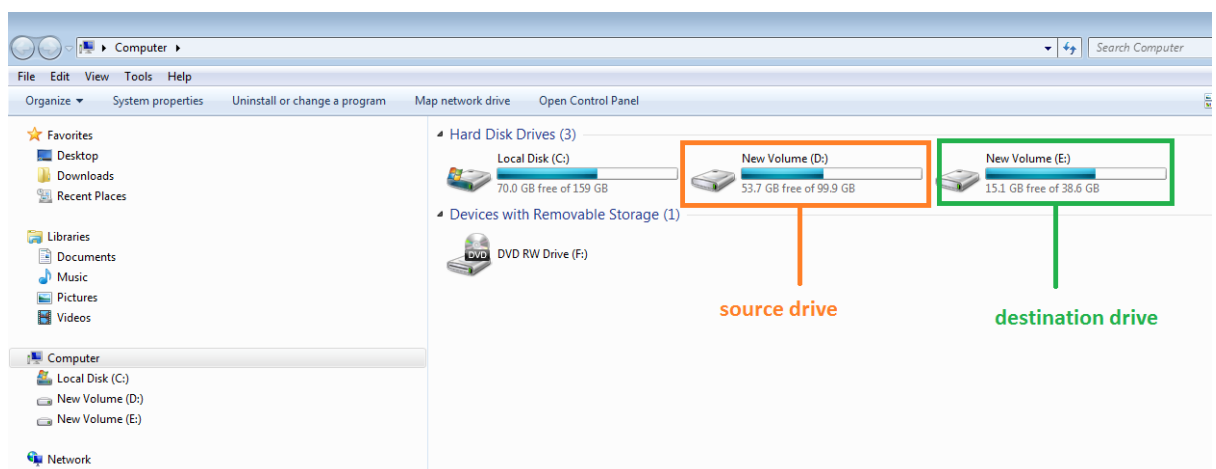
COMPUTER FUNDAMENTALS



To Cut A File from A Folder To Another Folder

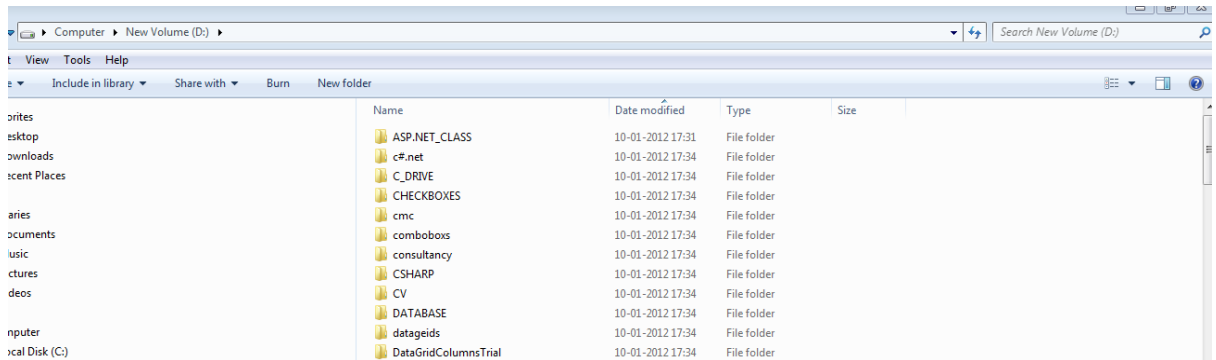
To cut a file from one folder and paste it to the Other Follow The Following Steps

1. Double Click on My Computer

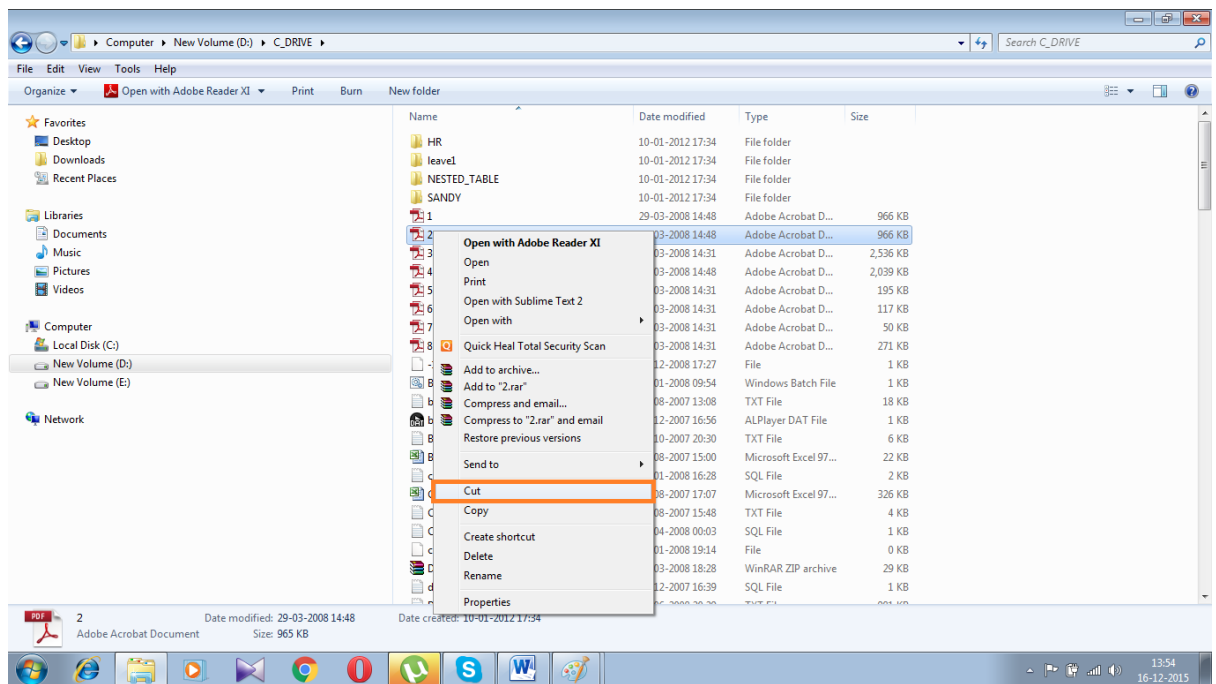


2. Open the source drive

COMPUTER FUNDAMENTALS

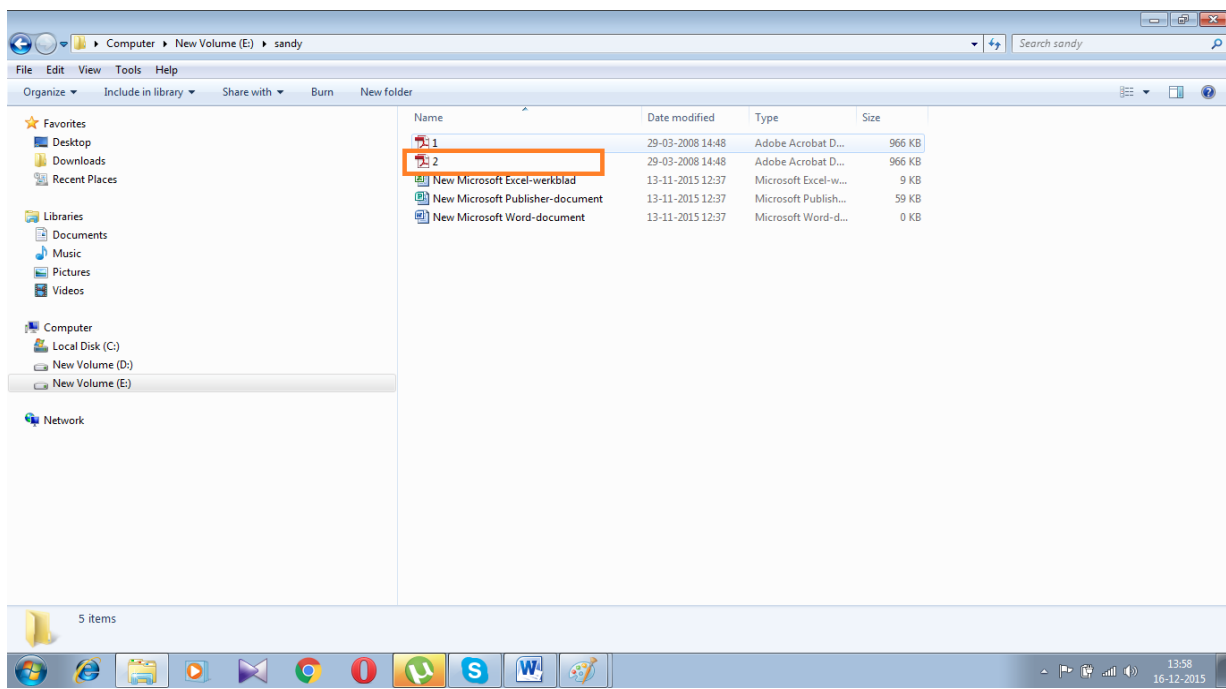
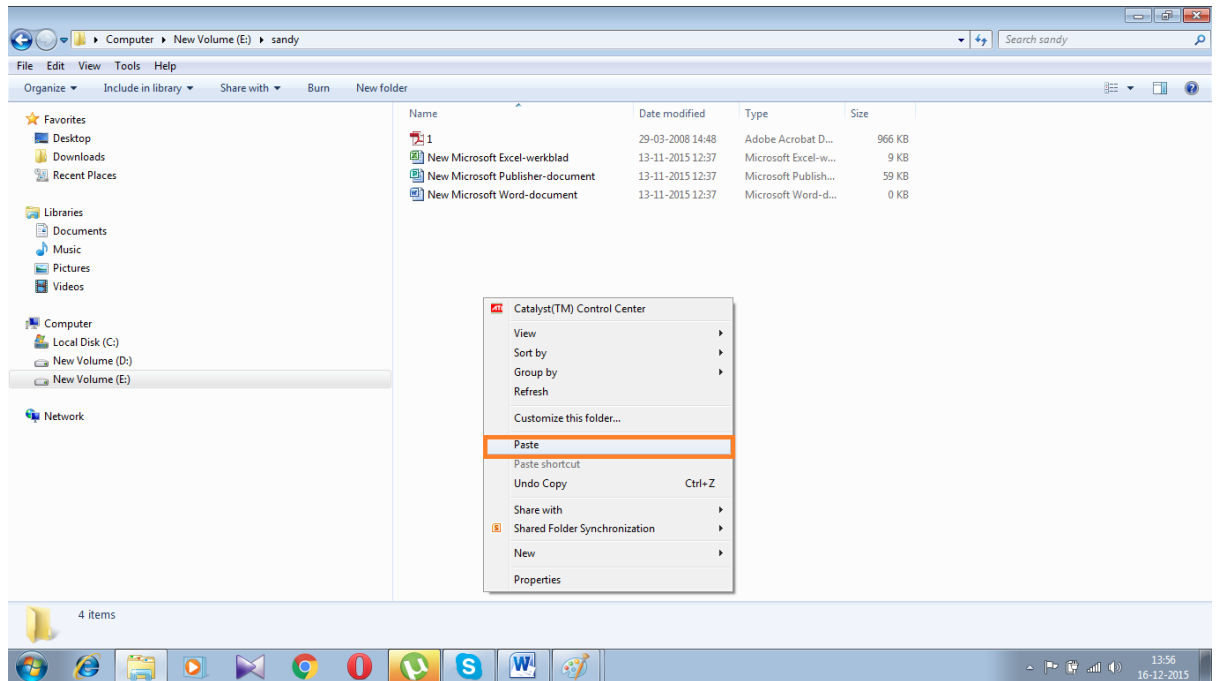


3. Open the source folder
4. Right click on the desired file to be copied



5. Open the Destination drive
6. Open the Destination folder
7. Right click and paste

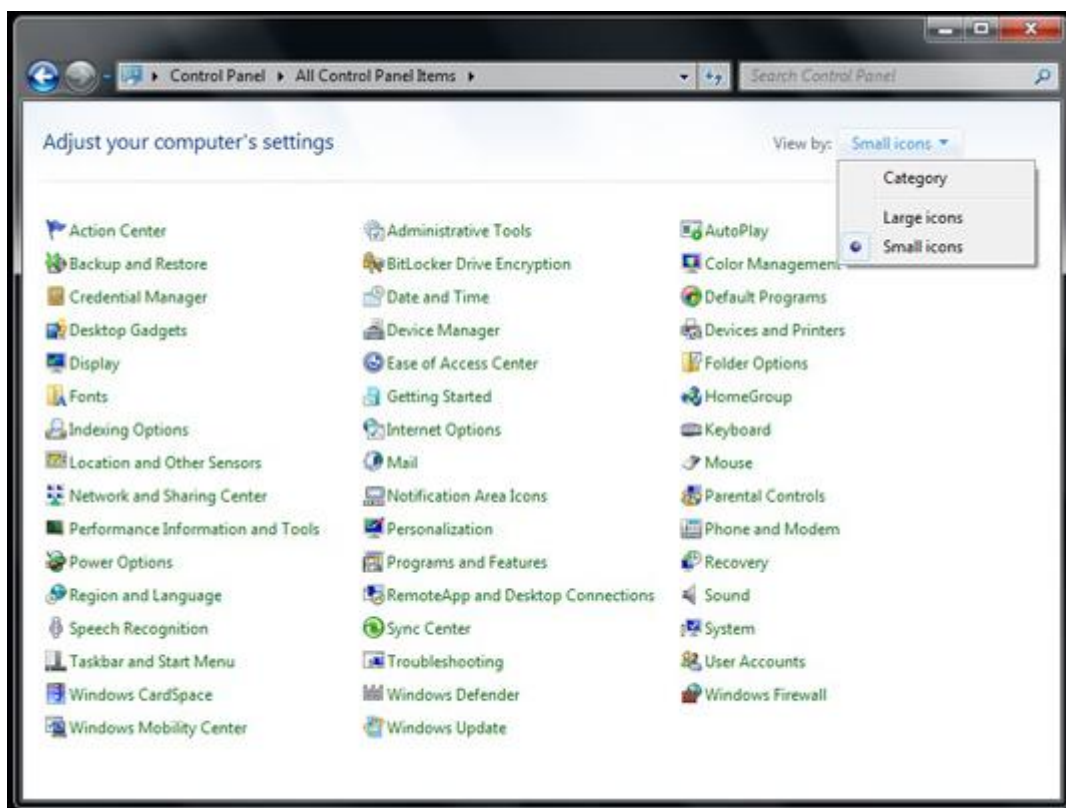
COMPUTER FUNDAMENTALS



Windows 7 Control Panel Features

The Control Panel in Windows 7 is the place to go when you need to make changes to various settings of your computer system. You can control most Windows commands and features using the various options and sliders in the Control Panel.

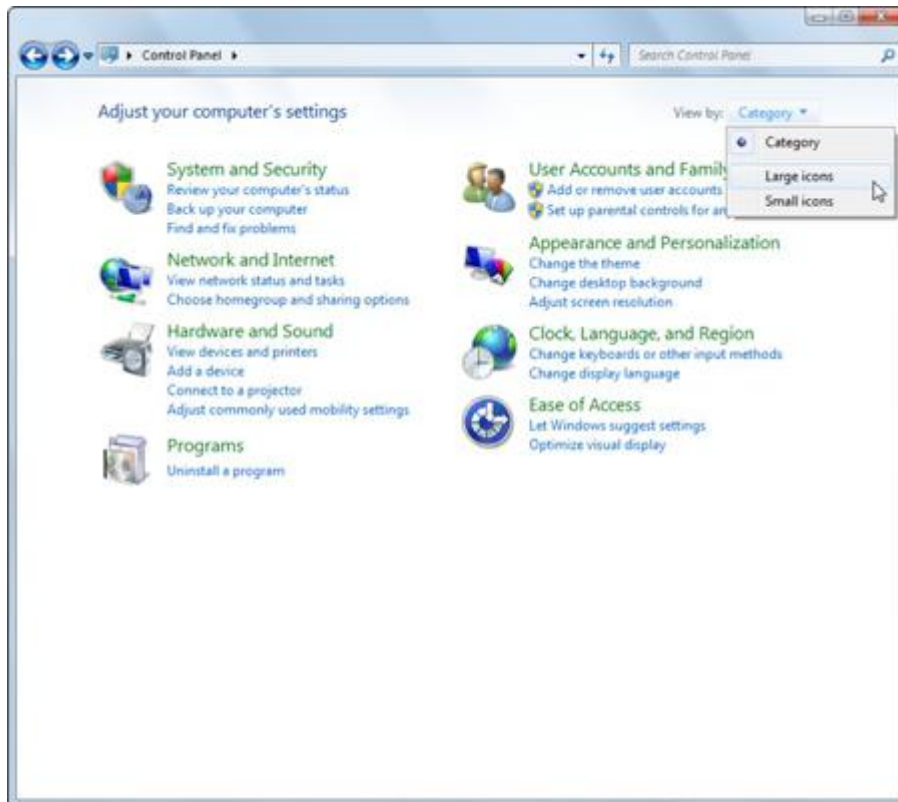
To open the Control Panel, click the Start button on the taskbar and then click Control Panel on the Start menu. Windows 7 gives you three different views for looking at your computer's Control Panel: To switch views, click the View By drop-down button (labeled Category by default) in the upper-right corner of the Control Panel and then choose one of the views from the button's drop-down menu.



Category view

By default, the Control Panel is displayed in Category view, which is separated into eight categories, ranging from System and Security to Ease of Access. To open a window with the Control Panel options for any one of these categories, simply click the category's hyperlink.

COMPUTER FUNDAMENTALS



The following table gives you a description of all the Control Panel categories, including the various programs you can find by clicking each category's hyperlink.

Click This Category Link . . .

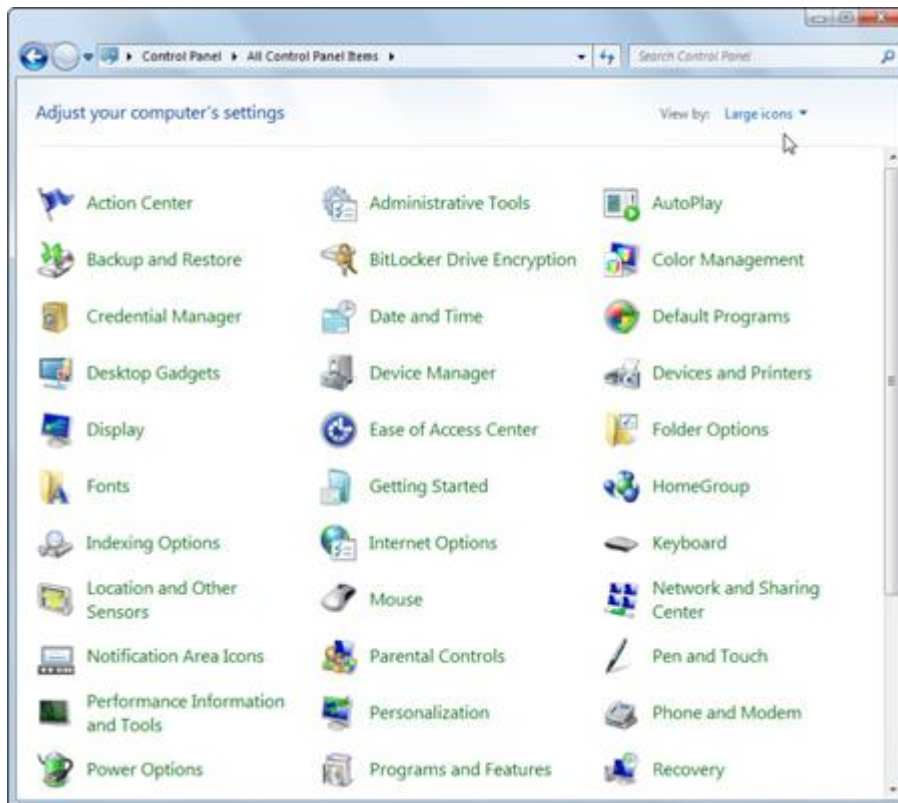
. . . To Display These Groups of Links

System and Security	Action Center, Windows Firewall, System, Windows Update, Power Options, Backup and Restore, BitLocker Drive Encryption, and Administrative Tools
User Accounts	User Accounts, Windows Cardspace, Credential Manager, and Mail (32-bit)
Network and Internet	Network and Sharing Center, Homegroup, and Internet Options
Appearance and Personalization	Personalization, Display, Desktop Gadgets, Taskbar and Start Menu, Ease of Access Center, Folder Options, and Fonts
Hardware and Sound	Devices and Printers, AutoPlay, Sound, Power Options, Display, and Windows Mobility Center
Clock, Language, and Region	Date and Time, and Region and Language
Programs	Programs and Features, Default Programs, and Desktop Gadgets
Ease of Access	Ease of Access Center and Speech Recognition

You'll notice that some Control Panel windows and dialog boxes can be accessed in more than one way. You can also find most Control Panel programs by doing a Start Menu search.

Icon views

The Control Panel's other two views are Large Icons view and Small Icons view. When the Control Panel is in one of the icon views, Windows displays an alphabetical listing of the more than 50 Control Panel programs on your system, ranging from Action Center to Windows Update. To view (and possibly change) the settings for a particular Control Panel option in one of the icon view modes, you need to double-click the Control Panel program icon.



Format using windows-7

1. Place the win 7 dvd in the dvd drive
2. Select boot from cd
3. Remove partitions if required and create new partitions
4. Select the partion where the win 7 will be installed and press enter
5. Wait till installation
6. After installation install all drivers for the system

QUESTIONS

1. What is a computer ?
2. What are the functions of the computer?
3. Write the generations of the computer?
4. What are the types of computer?
5. What are computer memory units?
6. Describe the number system?
7. From 1 to 10 convert to binary, octal, hexadecimal
8. From -1 to -10 convert to binary, octal, hexadecimal
9. Add 100 +200 by converting to binary
10. Subtract 100 from 200 by converting to binary.
11. Divide 5/2.5 binary
12. Find 1's complement of 23
13. Subtract 20 from 6 using 1's complement
14. Subtract 20 from 5 using 2's complement
15. What are the components of a computer describe?
16. What do you mean by hardware?
17. What do you mean by software?
18. What is data?
19. What is intranet and specify its uses?
20. What is internet and specify its uses?
21. What does MS DOS Stand for?
22. Why do we use DIR command describe?
23. How do you prepare a folder/directory in MSDOS?
24. How do you change the directory in MSDOS?
25. How to delete a file?
26. How to delete a directory?
27. How to change a directory?
28. What is windows?
29. How to create a folder in windows?
30. How to create a file in windows?
31. How to delete a file in windows?

COMPUTER FUNDAMENTALS

- 32. How to rename a file in windows7?
- 33. How to rename a directory in windows7.?