

11/3/24

OS

Experiment - 1

(a) PERIPHERALS OF A COMPUTER (INPUT / OUTPUT DEVICES)

A computer peripheral is any external device that provides input and output for the computer.

For example, a keyboard and mouse are input peripherals, while a monitor and printer are output peripherals.... some peripherals, such as external hard drives, provide both input and output for the computer.

INPUT DEVICES:

converts data to binary form acceptable by the computer.
sends data in binary form to the computer for further processing and accepts data from outside world.

some standard input devices are: keyboard, mouse, joystick and track ball scanner.

key board:

A keyboard is the most common input device. It is used to input data manually by typing. The computer keyboard is like a typewriter keyboard with some extra special keys called function keys and control keys which can be programmed by the user according to his needs.

mouse:

Mouse is basically a pointing device. This is also an input device but instead of sending characters it sends the coordinates of the point on the screen on which the associated cursor is placed.

joystick and tracker ball:

Both of these are again pointing devices and are used for the same purpose as mouse.

Scanner:

The scanner captures the entire information of an image directly from the source stores it in graphic format for displaying back on the screen.

Touch pads:

A device that lays on the desktop and responds to pressure.

Bar code readers:

Bar coded data is generally used in labelling goods, numbering the book etc. Bar coded reader scans a bar code image, converts it into an alphanumeric value.

optical Mark Reader (OMR)

OMR is a special type of optical scanner used to recognize the type of mark made by pen or pencil. It is used to where one out of a few alternatives is to be selected and marked.

OUTPUT DEVICES:

-Accepts data in
converts the coded data
some standard output
plotters.

video display unit:

A TV like screen
also called as raster

printers:

types of printers

character printer:

prints one character at a time

line printer:

prints one line at a time

page printer:

prints a page at a time

components of computer

Every computer has

1) CPU

2) Input unit

3) Output unit

central processing unit

The CPU

the CPU controls

the calculation

also an
send the
associated

are used

image
for display.

s to

ds,
code

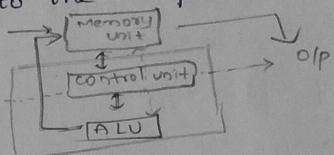
to
used

OUTPUT DEVICES:

-Accepts data in binary form from the computer.
converts the coded data to human acceptable form.
Some standard output devices: video display unit, printers,
plotters.

video display unit:

→ TV like screen connected to the computer. It is
also called as raster scan device.



Printers:

types of printers

character printer:

prints one character at a time.

Line printer:

prints one line of text at a time

Page printer:

prints a complete page at a time.

components of CPU and its functions

Every computer has 3 major components. They are

- 1) CPU
- 2) Input unit
- 3) Output unit

central processing unit (CPU)

The CPU is also called as brain of the computer.

The CPU controls the execution of programs and performs the calculations. It stores data, results and program.

CPU consists of following parts

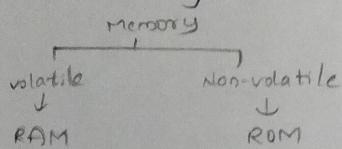
- i) Memory unit
- ii) Arithmetic logic unit
- iii) Control unit

i) Memory unit:

Memory is an essential element of a computer. Without its memory, a computer is of hardly any use. Memory plays an important role in saving and retrieving data.

Memory of 2 types

- i) Primary
- ii) Secondary



i) Primary memory or volatile memory:

Primary memory is internal memory of the computer. RAM and ROM both form primary memory. The primary memory provides main working space.

RAM:

Random Access Memory is the internal memory of CPU for storing data, program and program result. It is read/write memory. Data is stored in it and is lost when we switch off the computer or if there is a power failure. Hence a back up uninterruptible power system (UPS) is often used.

ROM:

Read only memory - ROM. The memory from where we can only read but cannot write. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture.

ii) Secondary memory or storage devices:
Secondary memory is the external memory of the computer. Secondary memory is cheaper than primary memory. Secondary memory can be in the form of floppy disks, magnetic disks, etc.

iii) Arithmetic logic unit:
The ALU is responsible for arithmetic operations like addition, subtraction, multiplication, division, etc. Logical operations are also performed by the ALU.

iii) Control unit:

It controls all other units. It instructs the input unit to receive data, receiving it from the output unit. It also receives instructions from the user.

Disassembling and Reassembling:

Before going to disassemble a computer, let us discuss few components.

1. Cabinet:

It is the skin of the computer. It protects the precious components.

2. Mother board:

The mother board is a thin plate which holds the central processing unit, the hard drive and the video card. It also has various ports for connecting peripheral devices.

i) Secondary memory or Non-volatile memory:

Secondary memory is external and permanent in nature.

The secondary memory is concerned with magnetic memory.

Secondary memory can be stored on storage media like floppy disks, magnetic disks, magnetic tapes.

ii) Arithmetic logic unit:

The ALU is responsible for performing all logical and arithmetic operations. Some of arithmetic operations are addition, subtraction, multiplication and division. Some of logical operations are comparison between numbers, letter etc.

iii) Control unit:

It controls all other units in the computer. The control unit instructs the input unit, where to store the data after receiving it from the user. It controls the flow of data and instructions from the storage unit to ALU.

Disassembling and Assembling the PC

Before going to disassembling and assembling we have to discuss few components

(1) Cabinet:

It is the skin for every computer. It is used to protect precious components like mother board, processor etc.

(2) Mother board:

The mother board is the computer's main circuit board. It's a thin plate that holds the CPU, memory, connectors for the hard drive and optical drives, expansion cards to control the video and audio and connections to your computer's ports.

(3) CPU / Processor:

The CPU also called a processor, is located inside the computer case on the motherboard. The CPU is generally a two-inch ceramic square with a silicon chip located inside. The processor's speed is measured in megahertz (MHz) or millions of instructions per second, and gigahertz (GHz) or billions of instructions per second.

(4) Power Supply Unit:

The power supply unit in a computer converts the power from the wall outlet to the type of power needed by the computer. It sends power through cables to the mother board and other components.

(5) RAM:

RAM is your system's short-term memory. Whenever your computer performs calculations, it temporarily stores the data in the RAM until it is needed.

(6) HARD Drive:

The hard drive on your computer is always where the software is installed and it's also where your documents and other files are stored. The hard drive is long-term storage, which means the data is still saved even if you turn the computer off or unplug it.

You save a file; the data is copied back to the hard drive. The faster the hard drive is, the faster your computer can start up.

Steps for disassembling

- Step - 1: Unplugging
the first thing you plugged into your comp
- 1) Power
- 2) USB
- 3) Mouse
- 4) Key board
- 5) Internet
- 6) Ethernet
- 7) Modem

Step - 2 Outshelf / ca

First off, unplug the computer. On most computers, there are knobs that you can turn on the back-right side of the computer.

Once the side panels are removed,

Step 3: Outer shell

Just flip the computer over. Also like the back of the computer.

Step - 4: System

Most computers have one blowing fan at the top and one blowing fan at the bottom. Remove the top cover.

ted inside the
is generally the
ip located inside
ahertz (MHz)
gigahertz (GHz)

erts the power
eeded by the
e mother

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ere the
uments
ng-term-
n if you.

the
your

steps for disassembling:

step - 1: unplugging

the first thing you do is unplug every cable that's
plugged into your computer. That includes:

- 1) power
- 2) USB
- 3) mouse
- 4) key board
- 5) Internet
- 6) Ethernet
- 7) Modem

Step - 2 outer shell / casing:

First off, unscrew the four screws on the back of
the computer. On most computer cases, there will be large
knobs that you can unscrew by hand or by screw driver
on the back-right side of the computer.

Once the screws are removed, you can remove the
side panels. On most computers, they just slide off.

Step 3: outer shell / casing (cont.):

Just like the side panels, the top panel slides
off. Also like the side panels, the top one slides toward
the back of the computer.

Step - 4: System Fan:

Most computers have two fans: the system fan, the
one blowing air into the computer, and the CPU fan, the
one blowing air onto the CPU heat sink. I will start by
removing the system fan first. It should be labelled

"SYS-FAN!"

Step 5: CPU Fan

The CPU fan is located right onto top of the heat sink, which is a large piece of metal with fins on the top. The CPU fan plugs into the mother board in a moment; that is hard to access. But just follow the wires and you should easily find it.

Step 6: power Supply (SMPS)

The power supply is the large metal box located on the upper-back part of the computer. The main power cord goes into the back of the power supply.

The power supply supplies power to every component in a computer, therefore it has the most wires out of every other component in the computer. The first thing I will do is unplug every wire coming from the power supply. The list below is everything that I had to disconnect:

Mother board

CD/DVD drive(s) power

Internal hard drive power

Portable hard drives

Once everything is unplugged, unscrew the four screws holding the power supply in place, on the back of the computer.

Step 7: CD/DVD drive

The CD/DVD drive is one of the easiest components to remove. First, unplug the ribbon from the back of the drive. Once that is completed, pull on the tab securing the drive

in place, then push it out

Step 8: Hard disk

First off, de-attach the slot and unplug the wires. Also unplug the SATA cable from the hard drive.

To remove the hard drive, unscrew the four screws.

Step 9: Expansion card

Expansion cards installed.

Different examples a

Network card

Sound card

Video card

There should

expansion card

Step 10: connecting

The connection

and back of the

like USB, microphone

Step 11: RAM

So pretty your computer and two RAM

in place, then push it out from the inside

Step 8: Hard disk

First off, de-attach the connector at the back of the slot and unplug the other end from the mother board. Also unplug the SATA cable from the mother board and hard drive.

To remove the hard drive from the side of the slot, unscrew the four screws securing it in place.

Step 9: Expansion cards

Expansion cards give computer new capabilities, once installed.

Different examples are:

Network card

Sound card

Video card

There should be a single screw on top of each expansion card slot, whether it's occupied or empty.

Step 10: Connectivity center cables (front and back panel)

The connectivity center is the area on the front and back of the computer where there is many input sections like USB, microphone, headphones etc.

Step 11: RAM

So pretty much, the more RAM you have, the faster your computer runs. Most computers have 4 RAM slots, and two RAM chips. My computer came stock with two,

but yours might have more or less. To remove the RAM, push down on both tabs holding the RAM in place.

Step 12: power Button

there is a zip tie holding the wires / cables for the front connectivity center and front power button / LEDs circuit. To remove the chasis, press on the tabs that are located on the chasis's side. Refer pictures to see tabs. To remove the LEDs from the "chasis", push them from the front.

Step 13: Mother board:

The mother board links every component in the computer together. The CPU, RAM, and the expansion cards are attached directly to it.

The mother board has screw holding it to the frame, which are indicated by image with circles around them.

Step 14: Done!

case:

Metal Right Panel Metal

Left Panel Plastic Front

Panel plastic top panel

Metal & plastic Frame

Hardware

Hard drive CD/DVD

Drive power supply

Expansion cards RAM

chips
connectivity center

cables / wires:

SATA cable

Portable HDD Dock and

Miscellaneous:

33 screws

Drive slot cover

2 expansion card slo

Small CPU Fan.

Steps for assembly

Fix the SMPS on the

Fix the mother board

Screws provided.

Insert the pre-pro

the corner with n

pinholes

Fix the processor

connect power c

Insert the RF

Set the jumper

fix the hard

cabinet.

Fix HDD, CD

Connect HD

flat ribbon.

the RAM
in place.
cables for the
LEDs
that are
see tabs.
push them

on the
cards are

the flame,
em.

chips
connectivity center
cables/wires:
SATA cable
portable HDD Dock and wires
Miscellaneous:
33 screws
Drive slot cover
2 expansion card slot covers
Small CPU fan.

Steps for assembling

Fix the SMPS on the cabinet of pc using the screws provided.

Fix the mother board on the cabinet of pc using the
screws provided.

Insert the pre-processor into the slot provided such that
the corner with no pin coincide with coincide without
pinholes

Fix the processor fan on the processor.

Connect power cable to the processor fan

Insert the RAM card into the slots provided

Set the jumpers setting on disk drive.

Fix the hard disk drive in the space provided in PC
cabinet.

Fix HDD, CD-ROM in the space provided.

Connect HDD, CD-ROM drive to mother board using
flat ribbon.

connect power supply to the HDD, CD-ROM drives using
SMPS

place the cabinet in right position.

Fix the doors of the cabinet. connect the data cable of
monitor to the CPU. connect the keyboard cable to the

CPU

connect mouse cable to CPU

connect other devices to CPU

Connect the LAN cable to NIC in CPU

connect the power supply to CPU

connect power supply to monitor

Switch on the computer after giving power supply.

Q18

1b) Install MS Windows
Windows 10 is the
windows operating system
on July 15, 2015. two
a) Windows 10 Home
installation process.

Installation window

Begin the installation

Step-1:

Insert the Windows
computer

Step-2

choose the OS

input method

Step-3

You will get

Step-4

We have to

Step-5

Accept the license

Step-6

Next, you will

choose to do

Step-7

Now you

can format

using
cable of
use to the
ply.

1b) Install MS Windows on the personal computer

Windows 10 is the latest desktop version of the Microsoft windows operating system. It was made publicly available on July 15, 2015. Two editions of Windows 10 are available
a) Windows 10 Home edition b) Windows 10 Professional.

Installation process.

Installation Windows 10 can take up to 1 hour 30 minutes

Begin the installation

Step-1:

Insert the Windows 10 CD or pendrive and restart your computer

Step-2

choose the OS language, time and currency format and input method

Step-3

You will get a screen

Step-4

We have to enter the product key

Step-5

Accept the license terms. After you read them

Step-6

Next, you will be presented with a screen, where you can choose to do either an upgrade or a custom install.

Step-7

Now you select the drive to install Windows 10. You can format a drive here as well.

Step-8

Now you wait

Step-9
choose customize settings to customize them. Notice that little icon at bottom left. click on it to access an accessibility menu.

Step-10
If you choose to customize the settings, first page deals with your contact, calendar, input etc. Read these carefully to decide if you want to turn the settings on or off

Step-11
The next page deals with browser data
User Account creation & permissions
Admin
Multiple user
Thank you

1c) Install Linux on t
have windows install
as dual.

sa) Ubuntu(LINUX)

Ubuntu is a
for personal compu
servers. It uses un
gt is based on free
southern African p

Installation pro

1. Boot computer
or ISO
2. Welcome screen
3. Installation
Ubuntu 12.10
4. Select nearest
5. Keyboard
6. Fill information
7. Installation
8. Installation
9. Booting
10. Login screen

Experiment - 2

2a) Implement in c language the following Linux commands
1) cat 2) mv 3) ls

→ The echo command:

\$ x=100
kmit@kmit: ~ \$ "The value of x = \$x"
O/P: the value of x=100

→ The PATH command:

Syntax: \$ echo \$ PATH
O/P: home/kmit/bin: /home/kmit/.local/bin

→ The man command:

Syntax: \$ man passwd

O/P changing password for kmit

(current) UNIX password:

passwd: xxxxx

passwd: passwd changed

→ The printf command:

Syntax: \$ printf "%s" "Hello world"

O/P: Hello world

→ The script command:

Syntax: \$ script my-session-log

O/P: Script started, file is my-session-log.

→ The ls command

Syntax: \$ ls
karthik
JSP

O/P my-session.log

the cat command

Syntax: \$ cat my-session.log
Script started on 2022

O/P 15:20:10 +05:22

The touch command
touch grass

Syntax: ls

Pavani
JSP

O/P my-session
grass.txt

The mv command

Syntax: mv grass

ls

O/P karthik

The rm command

Syntax: rm

files

O/P pavani

The uname command

Syntax: \$ u

O/P Lin

m. Notice
to access

t page
d these
ings on

(c) Install Linux on the computer. This computer should have windows installed. The system should be configured as dual.

iii) Ubuntu(LINUX) installation

Ubuntu is a Debian-based Linux OS distribution for personal computers, Smart phones and network servers. It uses Unity as its default desktop environment. It is based on free software and named after the Southern African philosophy of Ubuntu.

Installation process:

1. Boot computer with Ubuntu 12.10 Installation CD/DVD or ISO
2. Welcome screen of Ubuntu 12.10
3. Installation type selection
Ubuntu 12.10 installation type
4. Select nearest city in your time zone
5. Keyboard selection
6. Fill information and continue
7. Installation is in progress.
8. Installation is completed, eject CD/DVD and restart
9. Booting your Ubuntu box
10. Login Screen
11. Ubuntu desktop
12. Ubuntu desktop with system settings
13. That's it, Ubuntu is now installed

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Linux commands

→ The ls command

Syntax \$ ls

Karthik
JSP

O/P my-session.log

The cat command

Syntax \$ cat my-session.log

Script started on 2024-04-08

o/p 15:20:10 +05:30

The touch command

touch grass.txt

Syntax ls

Pavani

JSP

O/P my-session.log
grass.txt

The mv command

Syntax mv grass.txt grass.txt

ls

O/P ~~Karthik JSP~~ my-session.log grass.txt

The rm command

Syntax rm my-session.log

ls

O/P pavani JSP grass.txt

The uname command

Syntax \$ uname

O/P Linux

the who command

2) Syntax \$ who
o/p kmit tky a 2024-04-08 14:51

the date command

Syntax \$ date
Mon Apr 8 15:23:42 IST 2024
% \$ date -d 'last friday'
Fri Apr 5 00:00:00 IST 2024

the cd command

Syntax \$ cd /name/kmit/Desktop

the pwd command

Syntax \$ pwd
o/p name/kmit/Documents

2b) write a C program
parent process to display "child" on the
program:

```
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>

int main()
{
    int pid, Pid1,
    pid=fork();
    if (pid == -1)
    {
        printf("E
exit(0);
    }
    if (pid != 0)
    {
        Pid1=ge
        printf(
    }
    else
    {
        pid2=
        prin
    }
}
```

}

O/p

The parent

2b) write a C program to create child process and also parent process to display "parent" and the child to display "child" on the screen.

program:

```
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>
int main()
{
    int pid, pid1, pid2;
    pid=fork();
    if (pid == -1)
    {
        printf("Error in process creation\n");
        exit(0);
    }
    if (pid != 0)
    {
        pid1=getpid();
        printf ("In the parent process ID is %d\n", pid1);
    }
    else
    {
        pid2=getpid();
        printf ("In the child process ID is %d\n", pid2);
    }
}
```

O/p

The parent process ID is 1602
The child process ID is 1602

(Pyaar
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Experiment - 3

3. Assume you have the following jobs to execute on one processor, with the jobs arriving in the order listed here.

i	$T(P_i)$
0	80
1	20
2	10
3	20
4	50

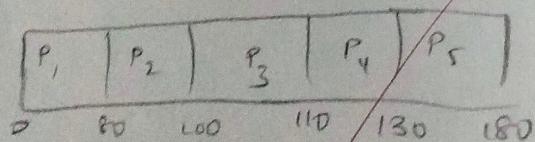
With the following values write a program to get the required output which is listed below.

a) Suppose a system uses FCFS scheduling. Create a Gantt chart illustrating the execution.

b) Avg TAT

c) Avg WT.

Gantt chart



Avg TAT

TAT = Completion time - Arrival time

$$TAT \text{ for } P_1 = 80 - 0 = 80$$

$$TAT \text{ for } P_2 = 100 - 0 = 100$$

$$TAT \text{ for } P_3 = 110 - 0 = 110$$

$$TAT \text{ for } P_4 = 130 - 0 = 130$$

$$TAT \text{ for } P_5 = 180 - 0 = 180$$

$$\text{Avg TAT} = (80 + 100 + 110 + 130 + 180) / 5 = 120$$

Avg WT:

$$\text{Waiting time} = TAT - Turnaround time$$

$$WT \text{ for } P_1 = 80 - 0 = 80$$

$$WT \text{ for } P_2 = 100 - 80 = 20$$

$$WT \text{ for } P_3 = 110 - 100 = 10$$

$$WT \text{ for } P_4 = 130 - 110 = 20$$

$$WT \text{ for } P_5 = 180 - 130 = 50$$

$$\text{Avg WT} = (0 + 80 + 20 + 10 + 20) / 5 = 84$$

execute with
the order

$$\begin{aligned} \text{TAT for } P_4 &= 130 - 0 = 130 \\ \text{TAT for } P_5 &= 180 - 0 = 180 \\ \text{Avg TAT} &= (80 + 100 + 110 + 130 + 180) / 5 \\ &= 120 \end{aligned}$$

Avg WT:

$$\text{Waiting time} = \text{TAT} - \text{Burst time}$$

$$WT \text{ for } P_1 = 80 - 80 = 0$$

$$WT \text{ for } P_2 = 100 - 20 = 80$$

$$WT \text{ for } P_3 = 110 - 10 = 100$$

$$WT \text{ for } P_4 = 130 - 20 = 110$$

$$WT \text{ for } P_5 = 180 - 50 = 130$$

$$\begin{aligned} \text{Avg WT} &= (0 + 80 + 100 + 110 + 130) / 5 \\ &= 84 \end{aligned}$$

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