(Stage 1) Requirements Analysis

This is the first stage, and involves a group of people called *systems analysts* analysing the requirements of the software and figuring out what functions are needed to help solve the problem. The analysts produce a feasibility report that defines the requirements of the new system and recommends whether or not they can be met. Alternatives may also be suggested such as a reduced system to match the costs and needs of the project.

(Stage 2) System and Software Design

This stage involves **designers** working out how the software should look and behave. The design addresses the functions required and the operation of the software to fit the particular problem it's designed to solve.

There are two parts to the design stage. The first part addresses the hardware systems required (computers, network, input and output devices etc). This process is known as **systems design**. The second part of the design stage concerns the identification of software requirements and the design of software components. This stage is known as the **software design** process.

(Stage 3) Implementation and Testing

Once the software has been designed, the **programmers** write various functions and routines that make the software and commands function. Each module of the system is built according the outline design until the entire system is complete.

(Stage 4) System Testing

At the final stage, it has to be tested and have any mistakes fixed. Only then is the software released.

(Stage 5) Operation and Maintenance

This is usually the longest stage of the lifecycle. The newly developed system is installed and put into use. Data from the old system may be converted to use in the new system. Feedback is obtained from users to locate problems and identify further improvements. Additional system maintenance is undertaken as an on-going process.

- **Beta Versions.**

Sometimes software is released to the public before it has been fully tested. These pre-release versions of the software are known as **Beta Versions**.
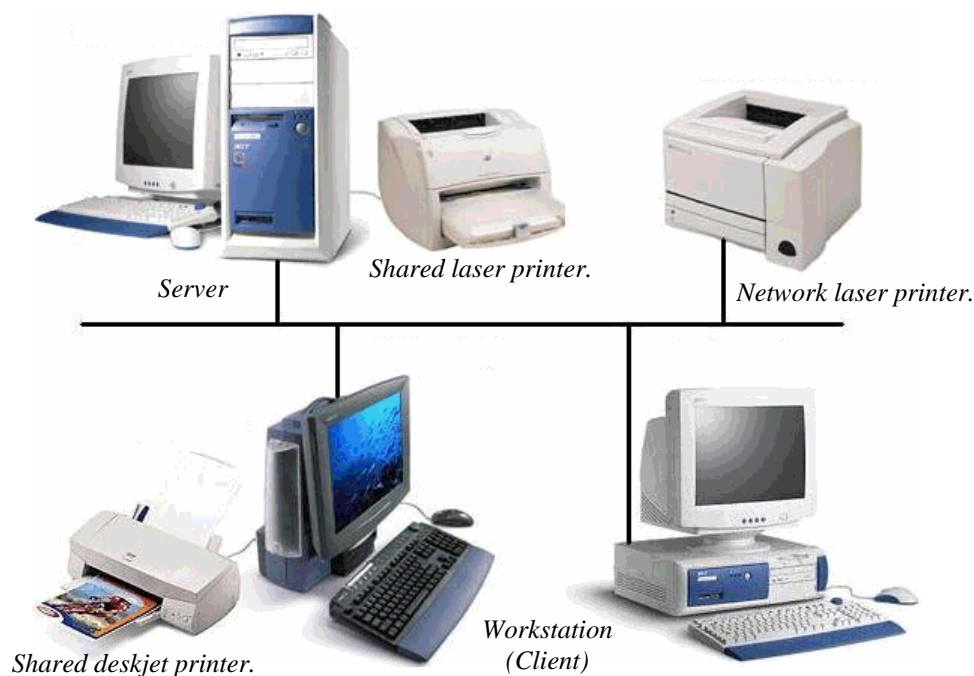
- **Software Bugs.**

Software programs are often so large and complex, most of the time the people testing them can't find all the errors and problems. After a program has been out for a while, users notice that there are little things wrong with the software here and there - these things are called *bugs*. When the number of bugs found in software increase, a *patch*, or *service pack* is often released. This is a little add-on program that fixes most of the bugs that people have found.

4.0   Networks

A computer network consists of two or more computers that are connected together. They could be in the same room, in the same building or on opposite sides of the world.

There are several benefits to using a network:

- If you have two PCs but only one printer, the PCs can both connect up to the printer and share it.

- As well as sharing resources such as printers, PCs on a network can also share files and data. Instead of making lots of copies of a file, like a company letter, one copy could be stored on a particular PC and everyone could read it.

- To help people work together better, users can send messages to each other through their connected computers - this is called electronic mail, or email.

Server

Shared laser printer.

Network laser printer.

Shared deskjet printer.

Workstation
(Client)

A **workgroup** is a group of computers on a network that can share **data** (folders and files) and **resources** (printers, modems etc).

The advantages or using a workgroup are:

- Resources can be dedicated to specific groups of computers (i.e., departments can share they own set of resources).

- Access to resources can be password protected.

- All workgroup computers can share a single store of data.

- Reduces costs as devices can be shared (instead of say, a printer for each computer in the workgroup).

- **Network Cards**

 A network card is used to link to another PC or several PCs in a network.

There are two main types of network:

- **LAN (Local Area Network)**: This is a small network, connecting computers spread out over a fairly small, local area - either in the same building or in a few buildings.

  LANs are connected by a system of cables that allows the computers talk to each other. The computers must also have network cards installed in order to get them to connect to the network.

  In general, there is no more than 1km between any two extremities of a LAN. An individual computer on a network is known as a **workstation**. The workstation is connected to a **server**.

  The server will generally run a network operating system and provide services such as shared data stores, access to software, communication services (email boxes etc) and internet access.

  Different **network drives** may also appear on the list of drives available when a user logs-into the network (via a **username** and **password**).

- **WAN (Wide Area Network)**: This is a larger network, connecting computers spread out over a wide area - usually around the whole country, or around the world.

  WANs use the telephone cables (the **PSDN** - **Public Switched Data Network**) in addition to satellite, radio and other communication methods. Satellite and radio connections can save companies having to lay lots of extra cable, but it means they have to use special equipment to send their information.

  WANs also use more powerful computers as servers (such as mainframes or minicomputers). WAN's are often groups of individual LANs spread over a number of sites and connected using various communication links.