2. Software:

The set of instructions that tells the computer what to do is called the computer *software* or *program* the user will need to have *application software* such as word processor, graphics design software, a game or a Web browser.

The User Interface:

To enter data or program instructions, to request that a file be saved or printed, or simply to view the information that has been produced the user will need a *user interface*.

Types of User Interface:

1) **Command-based interface:** When using a command-based interface such as MS-DOS, the user has to remember (or look) up a variety of commands and their various options or parameters, making it difficult for novice users to operate.

2) **Menu-driven Interface:** A menu-driven user interface allows the user to select from a *menu*, a predefined list of available options or selections. This is already an improvement on the command-driven interface, since the user no longer has to rely on memory to remember the available options or commands.

3) **Graphical User Interface:** The graphical user interface (GUI) is currently the most popular interface on PCs. It requires a high-resolution graphics monitor. Active applications will have their own *window*, which can be re-sized at will, often overlaying windows of other applications.

4) **Pen-based Interface:** Pocket computers and handheld computers are generally too small to incorporate a keyboard. Instead, many combine the liquid crystal display (LCD), which is the output screen, with a pressure sensitive layer that can be used for input. All user input happens by means of a pen-like pointing device.

5) **Natural Language Interface:** Voice input and output based on a limited set of stored sounds is readily available across all computer platforms, and is widely used by the visually impaired, and for hands-free data input.

Application Software:

- ***General purpose applications*** assist a wide variety of users with common information processing tasks such as word processing, web browsing, electronic mail, and scheduling or data management.

- ***Business applications*** aim to automate common, generic business functions or processes. They include debtors, creditors, general ledger, inventory management, and sales processing.

- ***Scientific applications*** are focused on the needs of scientists and researchers: astronomy, weather forecasting, *geographical information systems (GIS)*, statistics, simulations, engineering drawings, etc.

- **Finally,** there is a large category of applications that do not fit in any of the above categories, such as computer-based training software or games.

Programming languages:

The systems are developed by means of *programming languages*: artificially constructed languages to code the instructions for a computer. These languages have their own vocabulary, grammar (*syntax*), constructs and have often been designed to meet the demands of developing certain types of applications. Let us look at the various types of programming languages.

- **First generation: machine Language:** The lowest level in which programs can be written is *machine language (ML)*. This is the binary code that can be interpreted directly by the CPU.

- **Second generation: assembler language:** The development of *assembler languages* represented a big improvement by replacing the binary code with symbols that are easier to remember.

- **Third generation procedural languages:** Many different 3GLs have been developed during the 60s and 70s. Some of the more successful ones were BASIC ("Beginner's All-Purpose Instruction Code"), COBOL ("COmmon Business Oriented Language"), FORTRAN ("FORmula TRANslation language"), and many more.

- **Object-oriented languages:** The first step in developing an object-oriented application is to identify suitable *objects.* These can be physical entities such as an employee; or they could be informational entities such as report.

Operating System:

The operating system is an essential piece of software that resides on every computer. It allows the computer to run a number of different applications, and shares resources such as printers between a numbers of different users.