


# Information Technology Concept



# Chapter 7

## Computer System Concepts



# What is a Computer ?





## Definition of Computer

- The computer is an electronic device capable of performing several tasks, which receives input, processes the input according to the instructions, keep the commandments and the results of its processing, and provides output in the form of information (Blissmer, 1985).
- The computer is an electronic system to manipulate data quickly and accurately as well as designed and organized in order to automatically receive and store input data, process it, and produce output based on the instructions that have been stored in the memory (Sanders, 1985).



# Computer

An electronic equipment that can receive and process data into information, run programs stored in memory, and can work automatically with certain rules.



## Data - Information

- **Input (Data):** a collection of events raised from the fact (fact), may be numbers, letters, special symbols, or a combination of all three.
- **Data Processing:** manipulation of data into a form that is more useful and meaningful, in the form of information.
- **Information:** data processing activities results that provide a more valuable form of an event.  
Data processing using a computer known as electronic data processing (EDP).

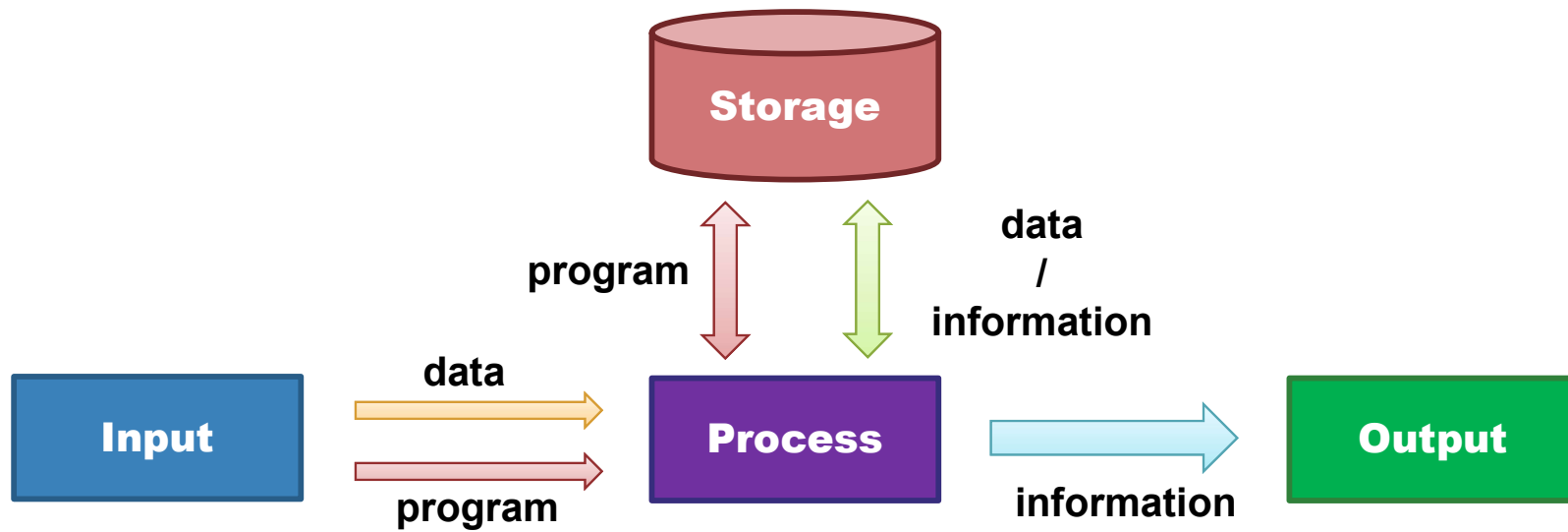


## Electronic Data Processing (EDP)

- Data is a collection of events that removed from reality (facts), can be numbers, letters, special symbols, or combination of all three.
- Data still can not tell you much that needs to be further processed.
- Electronic data processing is a process of manipulation of data into a form that is more meaningful in the form of an information by using an electronic device, namely computer.



## Electronic Data Processing (EDP)







## Electronic Data Processing (EDP)

- Electronic data processing is automatic information processing. It uses the computers to collect, manipulate, record, classification and to summarize data.
- In the modern age, electronic data processing is a generic term that signifies the gathering, intelligent analysis, and manipulation of data that is put to work.



## Components of Electronic Data Processing (EDP)

- In order to process data into information a computer must be used in the context of a computer system.
- Any data processing system comprises 4 basic components:
  - *Hardware*
  - *Software*
  - *Procedure*
  - *Brainware*



## EDP Component - *Hardware*

- Hardware: electronic equipment or components that provide resources for computing. Hardware is a recognizable and observable physical entity.
- Hardware can operate based on predetermined orders (instruction set). Hardware can perform various task that have been determined by the giver of the instruction..



## EDP Component – *Hardware (cont.)*

- Computer hardware contains five sections depending on its functionality:
  1. *Input device*: a piece of equipment used to provide data and control signals to an information processing system such as a computer or information appliance.
  2. *Process device*: any device in a computer that handles the intermediate stage of processing the incoming data.



## EDP Component – *Hardware (cont.)*

3. *Output device*: any piece of computer hardware equipment which converts information into human-readable form. It can be text, graphics, tactile, audio, and video.
4. *Storage device*: any non-volatile data storage that will retain a computer's data. A technology consisting of computer components and recording media that are used to retain digital data.
5. *Peripheral device*: computer hardware that functions as an additional unit to a computer. any of various devices (including sensors) used to enter information and instructions into a computer for storage or processing and to deliver the processed data



## Hardware – Input Device

■ computer hardware that functions as a tool to provide data or commands into the computer.

■ Examples of *input device*:

- Keyboard
- Mouse
- Touchpad
- Microphone
- Webcam
- Scanner





## ***Hardware – Process Device***

- The main and most important processing unit in a computer system that controls the entire data processing process, like reading data from input equipment, processing data, generate output information to the output equipment.
- Processing devices are the components responsible for the processing of information within the computer system. This includes devices such as the CPU, memory and motherboard.



## Hardware – Process Device - Processor

- The processor is one of the important computer components that functions to process data and control the existing systems on the computer.

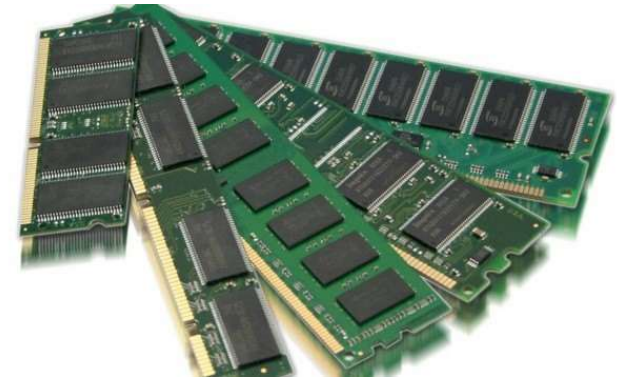






## Hardware – Process Device - RAM

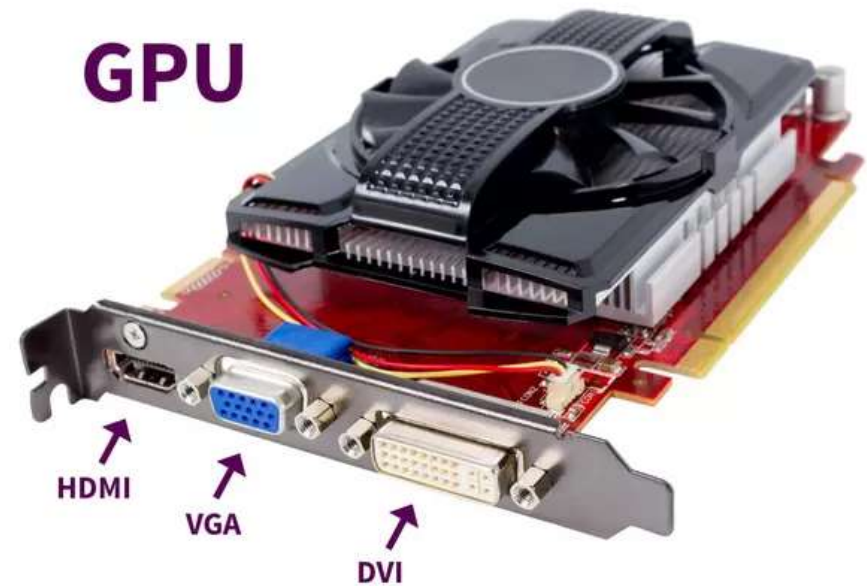
- *RAM (Random Access Memory)* is the main memory in a computer. RAM is volatile memory used to hold instructions and data of currently running programs. It loses integrity after loss of power but provide very fast data transfer to CPU.





## Hardware – Process Device – Video Card

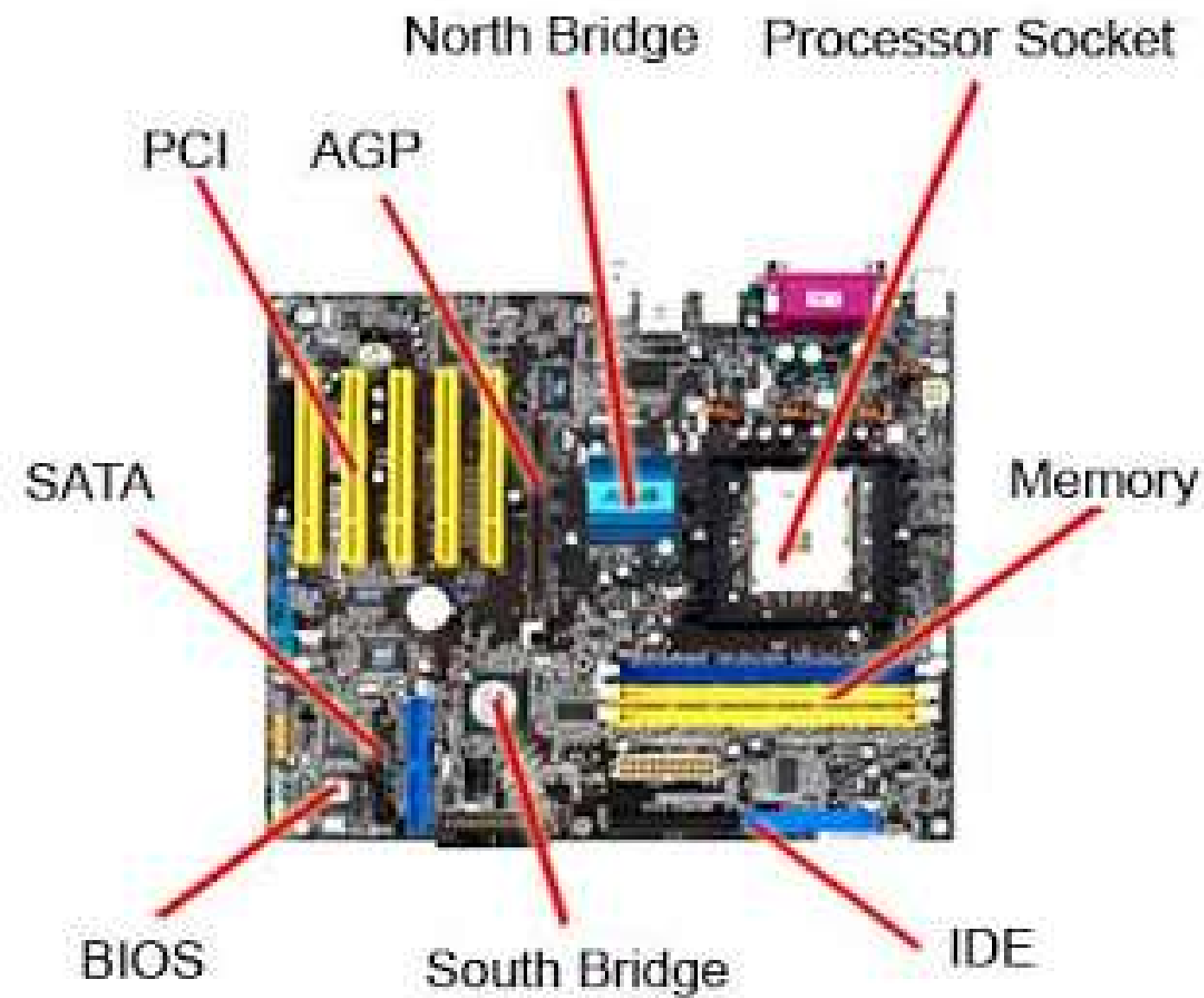
- *Video card (GPU - Graphics Processing Unit)* is a chip or electronic circuit capable of rendering graphics for display on an electronic device.





## **Hardware – Process Device - Motherboard**

- *Motherboard (mainboard)* is a main circuit board that connects various electronic components to the computer.
- A motherboard is the main printed circuit board in general-purpose computers and other expandable systems. It holds and allows communication between many of the crucial electronic components of a system, such as the central processing unit and memory, and provides connectors for other peripherals.





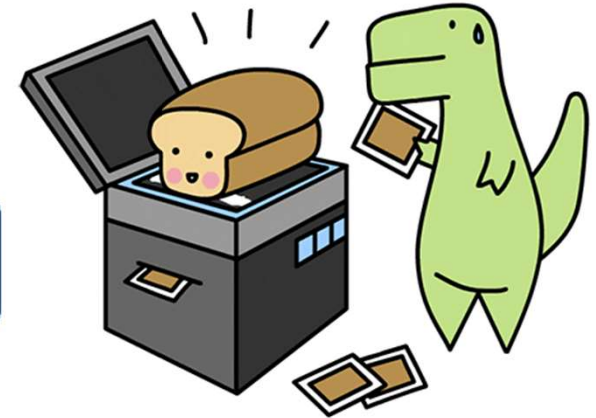
## ***Hardware – Output Device***

- Output device : any piece of computer hardware equipment which converts information into human-readable form. It can be text, graphics, tactile, audio, and video.
- Examples of output device:
  - *Monitor*
  - *Printer*
  - *Photocopy*
  - *Speaker*



## Hardware – Output Device (Cont.)

- The output results are classified into 2; *hardcopy* and *softcopy*



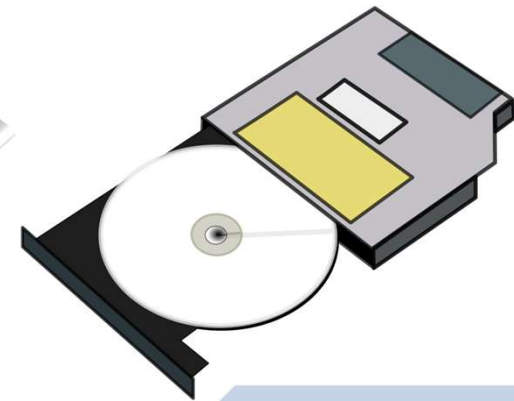
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## Hardware – Storage Device

- *Storage Device* is a storage medium provided for storing programs and data on a computer. A piece of hardware that is primarily used for storing data.
- Examples of *storage device*:

- *Harddisk*
- *Floppy Disk*
- *Flashdisk*
- *CD-ROM*
- *DVD-ROM*







## Hardware – Peripheral Devices

- An internal or external device that connects directly to a computer or other digital device but does not contribute to the computer's primary function, such as computing.
- Peripheral devices generally provide extra function and data input and output functionality to the computer systems.

- Examples:

- *Modem*
- *LAN Card*
- *WIFI Card*







## EDP Component - *Software*

- *Software*: a set of instructions, data or programs used to operate computers and execute specific tasks.
- *Software as a connection between humans (users) and computer hardware.*
- In the context of a human-computer program interaction, it converts human language into machine language to ensure computer hardware recognizes the needs of the user and follows the instructions given.

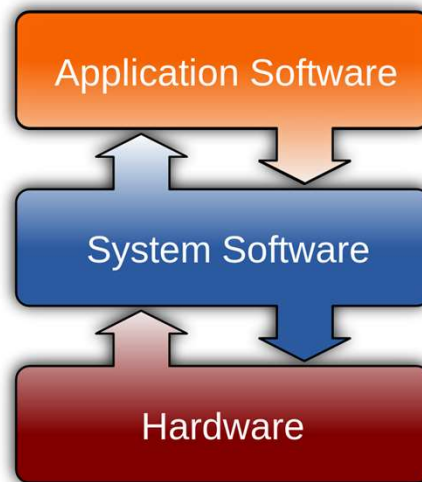


## EDP Component – Software (Cont.)

■ two main classifications of software

### 1. System Software

- Firmware
- Operating System
- Driver
- Utility
- Programming Language
- Etc.



### 2. Application Software

- Media player
- Text Editor
- ERP
- Financial Software
- Etc.



## Software - Firmware

- A specific class of computer software that provides the low-level control for a device's specific hardware.
- A computer program that is *embedded* in a hardware device and is an essential part of the hardware.
- Programmed to provide instructions (controls) to communicate with other devices and perform functions such as basic input / output tasks.
- Example: BIOS, Microcontroller in Remote Control, etc



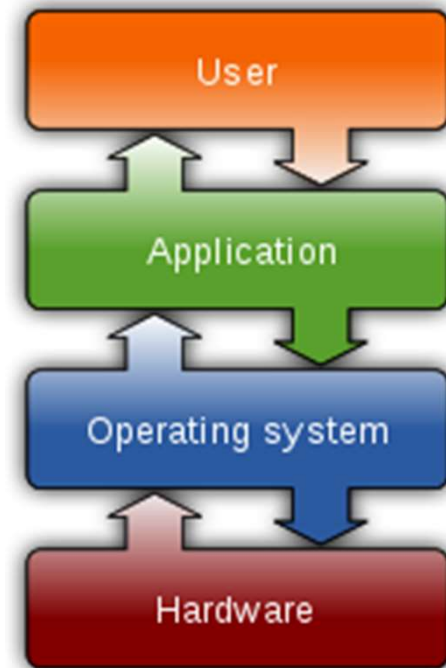
## ***Software – Driver (Device Driver)***

- A program that lets the operating system communicate with specific computer hardware.
- Drivers act as translators between hardware and programs with the operating system that uses them.
- Drivers are intermediaries between the operating system and hardware components
- Example: driver for GPU, driver for MB, mouse, keyboard, LAN, WIFI, dll



## Software – Operating System

- a program that functions to control the basic work method to manage input work, output media, coding tables, memory, processor scheduling, etc.
- The operating system functions as a connection between humans and the hardware and software to be used.
- Example: DOS (Disk Operating System), Windows, Linux, Machintos

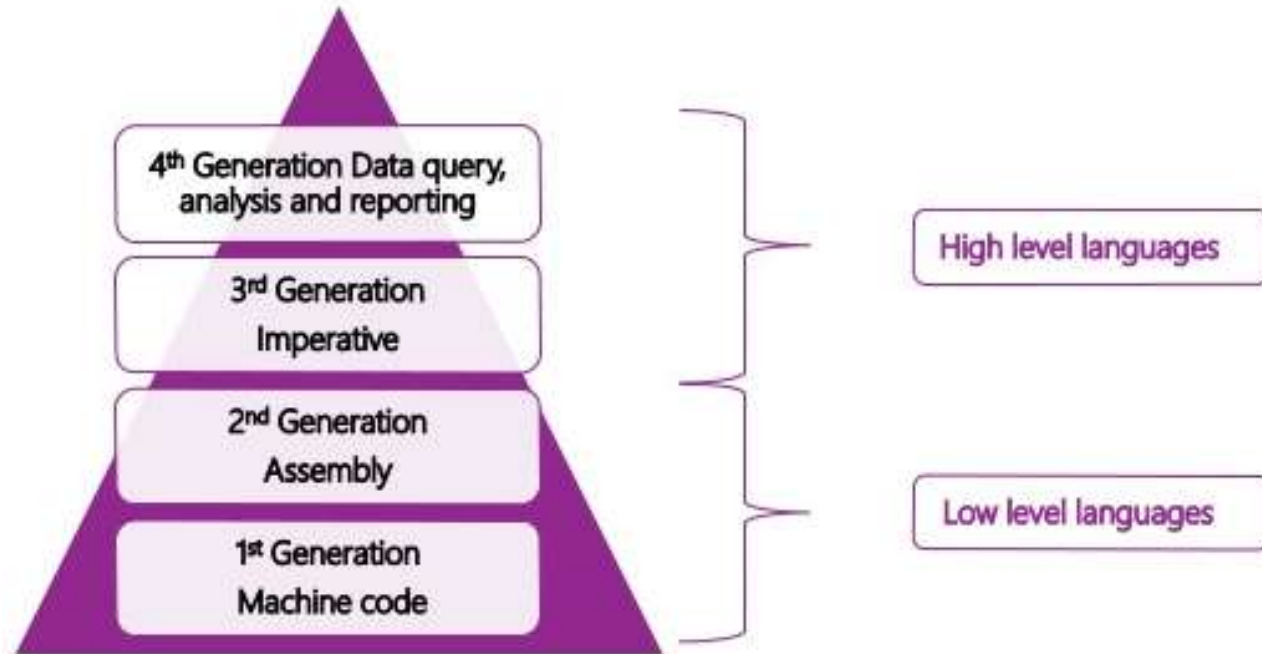
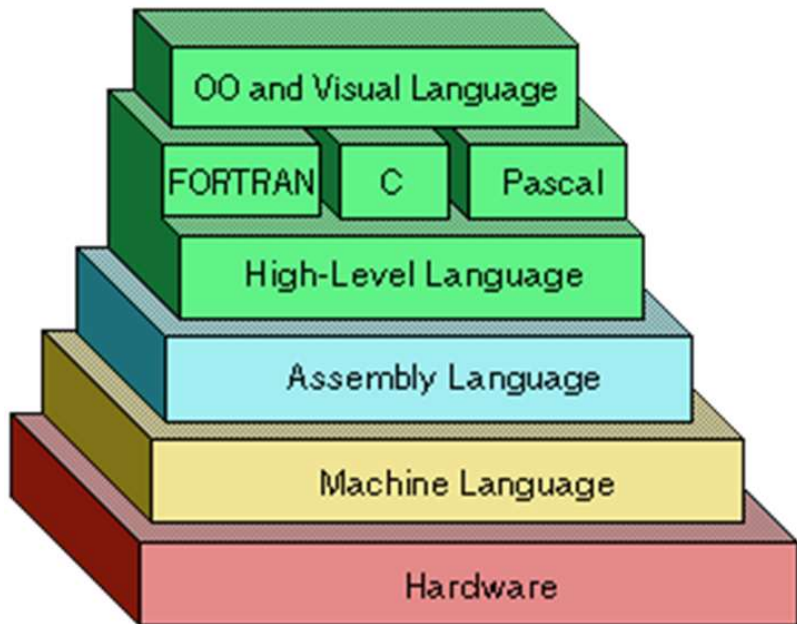




## **Software – Programming Language**

- A program used to translate instructions written by humans into machine language with certain rules or procedures.
- A programming language is a formal language comprising a set of commands, instructions, and other syntax that produce various kinds of output.
- Programming Language level:
  1. Machine Language
  2. Assembly Language (*low-level language*)
  3. High-level language

# Programming Language





## EDP Component – Procedure

Certain basic steps are often followed in digital data processing, regardless of the industry or the type of data being collected.

- Data Capture – Acquisition of data in some format
- Data Conversion – Transforming data into digital format
- Data Validation – Evaluation of data to ensure whether it is in the correct format
- Sorting – Grouping similar data streams
- Data Aggregation – Combining data streams
- Data Analysis – Processing of the data using formulas and other transformative techniques
- Data Reporting – Creation of human-readable reports





## EDP Component - *Brainware*

- Brainware or computer users is a key element in a computer system in order to function and be useful.
- Brainware is responsible for running, supervising and managing computer systems.
- People who create, administer, and feed the EDP system constitute the final element.



## EDP Component – *Brainware (Cont.)*

Brainware is generally divided into 4;

1. **Systems Analysts:** performs problem analysis, designs solutions in the form of computer programs.
2. **Programmers:** Translating designs made by analysts into a specific programming language (coding)
3. **Operators/Data entry specialists:** run the computer according to the instructions given and entering data into the system.
4. **Technicians:** assembles / maintains computer hardware



**Any Question?**