COMPUTER:

GENERAL INTRODUCTION

COMPUTER

Introduction

- A computer is a man made electronic machine with stores, reads and processes data to produce meaningful information as output.
- It works very fast and does not make mistakes but it's capacity is limited.
- It is made of English word to compute.

Skilloma®

Processing

Chip

Keyboard & mouse

Input

Storage

Hard disk

Output

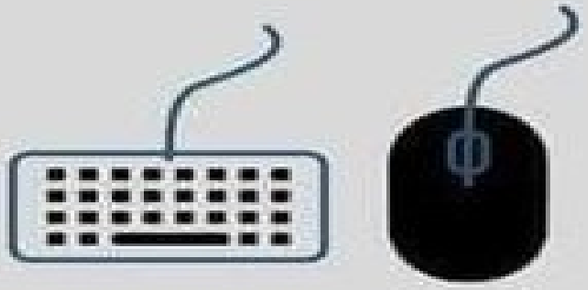
Printer

Introduction

- It operates under the control of a set of instructions that is stored in its memory unit
- A computer accepts data from an input device and processes it into useful information which it displace on its output device.

WORKING PRINCIPLE OF COMPUTER-

Input → Processing → Output



Input Unit
Keyboard,
Mouse

CPU-
Central
Processing
Unit

Output Unit
Monitor,
Printer

Introduction

- Actually, a computer is a collection of hardware and software components that helps us to accomplish many different tasks.
- Hardware consist of the computer itself and includes a CPU, a monitor, a keyboard, a mouse and any equipment connected to it.
- Software is the set of instructions that the computer follows in performing a task.

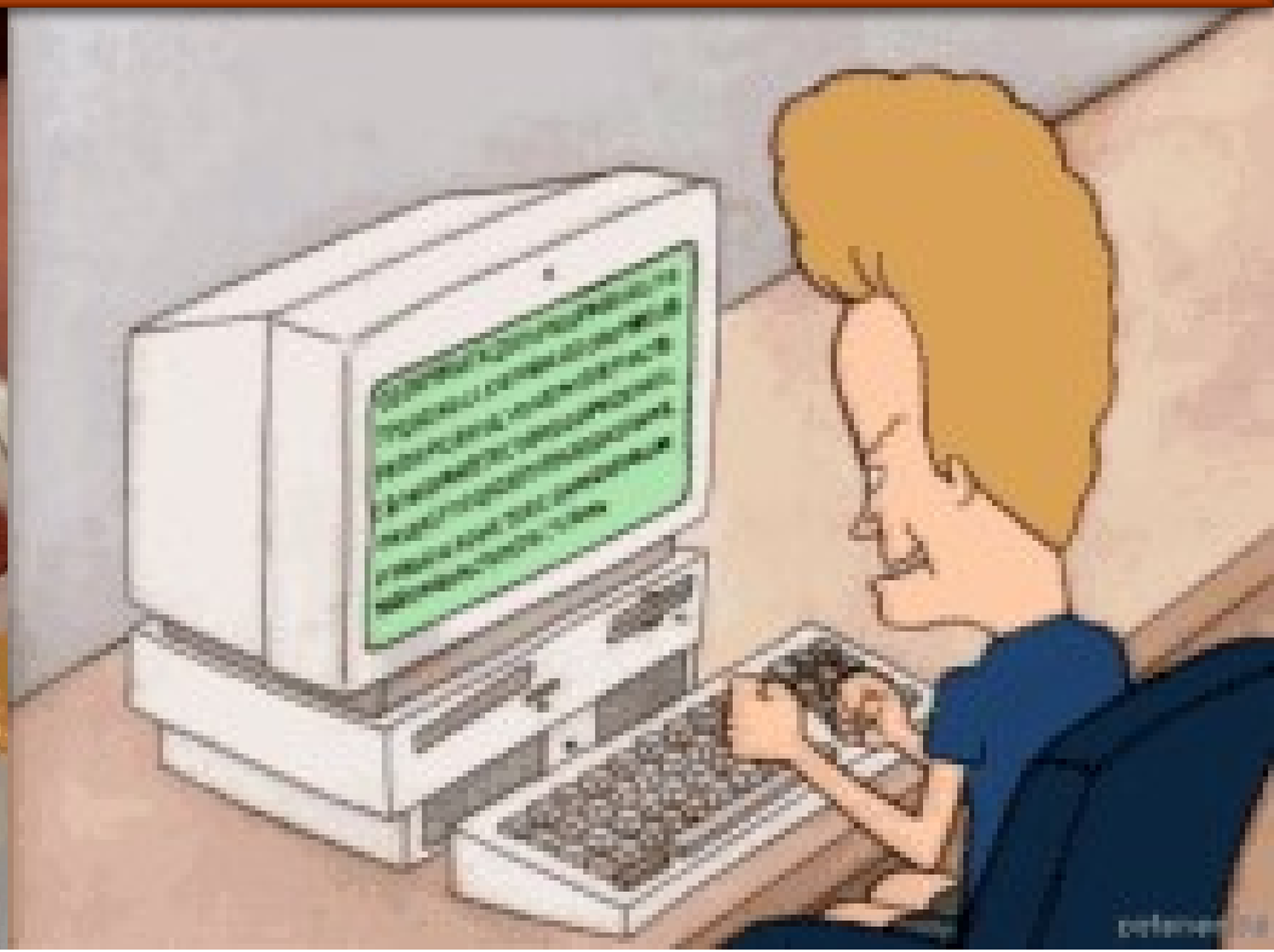
Hardware

Software

Computers and calculators

- A calculator is a small electronic device used for doing mathematical calculations.
- A calculator cannot be used for writing letters or drawing images, while a computer can be used to calculate, draw images, write letters, and do many other things as well.

Calculators and Computers



Human being and computers

- Computers cannot work on their own.
- They do what we want them to do, only we give them the right command.
- Its memory is better than human memory.
- It can't forget anything it has saved so it has called an artificial intelligence.


MADE
FOR YO

HUMAN BEINGS	COMPUTERS
human beings are slow in doing calculations.	Computer computers can do complex calculations in seconds.
human beings cannot remember lots of things at one time.	computer can store and remember a large amount of information at one time.
human beings can make mistakes.	computers do not make mistakes.
human beings have feelings.	computers do not have feelings.
human beings can think	computers cannot think.
human beings get tired if they work for long hours.	computers never get tired.

Human being and computers

Elementary words related to computer

- Data : Data is information required by the computer to be able to operate or to put it the other way information we put into the computer is called data.
- It is gathered from any source but cannot be organized.
- It cannot be used for decision making.

Elementary words related to computer

- It is a collection of unprocessed items and combination of characters, numbers and symbols collected for a specific purpose.
- Generally it is divided into three types : Numeric data, Alphabetic data and Alphanumeric data.

Elementary words related to computer

- **1. Numeric data :** Numeric data consists of ten digits 0,1,2,3,4,5,6,7,8,9.
- There are different types of number system that are used to represent numeric data.

Difference between Data and Information

DATA

Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.

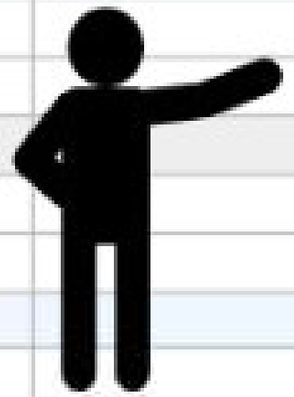
INFORMATION

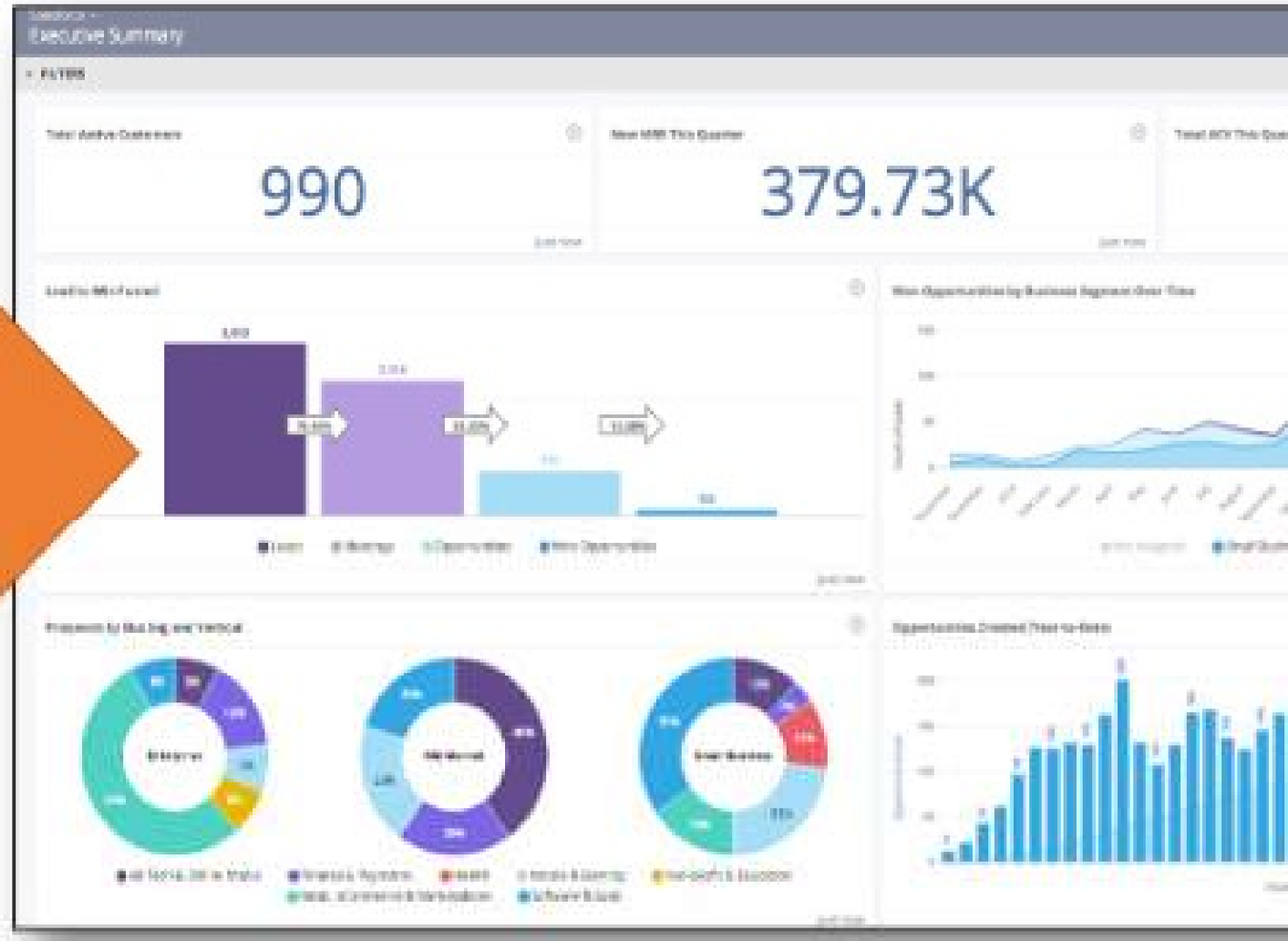
When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.

Data

Information

	tryint
Combined_Sector	14625
Combined_Sector	10125
Combined_Sector	4500
ss	1350
mer	3150
Combined_Sector	5625
ss	4950
mer	675
Combined_Sector	4500
Combined_Sector	1890
ss	855
mer	1035
Combined_Sector	2610
ss	1215
mer	1395





DATA

Data is collection of facts

Data is unorganized.

Data does not depend on information

Data isn't sufficient for decision-making

VS

INFORMATION

Information puts facts into context.

Information is organized

Information depends on data.

Information is sufficient for decision -making

Elementary words related to computer

- These number systems are decimal number system, binary number system, octal number system and hexadecimal number system.
- Examples are examination score, bank balance and pin-code etc.

Numbering System

System	Base	Digits
Binary	2	0, 1
Octal	8	0,1,2,3,4,5,6,7
Decimal	10	0,1,2,3,4,5,6,7,8,9
Hexadecimal	16	0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F

Elementary words related to computer

- **2. Alphabetic Data :** Alphabetic data is due to represent 26 alphabetic.
- It consist of capital letters from A to Z, small letters from a to z and blank space.
- Alphabetic data is also called non-numeric data.
- An example is the address of an employee.

Elementary words related to computer

- **3. Alphanumeric Data :** Alphanumeric Data is used to represent alphabetic data, numeric data, special characters and symbols.
- An example is any password.

	A	B
1	Alphanumeric	Numbers
2	ABC123	123
3	XYZ345	345
4	Excel321	321
5		

Elementary words related to computer

- Information : Information is well organized data which we get up the processing of data and its helps in decision making.
- It is process data that is organized, meaningful, and useful.

CHARACTERISTICS OF COMPUTER

SPEED

ACCURACY

AUTOMATIC

STORAGE

VERSATILITY

DILIGENCE

RELIABILITY

LOW COST &
REDUCE SIZE

NO FEELING
& NO IQ

SECRECY

Characteristics of a computer

- Computers are the foundation of business, travel, and leisure of life today.
- The common characteristics that make computers of all sizes such a powerful machine are speed, accuracy and reliability, storage capacity, ability to operate automatically, diligence, scientific approach and versatility.

Characteristics of a computer

- **1. Speed :** Computers provide the processing speed required by all facets of society.
- The quick service we expect at the bank, at the grocery store, on the stock exchange, and on the Internet are dependent on the speed of computers.
- The speed of a computer is measured in the following time units for the access time or instructions per second.


1G
2G
3G
4G
5G
HIGH SPEED

Characteristics of a computer

Millisecond (1 ms)	A thousand of a second or 10^{-3}
Micro second (1 ms)	A million of the second or 10^{-6}
Nano second (1 ns)	A thousand million of a second or 10^{-9}
Pico second (1 ps)	million millionth of a second or10^{-12}
KIPS	kilo instructions per second
MIPS	million instructions per second.

Characteristics of a computer

- **1. Accuracy and Reliability :** Computers are quite accurate and extremely reliable as well.
- They are only a machine and do not make errors on their own.
- Errors are caused by humans, not by computers.

Characteristics of a computer

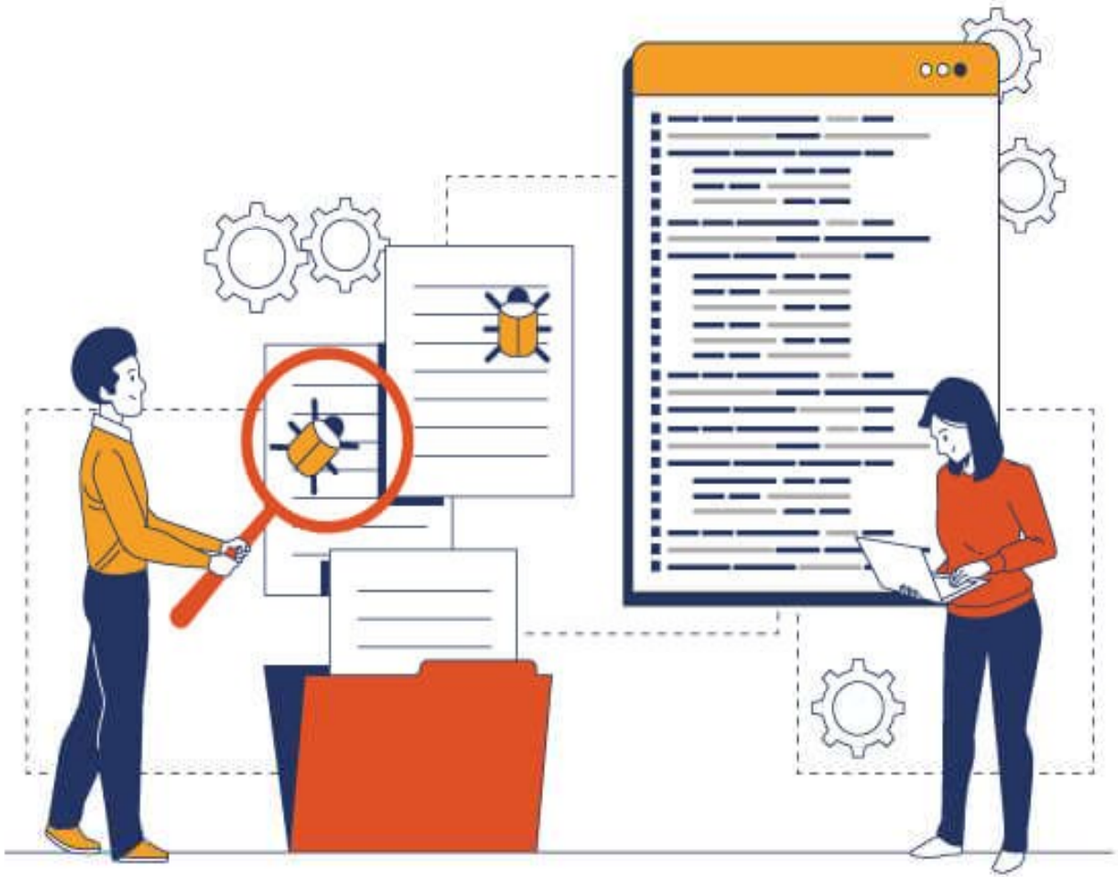
- **2. High storage Capacity :** Computers are capable of storing enormous amount of data that must be located and retrieved very quickly.
- The capability to store and retrieve volumes of data is a core of the Information Age.


M = 5.9736 × 1024 kg
CONFERMA
H_2O

Characteristics of a computer

- **3. Automation :** Once a process has been initiated it is capable of functioning automatically.
- It does not require an operator at each stage of the process.

headspin



Manual Testing

Automation testing

Characteristics of a computer

- **4. Diligence :** it is capable of operating at exactly the same level of speed and accuracy even if it has to carry out the most voluminous and complex operations for a long period of time.
- It does not suffer from physical and mental fatigue, lack of concentration and laziness.

Diligence of Human & Diligence of Computer

Characteristics of a computer

- **5. Versatility :** The wide use of computers in so many areas such as commerce, scientific applications, education in day to day life is ample evidence of its versatility.

USES OF COMPUTER

Basic applications/uses of a computer

- **1. Entertainment or Recreation :** Computer is used for playing games, listening to music and watching movies.
- It is also used for making cartoon movies, animation films and drawing pictures etc.

PLAYING GAMES

LISTENING MUSIC

WATCHING MOVIE

Basic applications/uses of a computer

- **2. Education : C**omputer is used in schools for teaching doing mathematical calculations and completing homework.

EDUCATION USING COMPUTER

CALCULATIONS USING COMPUTER

Basic applications/uses of a computer

- **3. Banks :** Computer is used in banks for storing information about different account holders, keeping a record of cash and providing all kinds of information regarding any account in the bank.
- It is also used by ATM (Automatic Teller Machine) of a bank which provides cash without any bank staff.

COMPUTER USING

IN BANKS

Basic applications/uses of a computer

- **4. Railway stations and Airports:** Computer helps in providing information about seat availability, booking tickets and keeping records of all passengers.
- It helps in providing information about the arrival and departure as well as timing of trains and airplanes.

RAILWAY STATIONS AND AIRPORTS USING COMPUTER

Basic applications/uses of a computer

- **5. Medical Science :** Computer helps in keeping records of all the patients in a hospital and doing a number of medical test.
- It helps doctor in controlling machines in an operation theatre.

MEDICAL SCIENCE USING COMPUTER

Basic applications/uses of a computer

- **6. Business :** Computers are used to type and print documents, letters etc.
- They help in keeping records of employees and sending e-mails etc.

BUSINESS USING COMPUTER

Basic applications/uses of a computer

- **7. Defence :** In defence computer is used to help in building weapons, controlling their functions, launching missiles and keeping record of criminals.
- It helps in establishing communication links between the soldiers and their commanders through satellites.


AFNETOPS/CC Vision
Stripes Crew Assignments
AFNOC Mission

Basic applications/uses of a computer

- **8. Designing :** Computer helps in designing magazines, newspaper books and advertisements etc.
- It also helps in designing buildings houses etc.

Basic applications/uses of a computer

- **9. Scientific Research :** Computer is used in scientific research and is handy for all kinds of scientific research.
- **10. Administration :** Computer is used to improve administrative services and their efficiency.

Basic applications/uses of a computer

- **11. Publication :** Computer is used in desk-top publication.
- **12. Communication :** Computers are used in communication such as e-mail, chatting etc.

PUBLICATION USING COMPUTER

Limitations of a computer

- **1. lack of intelligence (programmed by human/Can't think) :** Though computer is programmed to work efficiently, fast and accurately, but it is program by human being to do so.
- Without a program, computer is nothing.

Limitations of a computer

- A program is a set of instructions.
- Computer only follows these instructions.
- If the instructions are not accurate you working of computer will not be accurate

Limitations of a computer

- **2. Prone to virus : T**he computer sometimes malfunctions and results in loss of data if some virus attacks.
- **3. Depends on electricity :** One of the limitations also includes machine failure in case of some hardware or software problem.
- The computer complaint results in loss of data is power fails.


VIRUS DETECTED
SCAN NOW
Click here for more information


VIRUS

Functions of a computer

- **1. Data Collection :** Data collection is a process of preparing and collecting data to obtain information to keep on record, make decisions and pass information to others.
- Computers collect or gather data, which means that they allows users to input data


17
NEWS
MAP

Functions of a computer

- **2. Data Storage :** Data storage means that it retains digital data used for computing at some interval of time.
- **3. Data Processing :** Data processing is a process to convert data into information

DATA STORAGE

Functions of a computer

- **4. Data Output :** It is a process data which we get as an output.

Impact of computerization

i. Time saving
ii. Errorless work
iii. Saving of paper
iv. Unemployment

Data processing and electronic data processing

- In the past, manual techniques used for collecting, manipulating and distributing data to achieve certain objectives, were known as Data Processing.
- As Technology advances, computers are used to achieve results accomplished by humans and machines.
- Example : calculator, typewriter and computer.
- This is known as Electronic Data Processing (EDP)


CASIO
MC
MR
M-
M+
%
OFF
CE
ON/C
W

Data processing and electronic data processing

- The major objective of data processing is to get the wizard information from any raw data.
- Data refers to raw facts that are gathered from any source but are not organized.
- That data cannot be used to make decisions.

Data processing and electronic data processing

- Information, thus, refers to process data which is well organized or presented in the meaningful fashion and increase the understanding of the data.
- This help in the decision making.
- Processing involves transforming input into output

Computer system

- A group of equipment put together to process a data is called the computer system.
- A computer system consists of several components to achieve electronic data processing.

Computer system

- **1. Input Units :** they are devices which accept data from user and transmit it to the central processing unit as electronic pulses.
- For example, the ATM (Automatic Teller Machine) system, when we want to withdraw, we are required to enter our Personal Identification Number (PIN).
- When we enter our PIN, we using an input device, the keypad.

ATM (Automatic Teller Machine)

Computer system

- **2. CPU (Central Processing Unit) :** It is an abbreviation for central processing unit, and is pronounce a separate letters.
- The Central Processing Unit is the brain of the computer sometimes referred to simply as the central processor, but commonly called a processor.
- The Central Processing Unit is the unit we are most calculations take place.

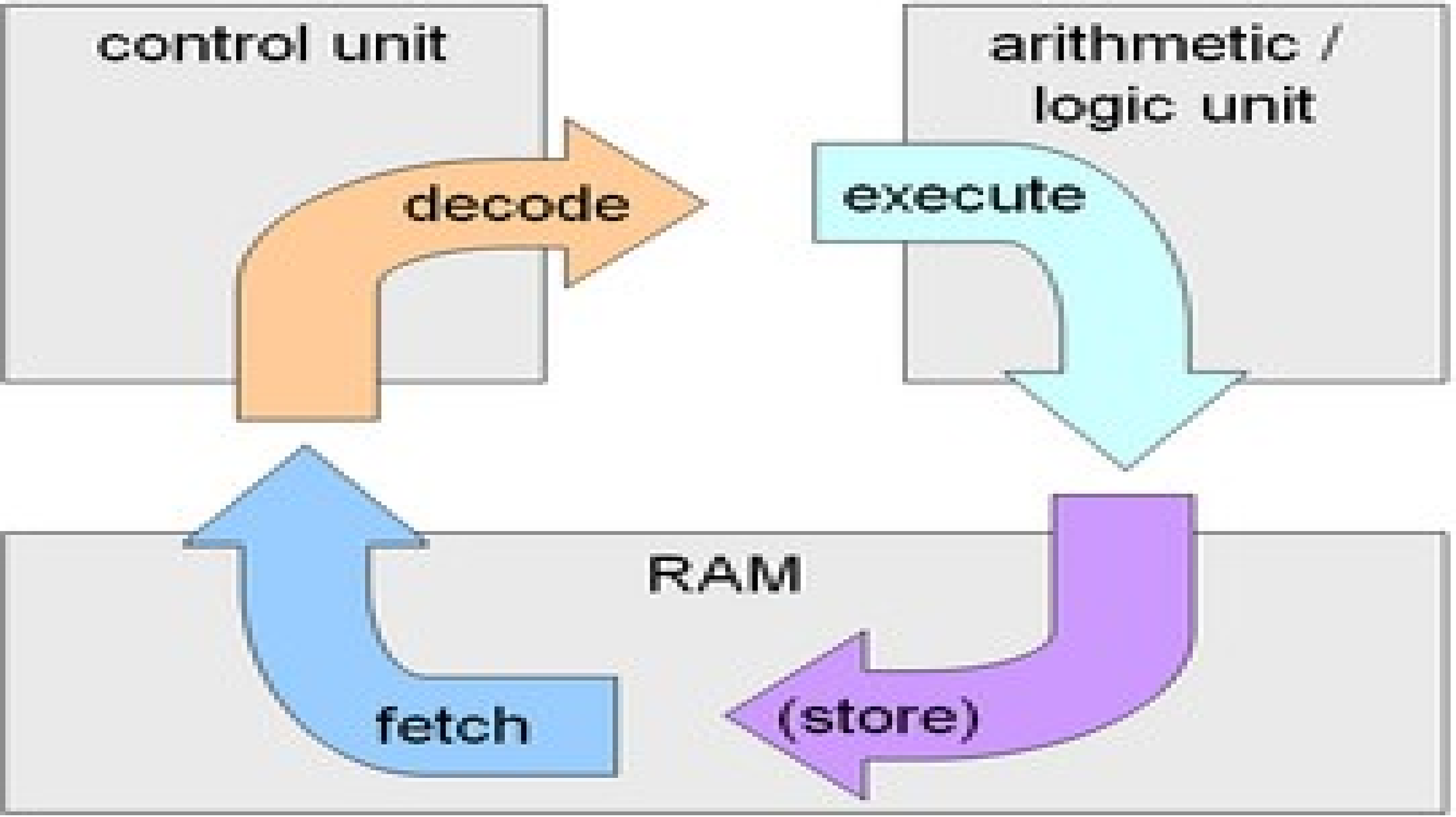

intel
CORE™ i9
9th Gen

Computer system

- It is linked with the input units and output units to form the computer system.
- In terms of computing power, the CPU is the most important components of a computer system.
- On personal computer (PC) and small workstation, the CPU is housed in a single chip for microprocessor or microchip.

Computer system

- The fundamental sequence of steps that a CPU performs is also known as the fetch-execute cycle or instruction cycle.
- It is the time in which a single instruction is retrieved from memory, (decoded determine what actions instruction requires) and executed (carried out those actions).


control unit
arithmetic /
logic unit
decode
execute
RAM
fetch
(store)

Computer system

- The first half of the cycle transfers the instruction from memory to the instruction register and decodes it.
- The second half executes the instruction.
- The cycle is repeated continuously by the CPU from start or boot-up to the time when the computer is shut down.

Instruction Cycle

- Each computer's CPU can have different cycles this on instruction sets, but will be similar to the following cycle –
- **1. Fetch the instruction :** The CPU patches the instruction from main memory via the data bus, and it is then placed into CIR.
- The Program Counter is instructed to contain the address of the next instruction.

Instruction Cycle

- **2. Decode the instruction :** The Instruction decoder instructions.
- If an instruction has an indirect address, the effective address is read from main memory, and any required data is fetched from main memory to be processed and then placed into data registers.

Instruction Cycle

- **3. Execute the instruction :** The CU passes are decoded information as a sequence of control signals to the relevant functions units of the CPU.
- To perform the actions required by the instruction, such as reading values from registers, passing them to the ALU to perform mathematical or logical functions on them.

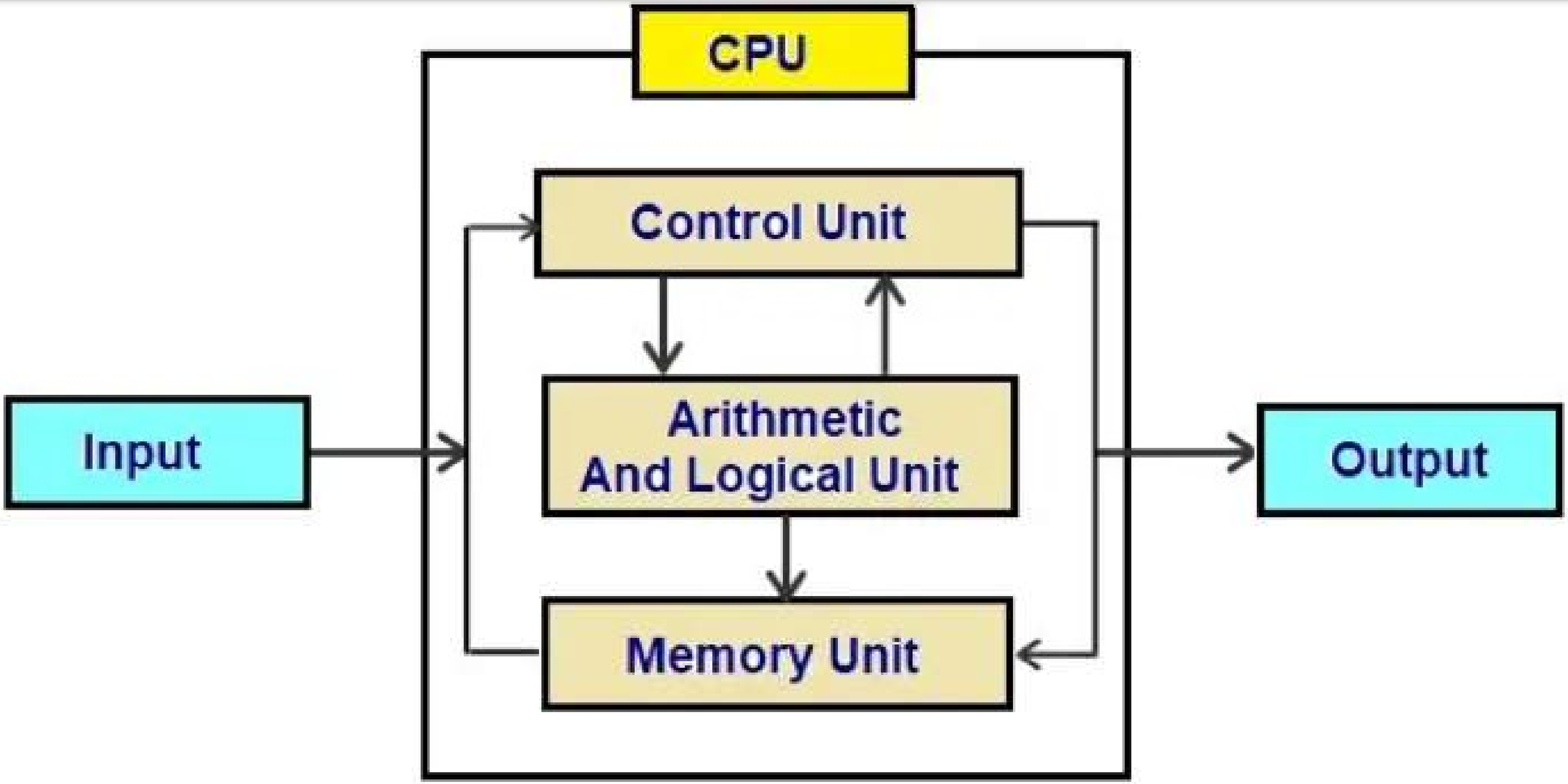
Instruction Cycle

- And writing the result back into a register.
- If the ALU is involved, its sense for condition signal back to the CU.

Instruction Cycle

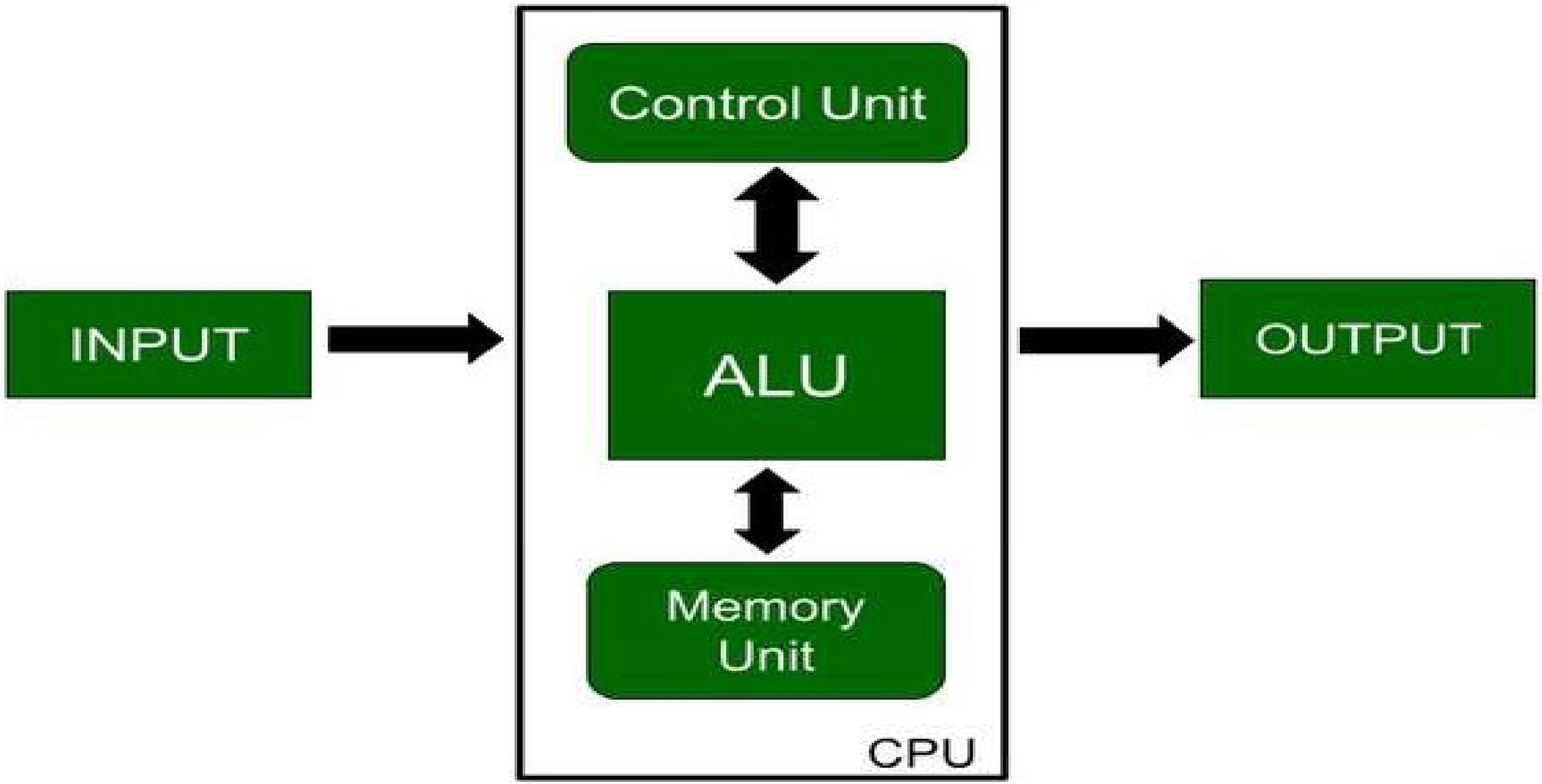
- **4. Store Results :** The result generator by the operation is stored in the main memory, or send to an output device.
- Based on the condition of any feedback from the ALU, Program Counter maybe updated to a different address from which the next instruction will be fetched.
- The cycle is then repeated.

Block Diagram



There are two main components of a CPU

- **A. The Arithmetic Logic Unit (ALU) :** It performs all arithmetic operations and decision making
- **Data transfer :** which includes moving of data from one location to another within the computer.
- **Arithmetic operation :** it includes addition, subtraction, multiplication, and division etc.


Control Unit
INPUT
ALU
OUTPUT
Memory Unit
CPU

There are two main components of a CPU

- **B. Decision making :** it is an ability to compare two quantities and perform logical operations such as compare true or false etc.

There are two main components of a CPU

- The Control Unit (CU) : it extracts instructions from the memory and decodes and executes them, calling on the ALU, when necessary.
- It controls all functions and coordinates all components of computer.
- Its is in charge of fats execution cycle.

Functions of Control Unit

- **1.Control flow of data :**
  - From input devices to memory
  - From memory to output devices or secondary storage
  - From secondary storage to memory
  - From ALU to memory
  - From memory to ALU

Functions of Control Unit

- **2.Coordinates instructions execution :**
  - Fetch the instruction
  - Execute the instruction
  - Decode the instruction
- More components of CPU, that are vital to its operation, are the registers which are very small memory locations that are responsible for holding the data that is to be processed.

Functions of Control Unit

- **3.Output units :** Devices which accept information from CPU and convert it to human readable form.
- For example, when we pay the cashier in the supermarket, he will give a receipt.
- This receipt is a form of output from the output device known as printer.


SALE!!!
20% OFF
CASHIER
WELCOME

Functions of Control Unit

- **GIGO (Garbage in Garbage out) :** It is a concept of computer science that the quality of output is determined by the quality of input, means wrong input will result in wrong output.
- It is related to accuracy of input and output.


THANK
YOU