

1) Definitions:

- 1) Compiler:
 - 1) Computer program that translates/transforms source code in one programming language to another computer language.
 - 2) Eg: .java is compiled to .class(contains assembly language)
- 2) Decompiler:
 - 1) Program that translates low-level language to a high-level language
 - 2) Eg: Java class files
- 3) Transpiler(source-to-source compiler):
 - 1) Translates between high level language
 - 2) Eg: we write code using TypeScript in Angular, but the issue is TypeScript is not browser readable, so what happens is that when we compile the Angular code the TypeScript code **Transpiled** to JavaScript which is browser readable.
- 4) Language Rewriter:
 - 1) Translates form of expressions without changing the language
- 5) Interpreter:
 - 1) It is a computer program that directly executes the program without previously compiling it to a machine language program.
 - 2) General Strategies used:
 - 1) Parses the code and performs the behaviour directly
 - 2) Translates the source code into some intermediate representation and executes
 - 3) Executes the stored pre-compiled code made by a compiler which is part of the interpreter system.

2) Computer Networks:

- 1) Definition:
 - 1) Computer Network/Data Network, it is telecommunication network that allows computer to exchange data.
 - 2) Data is passed to each other using data-connections and in the form of packets
 - 3) The connection, can be established using
 - 1) Cable media eg: ethernet
 - 2) Wireless media eg: router
- 2) Types:
 - 1) Local Area Network(LAN):
 - 1) Small network
 - 2) Confined to a building or office floor
 - 2) Wide Area Network(WAN):
 - 1) Two or more LANs connected together
 - 2) Eg: internet
 - 3) Metropolitan Area Network(MAN):
 - 1) Covers large area such as city.
- 3) Components:
 - 1) Repeaters:

- 1) Amplify the data-signal due to attenuation
- 2) Hubs:
 - 1) Concentrator to connect several computers
- 3) Switches:
 - 1) Intelligent hubs that segment traffic to avoid collision
- 4) Routers:
 - 1) wireless
 - 2) They must be able to access the internet
- 4) Topologies:
 - 1) Definition:
 - 1) It is the arrangement with which computer networks devices are connected to each other
 - 2) Eg:
 - 1) Bus
 - 2) Ring
 - 3) Star
 - 4) Mesh
 - 5) Tree
 - 6) Pont-to-Point
- 5) IP address:
 - 1) Definition:
 - 1) IP -> Internet Protocol
 - 2) IP address -> it is a numerical label assigned to each device connected to a computer network
 - 2) Parts:
 - 1) Host/Network Interface Identification
 - 2) Local Addressing
 - 3) Two Versions:
 - 1) IPv4 : 32bit
 - 1) Eg: 192.168.1.24 -> 4 numbers each of 8 bit (0-255) -> total size -> $4 \times 8 = 32$ bit
 - 2) IPv6: 128 bit
 - 4) Classes:
 - 1) Class A(1.0.0.1-126.255.255.254),
Class B(128.1.0.1-191.255.255.254),
Class C(192.0.1.1-223.255.254.254) -> used for common purpose
 - 2) Class D(224.0.0.0-239.255.255.255) -> multi-casting
 - 3) Class E(240.0.0.0-254.255.255.254) -> Reserved for future use
- 6) Protocols:
 - 1) Established rules that dictates us how to format, transmit and receive data
 - 2) If two h/w devices support the same protocol, they can communicate with each other
 - 3) Eg:

- 1) TCP/IP (Transmission Control Protocol/Internet Protocol)
 - 2) UDP (User Datagram protocol)
 - 3) SMTP (Simple Mail Transfer Protocol)
 - 4) FTP (File Transfer Protocol)
 - 5) HTTP (HyperText Transfer Protocol)
- 7) Internet:
- 1) Connection of networks
 - 2) Each network will have its own unique IP
 - 3) Characteristics:
 - 1) Global system of interconnected computer networks
 - 2) Uses TCP/IP
 - 3) Every computer in the internet is having its own unique IP
 - 4) DNS(Domain Name Server) -> used to give name to IP
 - 5) Accessible to users all over the world
- 8) Intranet:
- 1) It is a system in which multiple PCs are connected to each other
 - 2) These PCs are not visible to the outside world
 - 3) Eg: there are certain websites that can be accessed using college net only
 - 4) Each PC in the intranet will have its own unique IP

3) System Computing:

- 1) Serial Computing(Traditional Approach):
 - 1) A problem is broken into discrete series of instructions
 - 2) Instructions they are executed sequentially
 - 3) Executed on a single processor
 - 4) One instruction may execute at any moment
- 2) Parallel Computing:
 - 1) Simultaneous use of multiple compute resources to solve a problem
 - 2) A problem is divided into discrete parts which can be solved concurrently
 - 3) Each part is further broken down to a series of instructions
 - 4) Each of these instructions are executed on different processors
- 3) Concurrent Computing:
 - 1) The different processes can execute on different computers in a multi-processing system.
 - 2) Speeds up the computation
- 4) Distributed Computing:
 - 1) In this a system components located on a network communicate and coordinate their actions by passing messages.