Computer Science M3 – Unit 1

Midterm Short

Internet history

The Internet is a global network that connects computers worldwide and allows people to share inormation instantly.

The Internet has two main components: **network protocols and hardware**

Protocols are a set of rules for communication. Without these rules, computers would not be able to communicate.

Hardware includes everything from the computer to the smartphone that is used to access the Internet. Other types of hardware include satellites, radios, cellphone towers, routers...

Packet switching is a process of transferring information from one device to another device. Each computer connected to the internet is assigned a unique IP address that allows the device to be recognized.

The Internet is a global connection of networks. **WWW or Web** is a collection of information that can be accessed using the Internet. The Internet is the infrastructure and the Web is a service on top.

Web development

Client-side is the part of the websites that is shown to the users (you) of the website.

Server-side is the part of the website that does all the communication with the client and the database.

Request-response is a way of communication between client and server. Client sends a request (question) to the server, and the server responds (answers) back to that question.

Protocols

Common Internet protocols are **TCP/IP, UDP, HTTP, FTP**

TCP/IP → Transmission Control Protocol gives reliable, ordered, and error-checked delivery of data between applications on the internet.

UDP → User Datagram Protocol is used for real-time data; there is no guarantee of the delivery of information. UDP is useful where we do not want to check for errors, for real-time applications.

HTTP → Hypertext Transfer Protocol is an **application protocol** for websites (hypermedia information system). HTTP functions as a **request-response** protocol in the **client-server model.**

FTP → File Transfer Protocol is used for the transfer of computer files between a client and server.

IP address

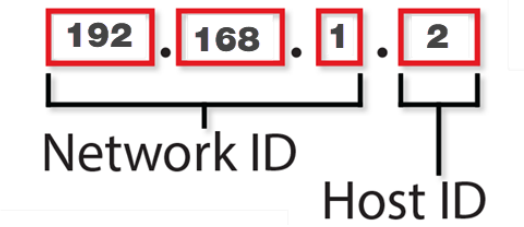
An **IP address** is used to identify every computer in the network, as every computer has a different IP address. An IP address is made out of 4 parts separated by dots:

192.168.1.25

Each part is called an **octet**, which means it is made out of 8 bits, or 32 bits on total. The numbers in an IP address can only be between 0 and 255.

But an IP address is not enough to find out which computer is in the network. So, we have to divide the IP address into two parts: network ID and host ID.

For example:



NETWORK ID DOESN'T HAVE TO BE ALWAYS FIRST 3 NUMBERS, IT CAN SOMETIMES BE EITHER THE FIRST ONE ONLY, OR FIRST TWO, OR EVEN ALL FOUR.

Subnet mask

Subnet mask divides our IP address into the network ID and host ID.

Net bits are the number of bits that we reserve for the subnet mask.

- Example:
    - /24 → we are reserving 24 bits for the subnet mask → 11111111.11111111.11111111.00000000 → 255.255.255.0
    - /18 → we are reserving 18 bits for the subnet mask → 11111111.11111111.11000000.00000000 → 255.255.192.0