

Course: Computer applications/Skills/ITC/CAB
Semester: 4th
Total Marks: 50
Due Date: 25th Sep,2020

Program: BS
Major Assignment
Instructor: Zakir Rahim

Instructions:

- Students are required to solve the provided assignment and upload it on SIC in due time.
 - The solutions can be type-written or hand-written.
 - In case of handwritten solutions, you are required to copy pictures of the solved assignment in Ms-Word and upload it.
 - The solutions must be uploaded either in Ms-Word format or pdf format.
 - Students are required to save the file with their name and student id. For example ahmad_12345.
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Q1. (a) Differentiate between open source software and applications software? (6)

(b) Write different features of system software? (6)

Q2. (a) Discuss different functions of operating system? (6)

(b) Explain the use of File Transfer Protocol and TelNet services ? (8)

Q3. (a) Explain Metropolitan Area Network (MAN) with a suitable example? (7)

(b) Define topology? Which topology would you chose to setup a local area network and why? (7)

Q4. In your opinion, what are the different types of common media used for storage, access and transmission of information? Explain each type in detail? (10)

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SECTION...A

Q1....a...

Ans.... Open Source Software..

Open source software has a close meaning to free software, although the two terms are not identical. Although both terminologies refer to a similar group of licenses and software, each term alludes to different underlying ideologies.

The Open Source Initiative (OSI), the non-profit organization that supports the development of open source software, asserts that any open source software must adhere to the following criteria:

- Free redistribution of the software.
- The source code should be publicly available.
- The software can be modified and distributed in a different format from the original software.
- The software should not discriminate against persons or groups.
- The software should not restrict the usage of other software.

Historically, the term free software came before open source. Although both terms have roots in supporting the idea of free software (right to use, study, share, and modify), their objectives and philosophies are different.

The term open source was introduced in the late 1990s in response to the limitations of free software. In fact, the OSI says that it coined the term to “educate and advocate for the superiority of an open development process.”

The organization adds that the term provides “a valuable way to engage with potential software users and developers, and convince them to create and improve source code by participating in an engaged community.”

Therefore, the term open source emphasizes on the practical benefits of “free software”: supporting collaboration on software development projects.

In other words, while open source is a development philosophy that is more business oriented, free software is a social and moral philosophy. That’s why the term open source is more palatable to the corporate world because it places less emphasis on freedom.

For example, while the Android mobile operating system is an open source software, it cannot be referred to as a free software because it does not respect all four pillars of freedom.

To minimize misunderstandings and avoid the terminology debate between free software and open source software, other terms such as FOSS (free and open source software) and FLOSS (free, libre, and open source software) may be used to describe the concepts.

Freeware.. Typically, freeware refers to a software that you can use without incurring any costs. Unlike open source software and free software, freeware offers minimal freedom to the end user.

Whereas it can be used free of charge, often modification, redistribution, or other improvements cannot be done without getting permission from the author.

As such, freeware is often shared without including its source code, which is atypical to open source software or free software.

Two of the most common types of freeware are Skype and Adobe Acrobat Reader. While both programs are free to use, their source codes are unavailable to the public.

Most developers usually market freeware as freemium or shareware with the intention of encouraging users to buy a more capable version.

Freemium refers to a program that is offered at no cost, but money (premium) is paid for extra, more capable features.

Shareware refers to a program that is initially available without any costs attached, and users are encouraged to distribute copies. However, that cost-free period usually lasts for a certain period; thereafter, a user is required to pay for continued use

Conclusion... So, the next time you build your tech product — whether it's a mobile game, a cryptocurrency trading bot, or a website — ensure that you use the right terminology to describe it.

For example, if you want to release your created program freely to the open source community, ensure you do sufficient research to understand the limitations and responsibilities of the licensing you select.

Application Software..

Application Software is a program that does real work for the user. It is mostly created to perform a specific task for a user.

Application Software acts as a mediator between the end-user and System Software. It is also known as an application package. This type of software is written using a high-level language like C, Java, VB, Net, etc. It is a user-specific and is designed to meet the requirements of the user.

You can also install multiple Application Software on a single System Software. You can store this kind of software on CDs, DVDs, flash drive, or keychain storage devices. Example: Word-processing, Spreadsheet, Database, etc.

One of the first things to understand about the term “application software” is that it is exceedingly broad.

Application software is commonly defined as any program or number of programs designed for end-users. That's it, in a nutshell.

In that sense, any end user program can be called an “application.” Hence the age-old saying: “there's an app for that.”

People often use the term “application software” to talk about bundles or groups of individual software applications, using a different term, “application program,” to refer to individual applications.

That's because the word “program” correlates to a discrete, countable single unit, while the word “software” is often used to refer to more than one individual program.

Examples of application software include items like Microsoft Word, Microsoft Excel, or any of the web browsers used to navigate the Internet ... or the actual software suites themselves, if they are intended for end users.

Another way to understand application software is to contrast it with other software. In a very basic sense, every program that you use on your computer is a piece of application software.

The operating system, on the other hand, is system software. Historically, the application was generally born as computers evolved into systems where you could run a particular codebase on a given operating system.

Q1...b...

Ans... **An important feature of System Software are:**

- **System Software** is closer to the **system**.
- Generally written in a low-level language.
- The **system software** is difficult to design and understand.
- Fast in speed.
- Less interactive.
- Smaller in size.
- Hard to manipulate.

Q2...a...

Ans...Definition of operating system..

The main function of an Operating System is to manage the computer resources well. This function is carried out with the help of the user and hence user interface should be proper and well maintained. Functions of OS help the user to do the tasks assigned to the system and it helps to do it in a proper manner. The services are provided to the user in the form of application software. Also controlling the device for several functions help the user to perform the tasks. Security and storage are the other areas where OS focus to do the system tasks and to help the user.

Functions of Operating System..

- 1.** Security is provided by OS to the user data and prevents unauthorized access. Data can be protected by giving the password to the files. When an unknown user checks the files, OS asks for the password and hence the data is protected. The system itself is protected with a password. This helps in checking the persons who log into the system.
- 2.** System performance is boosted with the help of the OS. It monitors the response time taken by the system after the service request. If there is any unusual variation in the time, OS monitors the system performance and brings the issue into the user's notice. High variation or very low variation can be the result of any virus attack. The user is notified to bring the necessary changes.
- 3.** Various applications or tasks and the number of users doing the tasks are accounted for by OS. This helps to know the number of users and the

frequency of application usage. Hence storage can be allocated to the system for those applications that have more usage. This helps to track the user and also various tasks that take up the storage of the system.

- 4.** The computing system shows some errors due to the changes in the hardware and these errors are logged in the OS. This log helps the user to identify the errors in the hardware or software and to make necessary changes in the system. This prevents the malfunctioning of the computing device.
- 5.** Many users use the computing system. OS helps to collaborate and coordinate the interpreters, compilers, and assemblers. This maintains the order of the system and the users are not confused with the functioning of various software.

There are many... But we discuss only five...

Q2...b...

Ans... File Transfer Protocol

- File Transfer Protocol (FTP) is a client/server protocol used for transferring files to or exchanging files with a host computer. It may be authenticated with user names and passwords. Anonymous FTP allows users to access files, programs and other data from the Internet without the need for a user ID or password. Web sites are sometimes designed to allow users to use 'anonymous' or 'guest' as a user ID and an email address for a password. Publicly available files are often found in a directory called pub and can be easily FTPed to a user's computer. FTP is also the Internet standard for moving or transferring files from one computer to another using TCP or IP networks.
- File Transfer Protocol is also known as RFC 959.

The original FTP specification was written by Abhay Bhushan and published as RFC 114 on April 16, 1971. This was later replaced by RFC 765 (June 1980). The current specification is RFC 959 (October 1985). RFC stands for request for comments.

The first FTP client applications used the DOS command prompt with standardized commands and syntax. Since then, many graphical user interface (GUI) clients have been developed within operating systems, making it easier for the user to upload and download files.

There are various uses for and types of FTP:

1. An FTP site is a web site where users can easily upload or download specific files.
2. FTP Explorer is an FTP client based on Windows 95 file manager (Windows 95 Explorer).
3. An FTP server is a dedicated computer which provides an FTP service. This invites hackers and necessitates security hardware or software such as utilizing usernames, passwords and file access control.

4. An FTP client is a computer application which accesses an FTP server. While doing so, users should block incoming FTP connection attempts using passive mode and should check for viruses on all downloaded files.

Telnet.. Telnet service enables an internet user to log in to another computer on the internet from

his/her local computer. That is, a user can execute the telnet command on his/her local

computer to start a login session on a remote computer. This action is also called "remote

login".

To start a remote login session, a user types telnet command and address of the remote

computer on his/her local computer. The remote computer then authenticates the user by

asking him/her to enter a login name and password. If the user specifies a correct login

name and password, the remote computer logs in the user and telnet command then enters

input mode. From now onwards, anything that the user types on the local computer is sent

to the remote computer for processing.

Some common uses of telnet service are:

1. For using computing power of a remote computer.
2. For using some software on a remote computer, which is not available on user's local computer.

3. For logging in to one's own computer from another computer.

Q3...a...

Ans...MAN...

A metropolitan area network (MAN) is similar to a local area network (LAN) but spans an entire city or campus. MANs are formed by connecting multiple LANs. Thus, MANs are larger than LANs but smaller than wide area networks

(WAN).

MANs are extremely efficient and provide fast communication via high-speed carriers, such as fiber optic cables.

- A MAN is ideal for many kinds of network users because it is a medium-size network. MANs are used to build networks with high data connection speeds for cities and towns.

The working mechanism of a MAN is similar to an Internet Service Provider (ISP), but a MAN is not owned by a single organization. Like a WAN, a MAN provides shared network connections to its users. A MAN mostly works on the data link layer, which is Layer 2 of the Open Systems Interconnection (OSI) model.

Distributed Queue Dual Bus (DQDB) is the MAN standard specified by the Institute Of Electrical And Electronics Engineers (IEEE) as IEEE 802.6. Using this standard, a MAN extends up to 30-40 km, or 20-25 miles.

Example... Examples of a **MAN** are the part of the telephone company network that can provide a high-speed DSL line to the customer or the cable TV network in a city. WAN or Wide Area Network is a computer network that extends over a large geographical area, although it might be confined within the bounds of a state or country.

Q3...b...

Ans... metropolitan area network (MAN)

A metropolitan area network (MAN) is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but smaller than the area covered by a wide area network (WAN). A metropolitan area network (MAN) is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but

smaller than the area covered by a wide area network (WAN). The term is applied to the interconnection of networks in a city into a single larger network (which may then also offer efficient connection to a wide area network). It is also used to mean the interconnection of several local area networks by bridging them with backbone lines. The latter usage is also sometimes referred to as a campus network. metropolitan area network (MAN) is a computer network that interconnects users with computer resources in a geographic region of the size of a metropolitan area. The term MAN is applied to the interconnection of local area networks (LANs) in a city into a single larger network which may then also offer efficient connection to a wide area network. The term is also used to describe the interconnection of several local area networks in a metropolitan area through the use of point-to-point connections between them. A Metropolitan Area Network (MAN) is one of a number of types of networks (see also LAN and WAN). A MAN is a relatively

new class of network, it serves a role similar to an ISP, but for corporate users with large LANs. There are three important features which discriminate MANs from LANs or WANs. Use of MANs to provide regional networks which share the cost of access to a WAN

Examples of metropolitan area networks of various sizes can be found in the metropolitan areas of London, England; Lodz, Poland; and Geneva, Switzerland. Large universities also sometimes use the term to describe their networks. A recent trend is the installation of wireless MANs.

(b) Define topology? Which topology would you chose to setup a local area network and why?

Ans. The way computers are connected together in a network is called Network topology.

Network topology is the arrangement of the elements (links, nodes, etc.) of a

communication network .Network topology can be used to define or describe the

arrangement of various types of telecommunication networks, including command and control radio networks, industrial fieldbuses and computer networks.

Network topology is the topological structure of a network and may be depicted physically or logically. It is an application of graph theory wherein communicating devices are modeled as nodes and the connections between the devices are modeled as links or lines between the nodes. Physical topology is the placement of the various components of a network (e.g., device location and cable installation), while logical topology illustrates how data flows within a network. Distances between nodes, physical interconnections, transmission rates, or signal types may differ between two different networks, yet their logical topologies may be identical. A network's physical topology is a particular concern of the physical layer of the OSI model.

Examples of network topologies are found in local area networks (LAN), a common computer network installation. Any given node in the LAN has one or more physical links to other devices in the network; graphically mapping these links results in a geometric shape that can be used to describe the physical topology of the network. A wide variety of physical topologies have been used in LANs, including ring, bus, mesh and star. Conversely, mapping the data flow between the components determines the

logical topology of the network. In comparison, Controller Area Networks, common in vehicles, are primarily distributed control system networks of one or more controllers interconnected with sensors and actuators over, invariably, a physical bus topology.

- In local area networks where the star topology is used, each machine is connected to a central hub. In contrast to the bus topology, the star topology allows each machine on the network to have a point to point connection to the central hub and there is no single point of failure.

- Bcz Star network is used to transmit data across the central hub between the network nodes. When a packet comes to the hub it transfers that packet to all nodes connected through a hub but only one node at a time successfully transmits it....

Q4. In your opinion, what are the different types of common media used for storage, access and transmission of information? Explain each type in detail?

Ans.

Ans. There are various types of storage media, including magnetic tape, nonvolatile memory cards, rotating fixed disk and solid-state drives (SSDs), which are based on nonvolatile flash memory. The term storage encompasses all data, and can be either

primary or secondary storage

Types of Transmission Media

In data communication terminology, a transmission medium is a physical path between the transmitter and the receiver i.e. it is the channel through which data is sent from one place to another. Transmission Media is broadly classified into the following types:

1. Guided Media:

It is also referred to as Wired or Bounded transmission media. Signals being transmitted are directed and confined in a narrow pathway by using physical links.

Transmission Media is broadly classified into the following types:

Guided Media: It is also referred to as Wired or Bounded transmission media. ...

(i) Twisted Pair Cable – ...

(ii) Coaxial Cable – ...

(iii) Optical Fibre Cable – ...

Unguided Media: ...

(i) Radiowaves –

(ii) ... (ii) Microwaves – ...

(iii) Infrared –

Transmission media is a communication channel that carries the information from the sender to the receiver. Data is transmitted through the electromagnetic signals. ...

Transmission media is of two types are wired media and wireless media.

Transmission media refer to the media through which data can be carried from a source to a destination. Data is transmitted from one device to another through electromagnetic signals. ... The different categories of transmission media include guided (or wired) and unguided (or wireless) media..

The end..

