

Course: Computer applications/Skills/ITC/CAB

Semester: 4th

Total Marks: 50

Due Date: 25th Sep,2020

Starting the name of ALLAH

Program: BS

Major Assignment

Instructor: Zakir Rahim

Name: AMJAD ULLAH

Student I'D: 15985

Department : BS, RADIOLOGY

Summer Exam: Final Term

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?

- **Ans. Open source software (OSS) refers to the software which uses the code freely available on the Internet. The code can be copied, modified or deleted by other users and organizations. As the software is open to the public, the result is that it constantly updates, improves and expands as more people can work on its improvement. Open-source software (OSS) is a type of computer software in which source code is released under a license in which the copyright holder grants users the rights to use, study, change, and distribute the software to anyone and for any purpose. Open-source software may be developed in a collaborative public manner. Open-source software development can bring in diverse perspectives beyond those of a single company. A 2008 report by the Standish Group stated that adoption of open-source software models has resulted in savings of about \$60 billion (£48 billion) per year for consumers.**
- **Application software (app for short) is a program or group of programs designed for end users. Examples of an application include a word processor, a spreadsheet, an accounting application, a web browser, an email client, a media player, a file viewer, simulators, a console game or a photo editor. The collective noun**

application software refers to all applications collectively. This contrasts with system software, which is mainly involved with running the computer.

- **Application software is a type of computer program that performs a specific personal, educational, and business function. Each program is designed to assist the user with a particular process, which may be related to productivity, creativity, and/or communication. Application software is a set of one or more programs, which solves a specific problem or does a specific task. For example, payroll processing software, photo editing software, Graphic designing software etc.**

Functions of Application Software

Application software programs are created to facilitate a variety of functions, including but not limited to:

managing information

manipulating data

constructing visuals

coordinating resources

calculating figures

(b) Write different features of system software?

Ans. Features of System Software

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

System software is crucial for the effective functioning of a system.

System software are independent of the application software

Users never interact with system software as it functions in the background.

Capable of running independently

Installed on the computer system at the time when the operating system is installed.

The System Software is a general-purpose software

The System Software is a general-purpose software

Software and its types

A computer cannot do anything on its own. We need to give programs to it to make it do a job desired by us.

The term software refers to a set of computer programs that solves different problems or a specific type of job. For example, MS-Word, Excel etc.

Types of Software:

We classify most software into two categories:

- i. System Software**
- ii. Application Software**

System software:

System software is a set of one more programs, which controls the operation and/or extends the processing capability of a computer system. In general, a computer's system software performs one or more of the following functions.

- Supports development of other application software.**
- Supports execution of other application software.**
- Monitors effective use of various hardware resources such as CPU, memory, peripherals etc.**
- Communicates with and controls operation of peripheral devices such as printer, disk, tape**

Hence, system software makes the operation of a computer system more effective and efficient.

It helps hardware components work together. Some commonly known types of system software are:

Operating system (Microsoft windows, Apple Macintosh, Linux), utility programs (help users in system maintenance), Communication Software.

Application Software:

Application software is a set of one or more programs, which solves a specific problem or does a specific task. For example, payroll processing software, photo editing software, Graphic designing software etc.

We can obtain the desired software in one or more ways, which are described below:

Pre-written software:

Thousands of pre-written software packages are available today. If we can find a software package that meets our requirements, purchasing it is the best option.

- **Pre-written software packages usually cost less**
- **Pre-written software packages are usually general purpose.**
- **Pre-written software packages usually satisfy the needs of many individuals.**

Customized Software:

If none of the available pre-written software packages meet the specific requirements of a user, it becomes necessary for the user to create a customized software package. The user might get the required software created by another organization or can create the software if he/she has knowledge of software development.

Public-Domain Software

Public-Domain software is software available free or for a nominal charge from the bulletin boards or user-group libraries on the internet. Basic objective is to popularize their software to as many users as possible. Users are encouraged to copy such software and try them out. Usually, the creators share the software freely with other users. Public-domain software is also referred to as freeware/shareware.

Some of the public-domain software's are also for trial period.

Another type of public-domain software's becoming popular is those that come with their source code. These software's are referred to as Open Source Software. Usually, open source software allows a user to download , view, modify and distribute modified source code to others. It must be remembered that not all open source software are free and not all free software is necessarily open source.

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

Ans. An Operating System (OS) is an interface between a computer user and computer hardware. An operating system is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.

Some popular Operating Systems include Linux Operating System, Windows Operating System, VMS, OS/400, AIX, z/OS, etc.

Definition

An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of programs.

Following are some of important functions of an operating System.

- **Memory Management**
- **Processor Management**
- **Device Management**
- **File Management**
- **Security**
- **Control over system performance**
- **Job accounting**
- **Error detecting aids**
- **Coordination between other software and users**

Memory Management

Memory management refers to management of Primary Memory or Main Memory. Main memory is a large array of words or bytes where each word or byte has its own address.

Main memory provides a fast storage that can be accessed directly by the CPU. For a program to be executed, it must in the main memory. An Operating System does the following activities for memory management –

Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.

In multiprogramming, the OS decides which process will get memory when and how much.

Allocates the memory when a process requests it to do so.

De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management

In multiprogramming environment, the OS decides which process gets the processor when and for how much time. This function is called process scheduling. An Operating System does the following activities for processor management –

Keeps tracks of processor and status of process. The program responsible for this task is known as traffic controller.

Allocates the processor (CPU) to a process.

De-allocates processor when a process is no longer required.

Device Management

An Operating System manages device communication via their respective drivers. It does the following activities for device management –

Keeps tracks of all devices. Program responsible for this task is known as the I/O controller.

Decides which process gets the device when and for how much time.

Allocates the device in the efficient way.

De-allocates devices.

File Management

A file system is normally organized into directories for easy navigation and usage. These directories may contain files and other directions.

An Operating System does the following activities for file management –

Keeps track of information, location, uses, status etc. The collective facilities are often known as file system.

Decides who gets the resources.

Allocates the resources.

De-allocates the resources.

Other Important Activities

Following are some of the important activities that an Operating System performs –

***Security* – By means of password and similar other techniques, it prevents unauthorized access to programs and data.**

***Control over system performance* – Recording delays between request for a service and response from the system.**

Job accounting – Keeping track of time and resources used by various jobs and users.

Error detecting aids – Production of dumps, traces, error messages, and other debugging and error detecting aids.

Coordination between other softwares and users – Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

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

Ans. File Transfer Protocol (FTP):

FTP service enables an internet user to move a file from one computer to another on the internet. A file may contain any type of digital information, text document, image, artwork, movie, sound, software etc. FTP has two basic services

- I. **Downloading**
The process of moving a file from remote computer to one's own computer.
- II. **Uploading**
The process of moving a file from one's own computer to a remote computer.

In FTP service, a file transfer takes place in following manner:

1. A user executes ftp command on his/her local computer, specifying address of the remote computer.
2. An FTP process running on user's computer establishes a connection with an FTP process running on remote computer.
3. The system then asks the user to enter his/her login name and password on the remote computer to ensure that the user possess permission to access the remote computer.
4. After successful login, the user downloads or uploads the desired file(s).

Note that a user needs access rights for a remote computer to transfer files to/from it. With this restriction, it is almost impossible to provide access rights to the large number of users on the internet to a computer that contains sharable information. The concept of anonymous FTP site solves this problem.

3) 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) Explain Metropolitan Area Network (MAN) with a suitable example?

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 fieldbusses 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) 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

