



The University of Lahore
Faculty of Information Technology

Assignment Cover Letter
(Individual Work)

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SAP ID	70082385	Title of Assignment	01
Course Code	CS 11303	Due Date	16/10/2022
Course Name	Operating Systems	Submission Date	12/10/2022
Section	T		

The assignment should meet the below requirements:

- 1- Assignment (hard copy) is required to be submitted on clean paper and soft copy as per lecturer's instructions.
- 2- Soft copy assignment also requires the signed (hardcopy) submission of this form, which automatically validates the softcopy submission.
- 3- The above information is complete and legible.
- 4- Compiles pages are firmly attached.
- 5- Assignment has been copied (softcopy & hardcopy) for each student ahead of the submission.

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I hereby declare that this work represents my own effort, and that all text and code have been written by me and has not been submitted for the use of assessment in another course or class, except where this has been notified and accepted in advance.

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Q1: What are the two main functions of an operating system?

Operating systems have two main functions first one is providing users with a virtual machine and second is managing input and output devices and other system resources.

OR

Operating systems have two main functions providing abstractions to user programs and managing the computers resources. For the most part the interaction between user programs and the operating system deals with the former.

For example, creating, writing, reading and deleting files. The resource management part is largely transparent to the users and done automatically. Thus the interface between user programs and the operating system is primarily about dealing with the abstractions.

Q2: What is multiprogramming?

An operating system that is capable of running multiple programs on a single processor is known as a multiprogramming operating system. When a program has to wait for an input and output transfer in a multiprogramming operating system. Multiprogramming is designed for storing and processing several programs simultaneously not necessarily in real-time.

Example:

On Android, iOS, and other mobile operating systems on the phone, one can listen to music while also sending and receiving text messages.

Q3:

- a) What is spooling?
- b) Do you think that advanced personal computers will have spooling as a standard feature in the future?

- a) Spooling is a process in which data is temporarily held to be used and executed by a device or program. Data is sent to and stored in memory or other volatile storage until the computer requests it for execution.
- b) No, I don't think so that advanced personal computers will have spooling as a standard feature in the future because since now a days job are usually created on the disk.

Q4: On early computers, every bite of data read and write was directly handled by the CPU. What implications does this organization have for multiprogramming?

The main reason for providing direct memory access is to give the CPU flexibility to perform any other task while the input output is being performed by CPU. If there is no direct memory access in the multiprogramming system then the CPU will be fully occupied by the input and output devices, eventually leading no advantage of having a multiprogramming system benefit.

Q5: Why was timesharing not widespread on second generation computers?

Time sharing is the sharing of a computing resource among many users at the same time by means of multiprogramming and multi-tasking. Second generation computers did not have the necessary hardware to protect the operating system from malicious user programs so timesharing not widespread.

Q6: The family of computers idea was introduced in the 1960's with the IBM system/360 mainframes. Is this idea now dead or does it alive on?

The idea of IBM system/360 mainframe is still lives happily on today and every major operating system are having a family of computers.

Q7: List some differences between personal computers operating systems and mainframe operating systems?

Mainframe operating system:

The mainframe operating system is targeted to handle hundreds of users at a time. Means that it's managing hundreds of displays monitors and keyboards and keeps track of the input from each user the process required and requested on these inputs and the output of these inputs. A mainframe operating system is meant to handle a huge number of calculations in a sequential manner.

Personal computer operating system:

On the other hand personal computers operating systems are not truly multiuser. If you create four accounts on Windows XP, then it does not mean that the operating system is multiuser because only a single user can log in and interact with the machine.

Q8: Every nanoseconds one instruction emerges from the pipeline. How many instructions the machine will execute in one second?

Every nanosecond one instruction emerges from the pipeline. This means the machine is executing 1 billion instructions per second. It does not matter at all how many stages the pipeline has. A pipeline with 1 nanosecond per stage would also execute 1 billion instructions per second. All that matters is how often a finished instruction pops out the end of the pipeline.

Q9: How many KB are there in 3-TB?

Terabyte is one billion times larger than a kilobyte, you can multiply 3 terabytes by one billion to get 3 TB converted to KB. Multiplying by one billion is the same as multiplying by 10^9 . We call 10^9 the TB to KB Conversion Factor. Here is the answer with the math showing you how to convert 3 TB to KB by multiplying 3 by the conversion factor of 10^9 .

$$3 * 10^9 = 3000000000 \quad \Rightarrow \quad 3TB = 3000000000KB$$

$$3 * 2^{30} = 3221225472 \quad \Rightarrow \quad 3TB = 3221225472KB$$

References:

- Operating system type (Andrew, 4th.E, p. 51)
- Multiprogramming (Andrew, 4th.E, p. 81)
- Spooling (www.quizlez.com)
- CPU (Use some PHD research paper)
- KB to TB (Use online converter calculator)
- Mainframe (Andrew, 4th.E, p. 69)
- Nanosecond (www.brainly.com)