IT2164/IT2561 Operating Systems

# Tutorial 1

**Introduction to Operating Systems**

Attempt the following questions before you attend tutorial.

1. From the user’s point of view, what role does the operating system play in the overall functioning of the computer?

* The operating system allows the user to interact with the computer system such as creating, delete and copying files; and running programs.
* Computers, phones, video game consoles, Network attached storage (NAS), some televisions, ATM machine, smart watch, needs operating systems.

1. List any 3 components of the system software of a computer system.

* Operating system
* Command line interpreter
* Complier/loader
* Libraries, .Net runtime
* Device/disk management utilities
* Firewall/anit-virus
* ODBC (open database connectivity), ADO etc

Application software

* Adobe
* Etc..

Input

-keyboard

-mouse

Output

-printer

-speaker

-monitor (touch screen)

1. Is it possible for a person to buy a computer and use it without an operating system? Why?

* Not possible. This is because the computer needs the OS in order to be able to execute application programs, which does the actual work the user wants.

Note: iso file – file containing the operating system to download.

1. Identify which of the following are examples of space-multiplexed sharing, and which are time-multiplexed sharing. If there is a sense that it could be either strategy, explain.
   1. The land in a residential zone – space-multiplexed sharing
   2. A personal computer – time-multiplexed sharing (different account can be used but cannot use at the same time)
   3. A whiteboard in a classroom – space-multiplexed sharing (if two people write at the same), time-multiplexed sharing (if you erase and write again on the whiteboard)
   4. A bench seat on a bus – space-multiplexed sharing (a few people can seat at the long bench), time-multiplexed sharing (the people go off and someone else sits there)
   5. A single-user file in the computer – (only one user can use at a time) time-multiplexed sharing
   6. A printer on a timesharing system – (only one user can use the printer at one time) time-multiplexed sharing

* Storage – space-multiplexed sharing
* Memory (RAM(random access memory)) – space-multiplexed sharing (you can run a edge and word doc at the same time)
* CPU – time-multiplexed sharing (only 1 CPU (central processing unit)) (speed of the CPU – kegahertes (billion)(20 kega is 20 billion instructions per sec (3 billion to chrome browser, 5 billion to run word docs, (processed one after another (taking turns) but very fast))))

1. Discuss some factors that must be considered in determining the maximum number of multiprogrammed processes for a particular system. You may assume a batch system with the same number of processes as jobs.

* Amount of memory – more memory means more programs (together with its data) can be loaded into memory.
* The speed of the processor (CPU)– faster processes can satisfy more processes in a unit time.

1. When is batch processing the preferred strategy for work to be done by the computer? When is timesharing the preferred strategy?

* Batch processing – when humans do not need to interact with the program during execution, and when it is important to maximize the utilization of the system resources.
* Timesharing – when users need to interact with the computer at different points in the execution of the program.
* Note: batch processing – resource intensive so timesharing is used

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