TUTORIAL 2

Chapter 1 (Abstractions, OS Functionality)

1. Define abstraction and list examples of abstraction.

2. Why abstraction is needed in computing world?

3. Explain the different levels of abstraction in a computer system.

4. What the functionalities of an Operating System?

5. Give examples and briefly explain the system services provided by an Operating System.

6. What is API? Give examples.

7. Define the terms program, process and thread, and state the relationship between them.

8. Give examples of how threads are used in an application (e.g. a web browser).

9. List all the comparison basis of using Thread compared to using Process to create multiple concurrent tasks.

10. Give the advantages of using Thread over Process.

11. An OS already know enough about an application when it is running at the time of launching. Explain how is this possible.

12. In an OS, even with one CPU, several programs can run at the same time. Explain why is this possible.

13. There are multiple devices from small devices like smartphone to large devices like desktop computers. Are the internal organization of this hardware continuum vastly different? Why?

14. A user action such as moving your mouse from Malaysia to Canada in Google Earth program will result in a series of abstractions. Explain these abstractions in Operating System.

15. Describe what happens in a computer system when a user clicks his mouse in the Google Earth application.

Chapter 2 (OS Structures, SPIN, Exokernel, L3 Microkernel)

1. Explain the SIX characteristics of a good OS structure.

2. Illustrate the following OS structure using a diagram:

    a. DOS-like OS structure.

    b. Monolithic-based OS structure.

    c. Microkernel-based OS structure.

3. What are the advantages & disadvantages for each of the **THREE** OS structures above?

4. Illustrate the relationship between the **THREE** basic OS structures above using a diagram (in terms of 3 characteristics of a good OS structure).

5. State the **TWO** main focus in the original microkernel-based OS design called Mach. Explain what have painted a bad image for Mach microkernel.

6. Briefly explain the **FOUR** techniques taken by SPIN approach to achieve the goal of extensibility.

7. List the **THREE** mechanisms used in SPIN approach to implement logical protection domains.

8. Explain how SPIN implement Logical Protection Domain with a diagram.

9. Explain the **THREE** methods used by Exokernel to implement secure binding.

10. Explain how Exokernel implement secure binding with a diagram.

11. State the **FOUR** minimal abstractions in the L3 microkernel approach.

12. Explain the **FOUR** strikes that are debunked in L3 microkernel approach.

13. Illustrate L3 microkernel structure, and compare the differences with the original microkernel structure.

14. Compare **TWO** main ideas used in the SPIN approach, the Exokernel approach, and the L3 microkernel approach to address the performance issue in the original microkernel structure.