CS2022 ASSIGNMENT 8 (Due Date: Nov 11, 2022)

Instructions: You have to answer all of them.

Question 1

Once a computer user has deleted a file via the operating system, the file content in the harddrive (HD) or solid-state drive (SSD) has been not physically erased and hence the content has not been lost.

(a) State two conditions under which the content of a deleted file in the HD (resp. SSD) will be lost forever.

(b) Once a file has been deleted by the computer user, the operating system will need to update two tables. What are they?

(c) In terms of the memory size and the access time, compare the differences between a harddrive and a solid-state drive.

Question 2

For each computer or cell phone, it must have an operating system. The operating system acts as a interface for the application software to instruct the hardware devices. Generally speaking, the design of an application software is OS-oriented. That is to say, an application software designed for running in one OS is not able to be running in another OS. For example, MS WORD is not able to be running in MacOS.

(a) XFig is a software for drawing diagrams. It is running on top of Linux but not on Windows. If one would like to use XFig in the Windows environment, which software should be installed?

(b) In term of the usage of XFig, there is no significant difference between the use of XFig running in the Linux environment and the use of XFig in the Windows environment. However, in term of the CPU utilization rate there is difference. State, with explanation, which situation demands more utilization of the CPU.

Question 3

(a) State the reasons why the machine codes of an operating system is not hardwired in a ROM device, like BIOS.

(b) For both harddrive and solid-state drive, it could have bad sectors once they have been used for some years. State the possible reasons for the appearing of those bad sectors.

(c) Once a harddrive (resp. SSD) has many bad sectors, it is advised to format the harddrive (resp. SSD). Normally, one would need to disconnect the HD (resp. SSD) from the computer (say computer A) and connect it to another computer (say computer B) as an external HD (resp. SSD). So that, the user of computer B invokes the formatting program to format the HD (resp. SSD). Describe the reasons why it is not possible to format the HD (resp. SSD) simply by running the formatting program in computer A.

(d) Describe the reasons why it is a good practice to partition the HD (resp. SSD) into C-drive and D-drive.

Question 4

(a) Once a computer has been power on, which program is the first program to be running?

(b) Once a computer has been power on, which hardware device is responsible for the execution of the instruction of the first program?

(c) Describe how an operating is able to handle multitasking.

(d) Once a program is running in a computer, the OS will assign a process ID for it. If a program has been invoked twice, the OS will assign two different process IDs for each of them. In which hardware device, the information regarding the process IDs is stored.

(e) If a WORD document has been opened via the Windows OS, the OS will first assign a process ID for the MS WORD process. Memory space for the MS WORD process will be allocated as the working memory space. The file status of the WORD document will be updated. In which hardware device, the information regarding the process ID and the information regarding the file status are stored.