

CS2026 ASSIGNMENT 10 (Due Date: May 22, 2026)

Instructions: You have to answer all of them. Put your answers in a MS WORD file, or other word processing file, and then submit the file to the course Gmail account.

Question 1

- (a) For a file of large memory size, how does the operating system manage to save the file in the memory?
- (b) If a file is deleted, what does the operating system do for this action? Is the content of the file in the memory really erased?
- (c) If a word document file is being read by the MS WORD, can the user delete this file?
- (d) Once the MS WORD have been invoked multiple times for editing multiple word documents, how does Windows manage which document is to appear in which MS WORD user interface?

Question 2

In the lecture, I have introduced two families of operating systems – Windows and MacOS. For the Windows family, Microsoft has developed Windows for desktop and notebook computers; Windows Server for server computers and Windows Mobile for smart phones. For the MacOS family, loosely speaking, Apple has developed MacOS for her desktop and notebook computers, iOS for iPhone, iPadOS for iPad and watchOS for Apple Watch.

- (a) State another major family of operating systems that can be found in today computing devices, such as computer and smart phone.
- (b) Huawei has developed her *Harmony OS* so as to rival the termination of Android support from Google. Which family should it be belongs to?
- (c) State the names of three operating systems which are open-source system software.
- (d) State the names of three operating systems which are not open-source system software.

Question 3

In the lecture, I have introduced two types of software, the application software and system software.

- (a) State the names of four application software that can be found in a desktop or notebook computer.
- (b) State the names of four system software that can be found in a desktop/notebook computer and a smart phone.
- (c) In a computer, which hardware component is running the instructions in an application software?
- (d) In a computer, which hardware component is running the instructions in a system software?
- (e) In a computer, which hardware component is responsible to write data to the RAM?
- (f) In a computer, which hardware component is responsible to write data to the main memory, i.e. the hard disk (HD) or solid state drive (SSD)?
- (g) In a computer, which hardware component is responsible to read signal (equivalently, data) from the keyboard?
- (h) In a computer, which hardware component is responsible to read signal (equivalently, data) from the network card?
- (i) In a computer, which hardware component is responsible to check the statuses of the hardware components? [If any hardware component is not in good condition, the computer will not be started properly.]

Question 4

To manage the read/write of files, an operating system needs to maintain the file allocation table (FAT).

- (a) What is the use of a file allocation table?
- (b) For a large file, how does the operating system manage to save the file if no any memory space has such size?

- (c) Once a file has been deleted, say from the folder `C:\Users\Desktop`, its name will be disappeared in folder `C:\Users\Desktop`. However, this file will appear in the *Trash*. State the reason(s) why Windows provides such function.
- (d) Follow (c), why Windows is able to provide such function without any difficulty?
- (c) Is the data transferred between the USB driver and the computer is in serial mode or parallel mode?
- (d) Does our notebook computer need a device driver for device connecting to the computer via *Type C* connection?
- (e) Once a new printer has been purchased and connected to a computer, do we need to install the corresponding device driver to let the computer user to print a file?

Question 5

With reference to the Figure 7 in the lecture note, it is clear that the operating system acts like a server serving different application systems. Technically, it is called the client-server mode or client-server computing. The operating system is the server while the application systems are clients. It should be noted that the idea of client-server mode is not new. In our society, there are many agents acting as a server serving us. All government agencies (like post office and police department) are acting as a server serving each of us. Besides, a telecommunication firm acts as a server serving the people who have subscribed her services.

- (a) Apart from the operating system in your desktop/notebook computer, state the names of *two servers* that your computer must connect to almost everyday.
- (b) Normally, the maximum number of requests to be put a service queue could be limited. In case the service queue is already full while the operating system in process of a request, how should the operating system handle the additional service requests? [State your thought, any reasonable method to handle such situation.]
- (c) Where should be the contents of the service requests be stored?
- (d) While a service request has been handled by the operating system, where should be result be put?

Question 6

For any external device, like an HP laser printer, a computer needs to have a device driver installed so that the computer is able to communicate with such device.

- (a) Does our notebook computer need a device driver for the USB port to support USB flash memory (equivalently, USB drive)?
- (b) What is the full name of USB?