

New York University Abu Dhabi
CS-UH 3010 - Spring 2021
Homework Assignment 1

Out: February 8th, 2021
Due: February 18th, 2021 at 23:45

Provide succinct answers to the following problems:

1. Is there any difference today between the OS kernel running on a server and its respective version running on desk-/laptops?
2. Consider that a program invoking the call:

```
fscanf(fpointer, "%s %s %d", gender, name, &age);
```


What does exactly happen when the CPU deals with this call? How does such a call get to be serviced by the OS?
3. Why are there two modes of execution in an Operating System? What are they? What do they do?
4. What is multiprogramming and why is it useful and how is it different from time-sharing?
5. Why are timers useful in contemporary computer systems? How do they get to be implemented?
6. Is the following a system program or a system call and why?

```
nread = read(fd1, mybuffer, nb2read);
```


What is the difference between `nread` and `nb2read`? Is this a useful feature and why? Explain.
7. Which of the following instructions and *why* should be privileged?
 - (a) Set value of timer.
 - (b) Read the clock.
 - (c) Clear memory.
 - (d) Turn off interrupts.
 - (e) Switch from user to kernel mode.
 - (f) Access an I/O device.
8. Briefly outline the difference(s) between a *system program* and a *system call*. For your favorite editing system program such as `pico`, `vim`, or `emacs`, explain how and where do system calls manifest while we work with it.

It would be helpful to receive answers that are produced with the help of a text-formatter (for example *LibreOffice*, *OpenOffice* or \LaTeX). Handwritten answers are also welcome provided that they are legible.

What you Need to Do:

1. You will have to create a **pdf** document with all your answers while stating your name and netID at the *very top* of your document.
2. **Submit** your homework typed up in **pdf** file to newclasses.nyu.edu by the deadline. Designate the name of your file-submission to have a meaningful name: this could be `MenaKamel-Section0X-HmwAssg1.pdf` where **X** is the number of the Section you attend (i.e., 1 or 2).