



Assignment 1

This first assignment is due on September 24.

1. This question is a variation of Exercise 1.8 from the textbook. Which of the following machine instructions should be executed in privileged mode? For each explain in a sentence or two (not more please) why or why not.
 - (a) Set the value of the timer.
 - (b) Zero a range of memory addresses.
 - (c) Turn off interrupts.
 - (d) Switch from user mode to kernel mode.
 - (e) Send an instruction to an I/O device.
 - (f) Read the system clock.
 - (g) Issue a trap instruction.
2. The answer to this question is not in the textbook. Unlike the early Intel x86 series, the Motorola 68000 series of processors did have hardware dual-mode operation built into the CPU. That is how early UNIX systems and Apple computers (which used that chip family) were able to run in dual mode. Do current models of the Intel x86 series such as the 386 or later have dual-mode operation? Find the answer online and cite your source. Explain the consequences.
3. Login to a UNIX system and find the `syscalls` manpage. Using the manpage, find and identify one system call in each of the categories below:
 - (a) File management (file creation, deletion, etc.)
 - (b) Process scheduling (e.g., changing priority, creating, deleting processes)
 - (c) I/O (e.g., reading or writing)

For each call, show its syntax, briefly describe, in a few sentences, what it does and what data, if any, is passed to it. Then find, using the Internet or some other source, a corresponding system call in Windows and write its syntax. You do not need to describe what it does.

Submitting the Solution

You must type your assignment. Handwritten assignments will not be accepted. You may, if you wish, submit it electronically instead of handing it in. This will save paper. If you choose to do this, then login to eniac remotely or go to Lab 1000G and login there and follow these instructions:

- The file must be either a plain text file or a PDF document;
- It must be named `hwk1_lastname_firstname` (with a `.pdf` extension if it is a PDF file);
- It must be placed in the directory `/data/yoda/b/student.accounts/cs340/projects/hwk1`;
- It must have permission 0600. If you (still) do not know how to do this, use the command `chmod 0600 filename`.

Do not submit it by hand if you also submit electronically. That is a waste of paper. Fear not; I will be able to read your assignment if you put it online.