Operating Systems **Assignment 2** **Zaid Al-Mashhadani**

Download the attached text file that contains 50,000,000 random words (e.g. Communication, Protocols, and Architecture), and write a serial program (single thread) to read it. After that, the program will copy the words to some form of a list to find:

I. The longest word
II. The shortest word
III. The most common word

Then, improve your program utilizing multiple threads equal to the number of the cores you have on your machine[1]. After reading the words to the same list by a single thread, divide the list evenly between the pool of threads, so that each thread will do the same search concurrently.

Submit the following:

I. Both serial and multithreaded codes with all comments
II. Screenshot of the output for both programs
III. Assignment report which will answer the following questions:
    1. How long the single-thread program takes to perform the tasks?
    2. How many threads your code used in the second version?
    3. How long the multi-threaded program takes to perform the tasks?
    4. What would happen if assign the task of reading these words from the text file to multiple threads, so that each thread will do disk I/O on the same text file? Would that speed up the program?

[1] Mac: sysctl -n hw.ncpu
Linux: grep -c ^processor /proc/cpuinfo
Windows: Ctrl + Shift + ESc