Faculty of Engineering and Applied Science

SOFE 3200U Systems Programming

Background

Many times it is useful to know the execution time of certain operations. Using <time.h>, we are able to obtain the necessary tools to get the time from the computer's hardware. Using the timespec struct, it is possible to obtain up to nanosecond accuracy depending on the hardware's own specifications.

Objectives

The objectives of this experiment are to understand how to compile multiple C files for one program and time how long it takes to run. The concept of being able to use outside dependencies when compiling a program should be understood.

Lab Tasks

Task 0

Download generator.c and generator.h and make sure they are in your working folder before starting.

Task 1

Write a C program to do the following.

1. Using generator.c, utilize its generate() function to write random characters to a text file named Spam.txt.
2. Using <time.h>, time how long it takes for generate() to run.
3. When compiling the program, make sure the generator.c is also attached to the program or else the code won't run.
4. Comment your code and execute.

Task 2

Write a C program to do the following.

1. Open and read the text file you created in Task 1.
2. Count all instances of a certain character inside the file, for example:
    a. ./Program Spam.txt a // This should count all instances of a in Text.txt
        i. aaa // Count of a should be 3
        ii. aba // Count of a should be 2
    b. ./Program Spam.txt h // This should count all instances of h in Text.txt
3. Print to terminal the amount of characters that it counted.
4. Comment your code and execute.

Deliverable

Answer all the questions in the lab report template provided, fill in the title page correctly and submit along with your Makefile and commented code for task 1 and 2.