CSCI 4060U – Laboratory #5
Thread vs. Process Performance in C
Lab Due: <u>Sunday, March 12, 2023 at 11:00pm (Canvas)</u>

Introduction

The main purpose of this lab is to understand the performance difference between creating processes and creating threads in C.

Activity #1

Download the following source file from the course website:

- `CSCI4060U_lab5_fork.c` – an implementation of 100,000 processes

For this file, begin by compiling and running the program and familiarizing yourself with how it works. Next, fully comment the program to include explanations of the following details:

- The purpose of each library included
- The contents of the `do_nothing` function
- The contents of the `main` function including details on each code block

Activity #2

Create a new source file (called `CSCI4060U_lab5_thread.c`) that contains a program that implements the creation of 100,000 threads where all threads join back to the main thread. Each thread should execute a `do_nothing` function as described in Activity #1. Fully comment the program to include explanations of the following details:

- The purpose of each library included
- The contents of the `do_nothing` function
- The contents of the `main` function including details on each code block

Activity #3

Next you should focus your attention on the performance of the two programs from Activities #1 & #2. Specifically, you need to assess how long (in seconds) it takes to create 100,000 threads versus 100,000 processes. Run each program using the `time` command to determine the real time and CPU time. Record these in a comment at the top of each program file.

Marking Scheme

Activity #1:

- Commenting of **CSCI4060U_lab5_fork.c**   2 marks

Activity #2:

- Programming of **CSCI4060U_lab5_thread.c**   4 marks
- Commenting of **CSCI4060U_lab5_thread.c**   2 marks

Activity #3:

- Timing information for both programs   2 marks

TOTAL   10 MARKS

Submission

You should submit your commented *source files* through the lab drop box in Canvas.