CS 340

Assignment 2

Due: 10/30/2020

Changoh Hong

Multithreading is the processing of a process divided into units of performance(threads). There are similarities to multi-tasking. Multitasking performs multiple tasks(process) simultaneously on one PC, and multithreading performs multiple execution flows(threads) simultaneously in one process. Of course, the CPU can handle only one command at a time, so even at the same time, it can handle a certain part of one task, and a certain part of another, and a little bit of the first.. Repeat this process to make it look like multi performing. There are pros and cons of multithreading. One advantage could be maximizing CPU utilization, and one disadvantage could be multithreading is unpredictable and execution order is not assured.

Throughout the this assignment, I understood how the multi threads work like ‘the process initially has one starting thread, thread can create another thread, creation of thread is done by programmer, and every each thread has its own stack, and share the area of data, heap, code.‘ Multithreading is the ability of a central processing unit (CPU) to provide multiple threads of execution concurrently, supported by the OS(operating system). In this project, especially in part2 and part3, I successfully made child threads and its grandchild threads after executing the parent thread. I made multithreads with p thread method using C programming language.

At first, I understood how the p thread works in the C programming language with part1. Part 1 briefly shows how p threads are created, how p threads work, how they terminate. Only one thread was made in part1 but in part2, finally I started making ‘multi threads’ with parent thread and its child threads. Starting of P thread, I brought the #include<pthread.h> library for using p thread method in c programming language. I encountered so much hardship codding this program.

To construct its structure was my first hardship. I was making this p thread program with array at first. Part 2 was fine to make using array method but in part 3, two-dimensional array method was essential, and it was so hard for me to create. I finally finished coding, but I tasted the disastrous result of the odd number of threads creating on and on. Now I think it happens because of race condition which when two commands access the same place at the same time, the results are unpredictable. Although I was frustrated by coding for a long time, I found the solution through a method called ‘structure’. Using Structure, my data can be shared in each thread and even if threads create another thread, they can also share the same data in the ‘struct’. Using this method, I could finish my part3 project. Calculation of number of inputs were another hardship but I figured out like for the child thread, its parent divided by number of child threads are values assign to each child thread. And start, and end points for each child thread is increased by input number divided by number of child threads which I called “increasement”. Calculation of grand child was bit different, but concept was same.

It was fun challenging to create multithreading programming using C language. I learned a lot from this assignment. I learned not only how the multi threads work but also how to code properly and think as programmer. I was so happy to see my output in the text file at the end.