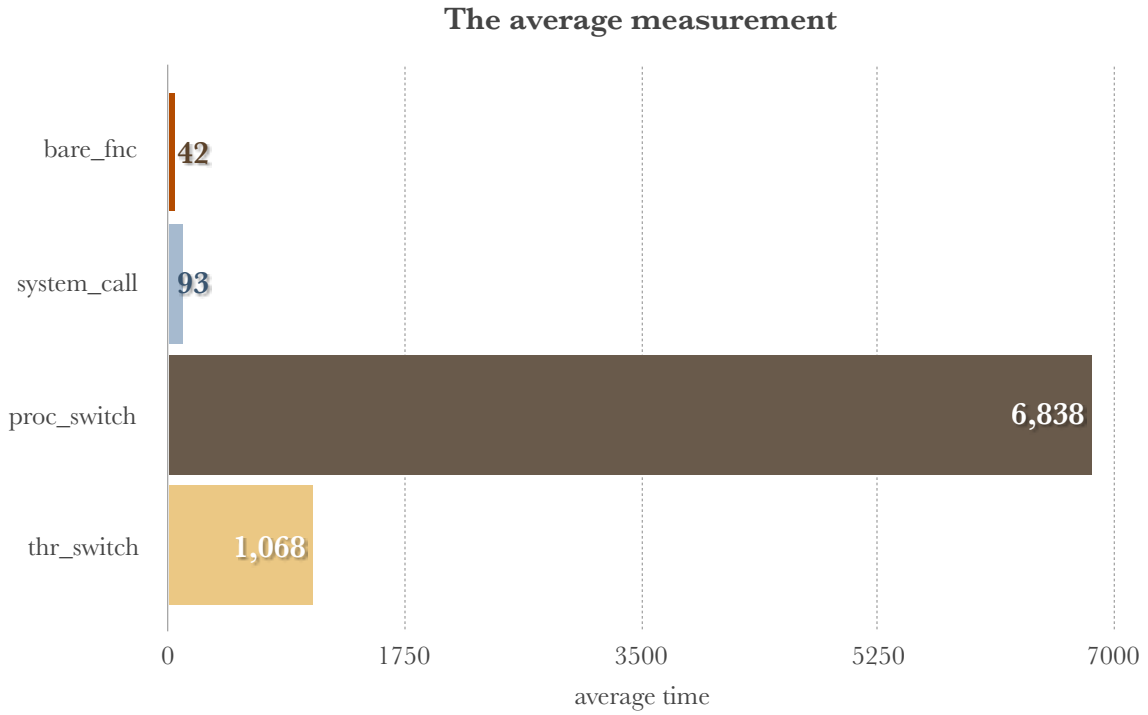
CMPT 300
Weiling Zheng (Lydia)
301294091
weilingz@sfu.ca

Assignment#2 Report

In this assignment, we use a high resolution timer to measure the cost of a bare function, a system call, a process context switch and a thread context switch. In order to get the accurate measurement, I will take the average time by repeating 1000 times of each part.

Here is the bar chart after running 1000 times:



The use of resolution timer in each function:

bare function	**CLOCK_MONOTONIC**
system call — getpid()	**CLOCK_MONOTONIC**
the process switch	**CLOCK_PROCESS_CPUTIME_ID**
the thread switch	**CLOCK_THREAD_CPUTIME_ID**

The use of system core in each function:

bare function	**multicore**
system call — getpid()	**multicore**
the process switch	**multicore —> singlecore**
the thread switch	**multicore —> singlecore**

The measurement strategy in each function:

- In bare function measurement, the measured function is empty without any content in it. The reason why I use CLOCK_MONOTONIC is that it represents absolute elapsed wall-lock time and since the runtime of bare function is very short it will have the higher priority in ready queue.
- In system call measurement, we calculate the time of getpid() system call. The reason for using CLOCK_MONOTONIC is the same to the bare function.

☑Why the measuring time of system call is higher than function call?

I think it is because the the function call is in user level and the system call will come into kernel level.

☑Why I did not delete the clock_gettine() system function in the bare function and the getpid() system call?

I think the time of bare function and system call is very short so that if we delete it, the program may have the overflow.

- In process switch measurement, we calculate the time between the main process and the child process by creating two pipes to exchange a singe-byte message. After I measured the process switch time, I delete the time of clock_gettime() system call and *for loop* function call in order to get the accurate time. (I put the *for loop* between the clock_gettime() function so that I need to delete the time of it)
- In thread switch measurement, we calculate the time between two pipes using a shared integer number. After I measured the thread switch time, I delete the time of clock_getting() system call and the *if loop* function call in oder to get the accurate time. (I put the *if loop* between the clock_gettime() function so that I need to delete the time of it)

☑ Why the measurement of process switch is much higher than the thread switch? I think it is because the thread switch is in one process, the time will be much more cheaper than the switch between two processes.