CSE 312 OPERATING SYSTEMS

HOMEWORK 2 REPORT

PART 1

In main thread, I printed the unsorted list at first, then created all the other four threads, then waited all of them sequentially with join syscall, then merged both halves of the list, then merged the list itself; after all, I wrote the sorted list and exited the program.

All to say about four other threads, I sorted the each quarter of the list in each of the threads.

PART 2

In main thread, I created the first two threads and waited for them, then I created the last two one and waited for them, and printed the results and exited the program.

In producer/consumer threads, I increased/decreased the value in shared memory constant times and exited the thread.

In mutexed producer/consumer threads, I increased/decreased the value in shared memory constant times, with locking/unlocking the mutex and exited the thread.

SYSCALL

In create syscall, I created the thread, set all the the values (registers, program counter, etc.) of the given thread and set its state as ready.

In join syscall, I returned the state of the given thread with parameter.

In exit syscall, I exited from the current thread, by switching its state.

In mutex lock/unlock syscall I implemented Peterson’s algorithm.

In case of timer interrupt occurs, I switched the thread and all of its contents due to the Round Robin scheduling algorithm. I used a circular array to iterate all the threads with FIFO order. At each timer interrupt, I iterated to the next ready thread, and switched the contents of all the registers, program counter with the contents of the picked thread. I also put the last contents of the switched thread to the thread table.