

CS 341 Operating Systems

Programming Assignment 1: Real-Time Event Scheduler

The various operators used in these program are:

1. Threads
2. Semaphores
3. Mutex
4. Min Heap
5. String functions

The program consists of three threads:

1. Reader Thread
2. Worker Thread
3. Clock Thread

Functions of Reader Thread:

- The reader thread reads the input from the user. It adds the timestamp and the activity from the user as a request in the Min Heap.
- It performs various functions while reading the input from user. It has check if the timestamp which we are trying to enter is correct or if the user entering the value is of past.
- When the user enters correct timestamp and activity, It initialize the timer.

Functions of Worker Thread:

- The worker threads get initialized when the timer gets the signal and the event is supposed to happen. When the event happens the worker thread starts operating and gives the signal and then check if there are any more requests and then performs them again.
- The worker thread stops after getting the signal.

Functions of Clock Thread:

- The clock thead act as a real time clock. It runs while the activities are going on by the other thread.
- The clock is an important thread in this because the timer threads get initialized because of the clock.

Thread synchronization:

- The order of the threads are like this: At the start all the threads get initialized and runs depending on each thread. The worker thread gets stop as soon as it starts. This is because it waits for the signal to activate it.
- The threads Reader and Clock keeps running.
- The Clock thread especially has no influence of the other thread.
- The reader thread has to get inputs from the user and thus waits for the user to enter the value.
- The thread synchronization is very important in this for all the activities to work at the same time.

Program design:

1. All operations are initialized
2. Threads get started
3. User has to input the requests.
4. Timer starts
5. Worker threads starts again.
6. Reader thread at the same time ask for other requests
7. If no activities the user wants to do then program ends