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In this alternate Project3, I’m succeeded in implementing the Enter and Leave function using the mutex and cond synchronization mechanism. The invariant is that whenever thread doesn’t hold the monitor lock, the state of bathroom is either vacant or occupied by either male or female. However as I’m not very clear about how to use the master thread to spawn a number of threads, I failed to implement the multi-threaded test program. This submission is my first version of this project. I will submit later a more complete version.

Fab.04.2013 Monday

Today I have finished this project. It runs correctly by printing out all the individual thread information without conflict with each other. When implementing the control module, I have my invariant to be the current state of bathroom. It is constant when mutex is not locked. When the mutex is not locked, the state of bathroom should either be woman, man or vacant, and the state may changes from vacant to either man or woman based on the gender of individual currently trying to enter the bathroom. However, if one tries to waiting in an occupied bathroom, it checks if the bathroom is used by the same gender and increment the number of users, or if the bathroom is used by the opposite gender, the thread is going to wait on the condition variable “occupied”. While one leaves the bathroom, the control module checks if it is the last person in the bathroom and change the state to vacant and broadcast on the condition variable to restart all the waiting thread, or if there are still people in the bathroom, it simply decrement the number of users. All the information is printing while individual leaves the bathroom after several iterations as indicated by the loop count, to avoid potential conflicts and exit safely. One can safely run the program with the same format indicated on the homework “./bathroomSim nUsers meanArrival meanStay meanLoopCount”, all the number is interpreted as microsecond.

Type: make all to build the executable files

Make clean to remove the files