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CISC 3320

Homework 3

Design Document

Main:

- Description: Allocates the PID manager and creates 50 threads to call the void job(PidManager, int) function.

Job:

- Description: Requests a pid from the pid manager then the function echo's the pid and the thread id and goes to sleep. After sleeping for a random time it releases the pid.
- Parameters: pids - PidManager, mu - reference to mutex lock, sleepTime - double representing the desired sleep time.
- Function: to complete the required task for each thread.

Class PidManager:

- Description: A wrapper for the dynamic_bitset data structure. Incharge of distributing and releasing pids.
- PidManager(int, int)
    - Description: Constructs the PidManager class with a min size and a max size as passed in by the parameters. Allocates the dynamic bitset object and sets all the values to default true value.
    - Parameters: minSize - integer representing the minimum size of the bitset, maxSize - integer representing the maximum size of the bitset
    - Function: to create the PidManager object

- int allocate_pid(void):
    - Description: checks if there are any pids available, if so sets the pid to false to mark it as active. Then returns the pid + minSize. If there are no pids it returns -1.
    - Function: to distribute a pid from the bitset.
- Void release_pid(int pid):
    - Description: sets the pid to true to represent it being available.
    - Parameters: pid - integer representing pid to be released
    - Function: to release the pid.