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CSEN 602 Operating Systems, Spring 2020
Project description - Milestone 1
Multi-Programming Batch system
Due on Friday 28/2/2020 by 11:59 pm

1 Multi-programming Batch Systems

Batch processing is a technique in which an Operating System collects similar jobs together in a batch and then starts executing the batches sequentially, one job at a time. In a multi-programmed batch system, the CPU will never be idle. The Operating System keeps multiple jobs in the main memory, these are the jobs waiting to be executed. The Operating System will choose one of these jobs and begins execution. Once this job needs an I/O operation, the Operating System switches to another job. If several jobs are ready to run at the same time, then the Operating System chooses which one to run through the process of CPU Scheduling.

Project Objective: The best way for you to understand the concepts of an Operating System is to build an operating system and then to experiment with it. Your OS will be a SIMULATION only. In this project, you are asked to build a simulation of a multi-programming batch system using **JAVA**.

2 Milestone1

2.1 System Calls

A system call is the programmatic way in which a process requests a service from the kernel of the operating system it is executed on. You are required to implement system calls of your simulated OS using the built-in functions of Java.

Types of system calls required:

1. Read the data of any file from the disk.
2. Write text input to a file in the disk.
3. Print data on the screen.
4. Take text input from the user.

2.2 Processes

Our simulated OS can create different processes and switch between them in the memory. In order to switch between processes, the OS must have information about each process such as its state (running, ready ,etc..), and ID. The Operating system chooses one process between all active processes to run first. Therefore, the OS needs to keep track of all the created processes.

We have 5 main processes:

Process 1:
It should take input from the user: a filename. Then print the content of this file on the screen.

Process 2:
It should take two inputs from the user: a filename, and some data. Then write the data to the file.

Process 3:
It should count and display to the user the numbers from 0 to 300.

Process 4:
It should count and display to the user the numbers from 500 to 1000.

Process 5:
It should take two inputs from the user: a lower number and a larger number. Then count from the lower number to the upper number and write the count to a new file.

2.3 Output

For this Milestone, your Simulated OS should be able to create and run the 4 processes mentioned above.
Note: You will need to use Threads in Java to be able to run 5 processes in parallel.

2.4 Work Distribution

During the evaluation, each team member will be evaluated on the component that they worked on. **However**, the whole team grade will still be affected by any missing part. Each team member must pick and work on one of the three following components:

1. System call 1 & Process 1
2. System call 2 & Processes 2, 5
3. System call 3, 4 & Processes 3, 4

Project Deliverable and Submission
The project should be submitted as ONE zip folder containing java files you created. Late submissions will not be accepted.

Have fun :)