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Computer Simulation

Project Winter 2023

In this project, we use Jupyter notebook to simulate CPU scheduling. This system has two layers at the first layer there is a priority queue and in the second layer there are three queues with different policies.
We implement functions as mentioned in the document.
Check comments and documents for more information.

Cells description in order:

1. Set the required inputs
2. Set the values
3. Imports and requirements
4. Task and CpuScheduler class
   - Task class:
     Data class for holding task related values
   - CpuScheduler class:
     This is our cpu scheduler. It's handling every queues and tasks that are add, remove and etc to them with different policy and pass them to different layers
5. job_creator to create tasks and set tasks values with defined methodes
6. Print the required outputs

Run project:
Open jupyter notebook with googlecolab or vs code then run all cells.
For improving the model and reducing the waiting time, we should choose T1 and T2 such that each small task can be completed in T1 and each medium task can be completed in T2+T1. Every other large tasks should be moved to the last FCFS queue. So T1 and T2 should be chosen with tasks distribution in mind. Generally T1 is less than T2.

1. sample
   - inputs:
     X = 2
     Y = 5
     Z = 50
     T = 1000
     N = 100

- outputs:

  Average priority queue length: 6.452477209872036
  Average round robin 1 queue length: 2.9469891883869295
  Average round robin 2 queue length: 0.5292960333049479
  Average fcfs queue length: 0.00015546045308983985
  Average all queues length: 9.928917892017004
  Average priority queue waiting time: 0.81
  Average round robin 1 queue waiting time: 0.79
  Average round robin 2 queue waiting time: 0.2
  Average fcfs queue waiting time: 0.01
  Average all queues waiting time: 1.81
  CPU utilization: 20.9%
  Percentage of timed out tasks: 28.999999999999996%