Project 3 Report – A Batch Scheduling System

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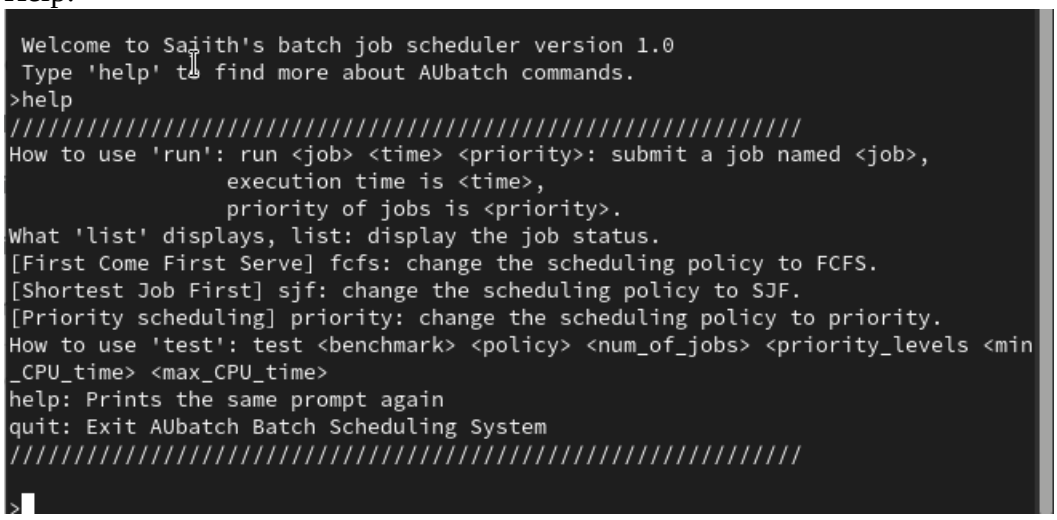
Steps to run the program: -
In your centos terminal, type the makefile command(The make fill create all executable files) run "make -f makerfile.txt"

Execute the program by./aubatch

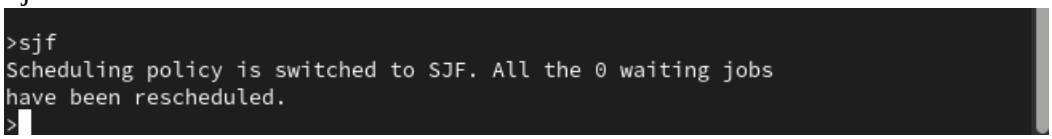
The output is as follows : -

1) Help:

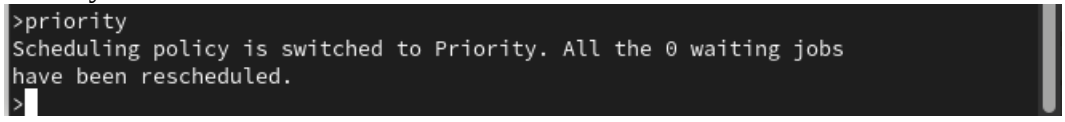


2) Run: -

3) Sjf: -



4) Priority: -



5) Fcfs: -

```
>fcfs
Scheduling policy is switched to FCFS. All the 0 waiting jobs
have been rescheduled.
>
```

Note: - if the scheduling policy is set and if we type the same command again, the prompt returns nothing. It only returns if the policy is changed.

6) List: -

```
>list

Total Number of jobs in the queue: 2
Scheduling Policy: FCFS.
Name    CPU_Time        Priority        Progress
a       5               10              RUN
b       45              20
c       3               20
```

7) Quit: -

```
>quit
Total number of jobs submitted: 4
Average turnaround time:33.00 seconds
Average CPU time:15.50 seconds
Average waiting time:17.50 seconds
Throughput:0.06 No./second
[centos@localhost ~]$
```

System Design: -

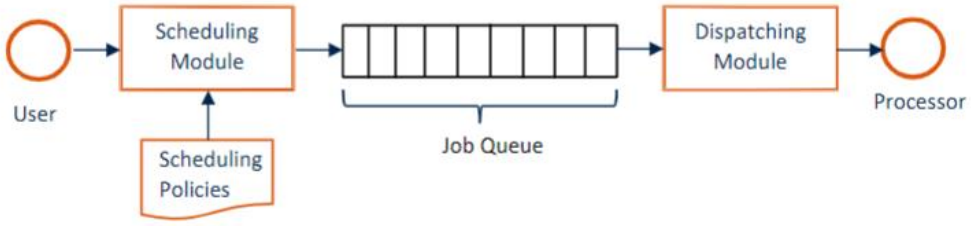
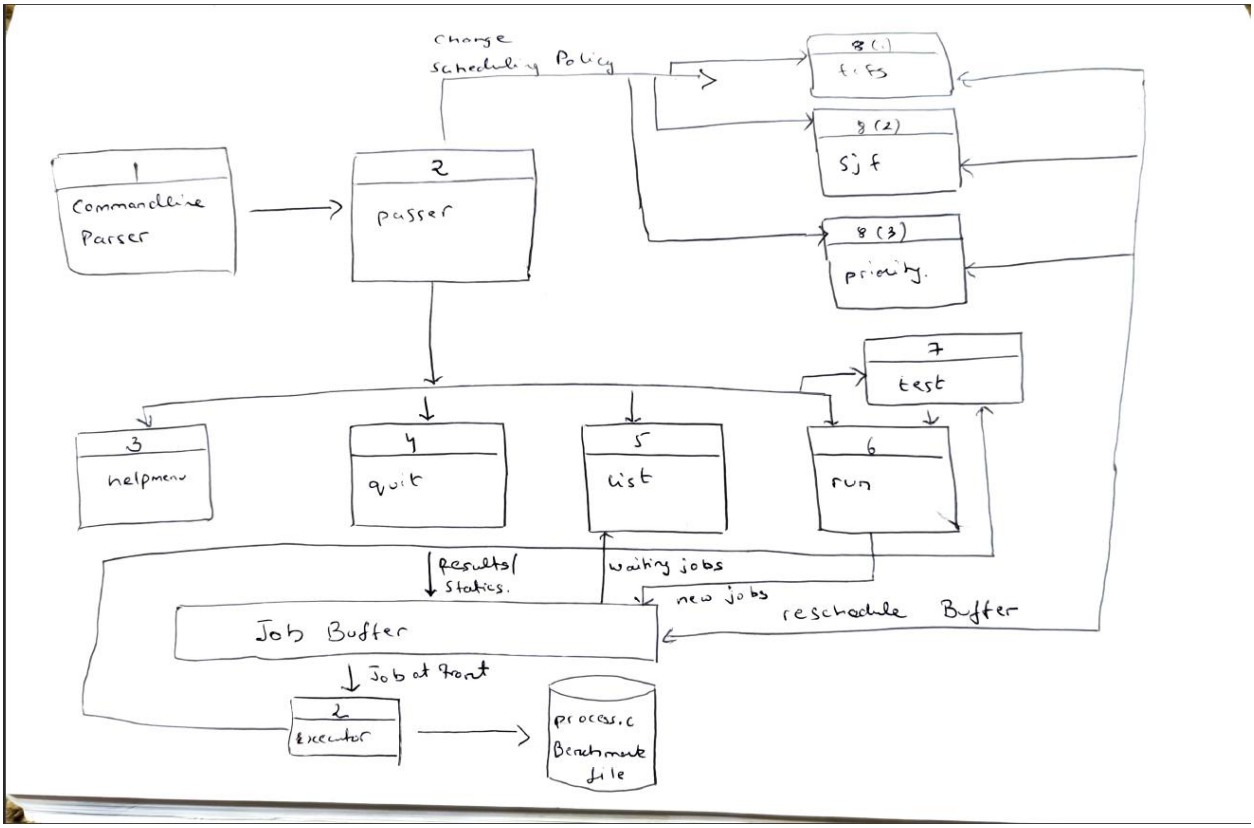


Fig. 1 The system architecture of the AUbatch scheduler

Dataflow diagram: -



Performance Metrics: -

Calculated turnaround time, CPU time, waiting time
Passed 6 jobs in different scheduling algorithms.

Priority Scheduling: -

```
>test testpriority priority 6 8 14 20
Total number of jobs submitted: 18
Average turnaround time: 53.17 seconds
Average CPU time: 16.28 seconds
Average waiting time: 36.89 seconds
Throughput:     0.06 No./second
```

Shortest Job First: -

```
>test testsjf sjf 6 8 14 20
Total number of jobs submitted: 12
Average turnaround time: 50.00 seconds
Average CPU time: 15.42 seconds
Average waiting time: 34.58 seconds
Throughput:     0.06 No./second
```

First Come First Serve: -

```
>test testfcfs fcfs 6 8 14 20
Total number of jobs submitted: 6
Average turnaround time: 63.17 seconds
Average CPU time: 18.00 seconds
Average waiting time: 45.17 seconds
Throughput:     0.06 No./second
```

Performance Evaluation: -

The waiting time of FCFS is higher than the other two, which makes the performance of FCFS the worst of the three. SJF had the quickest turnaround time and best performance followed by priority scheduling policy but priority being randomly assigned to each job, FCFS could have performed better. Arrival rate, number of jobs and processing time for each job are factors that determine the throughput(jobs/sec).

Lessons learnt: -

The project gives a clear picture on how scheduling algorithms function in coding or practically, where factors like PC performance effect in values from theoretical values. Also, this project taught me how to use pthread conditions to reduce system latency. Synchronization shows how it increases the performance of the system. Makefile makes it easier to execute bunch of files together and gives an order for execution of files.

(Note: - we can remove all executable files after running the application by make -f makerfile.txt clean)