Constraint:

- To compile and run the code you “must install make in linux”
  - Command to install make: `sudo apt-get install build-essential`
- The files should be name properly as the requirement:
  - FCFS must be name: **schedule_fcfs.c**
  - SJF must be name: **schedule_sjf.c**
  - Priority must be name: **schedule_priority.c**
  - Round Robbin must be name: **schedule_rr.c**
  - Priority_RR must be name: **schedule_priority_rr.c**
- Must have: `#include "schedulers.h"` **in all above *.c file**
  - **Example:**

```
#include <stdlib.h>
#include <stdio.h>
#include <string.h>
#include "schedulers.h"
#include "list.h"
#include "cpu.h"
```

- The function **add()** and **schedule()** must be in all *.c file
  - The reason is this project is run and compiled the file based on Makefile. It automatically generates executable files for us.

Online Test All File:

- Linux Command Online Test All File. The output of FCFS, SJF, Priority, RR, Priority_RR will be printed out at “output.txt”. We need to include this file to turn in as requirement.

- Command:

make clean; make fcfs; echo -e FCFS > output.txt; ./fcfs schedule.txt >> output.txt; echo -e >> output.txt; make clean; make sjf; echo -e SJF >> output.txt; ./sjf schedule.txt >> output.txt; echo -e >> output.txt; make clean; make priority; echo -e Priority >> output.txt; ./priority schedule.txt >> output.txt; echo -e >> output.txt; make clean; make rr; echo -e RR >> output.txt; ./rr schedule.txt >> output.txt; echo -e >> output.txt; make clean; make priority_rr; echo -e Priority_RR >> output.txt; ./priority_rr schedule.txt >> output.txt; echo -e >> output.txt

Table

Task	Priority	Burst Time
T1	4	20
T2	3	25
T3	3	25
T4	5	15
T5	5	20
T6	1	10
T7	3	30
T8	10	25

First Come First Serve

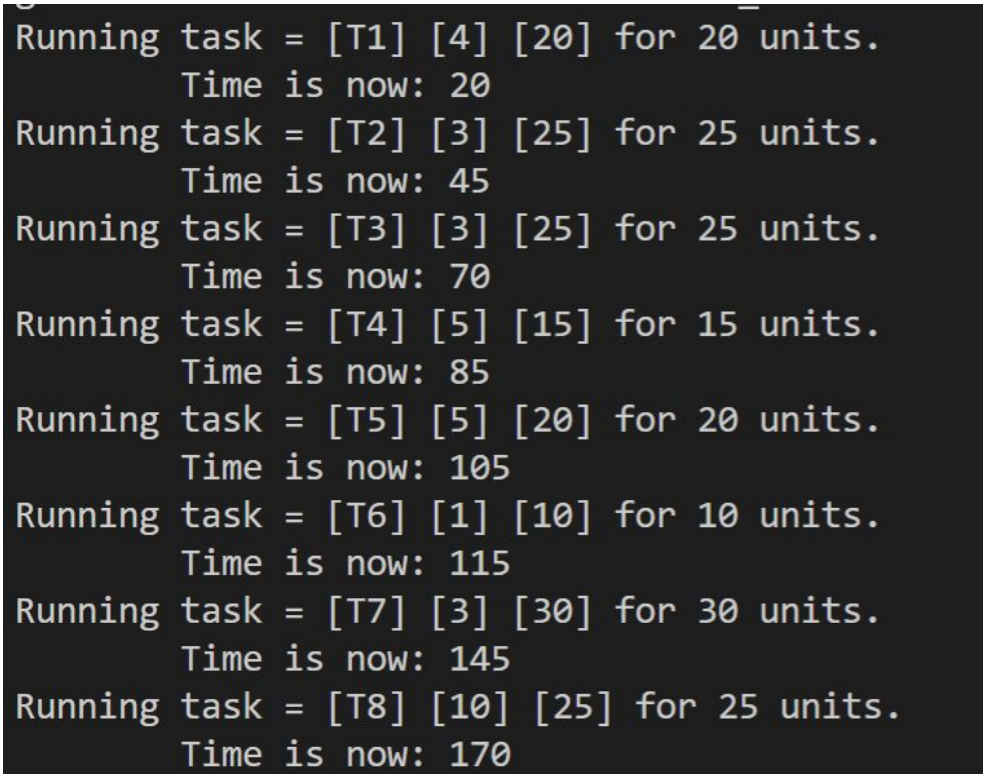
Linux Command build and run:

- Shell Display Command: **make clean ; make fcfs ; ./fcfs schedule.txt**
- Redirect to txt file: **make clean ; make fcfs ; ./fcfs schedule.txt >> output.txt**
- Or: **make clean; make fcfs; echo -e FCFS >> output.txt; ./fcfs schedule.txt >> output.txt; echo -e >> output.txt**

Visualization:

T1		T2	T3	T4	T5	T6	T7	T8
0	20	45	70	85	105	115	145	170

Implementation Result:



Shortest Job First

Linux Command build and run:

- Shell Display Command: **make clean ; make sjf ; ./sjf schedule.txt**
- Redirect to txt: **make clean ; make sjf ; ./sjf schedule.txt >> output.txt**
- Or: **make clean; make sjf; echo -e SJF >> output.txt; ./sjf schedule.txt >> output.txt; echo -e >> output.txt**

Visualization Grant Chart:

T6		T4	T1	T5	T2	T3	T8	T7
0	10	25	45	65	90	115	140	170

Implementation Result:

```
Running task = [T6] [1] [10] for 10 units.
        Time is now: 10
Running task = [T4] [5] [15] for 15 units.
        Time is now: 25
Running task = [T1] [4] [20] for 20 units.
        Time is now: 45
Running task = [T5] [5] [20] for 20 units.
        Time is now: 65
Running task = [T2] [3] [25] for 25 units.
        Time is now: 90
Running task = [T3] [3] [25] for 25 units.
        Time is now: 115
Running task = [T8] [10] [25] for 25 units.
        Time is now: 140
Running task = [T7] [3] [30] for 30 units.
        Time is now: 170
```

Priority

Linux Command build and run:

- Shell Display Command: **make clean ; make priority ; ./priority schedule.txt**
- Redirect to txt: **make clean ; make priority; ./priority schedule.txt >> output.txt**
- Or: **make clean; make priority; echo -e Priority >> output.txt; ./priority schedule.txt >> output.txt; echo -e >> output.txt**

Visualization Grant Chart:

T8	T4	T5	T1	T2	T3	T7	T6
0 25	40	60	80	105	130	160	170

Implementation Result:

```
Running task = [T8] [10] [25] for 25 units.
        Time is now: 25
Running task = [T4] [5] [15] for 15 units.
        Time is now: 40
Running task = [T5] [5] [20] for 20 units.
        Time is now: 60
Running task = [T1] [4] [20] for 20 units.
        Time is now: 80
Running task = [T2] [3] [25] for 25 units.
        Time is now: 105
Running task = [T3] [3] [25] for 25 units.
        Time is now: 130
Running task = [T7] [3] [30] for 30 units.
        Time is now: 160
Running task = [T6] [1] [10] for 10 units.
        Time is now: 170
```

Round Robbin

Linux Command build and run:

- Normal Command: **make clean ; make rr ; ./rr schedule.txt**
- Redirect to txt: **make clean ; make rr ; ./rr schedule.txt >> output.txt**
- Or: **make clean; make rr; echo -e RR >> output.txt; ./rr schedule.txt >> output.txt; echo -e >> output.txt**

Visualization Grant Chart:

T1	T2	T3	T4	T5	T6	T7	T8	T1	T2	T3	T4	T5	T7	T8	T2	T3	T7	T8
0 10	20	30	40	50	60	70	80	90	100	110	115	123	135	145	150	155	165	170

Implementation Result:

```
Running task = [T1] [4] [20] for 10 units.
        Time is now: 10
Running task = [T2] [3] [25] for 10 units.
        Time is now: 20
Running task = [T3] [3] [25] for 10 units.
        Time is now: 30
Running task = [T4] [5] [15] for 10 units.
        Time is now: 40
Running task = [T5] [5] [20] for 10 units.
        Time is now: 50
Running task = [T6] [1] [10] for 10 units.
        Time is now: 60
Running task = [T7] [3] [30] for 10 units.
        Time is now: 70
Running task = [T8] [10] [25] for 10 units.
        Time is now: 80
Running task = [T1] [4] [10] for 10 units.
        Time is now: 90
Running task = [T2] [3] [15] for 10 units.
        Time is now: 100
Running task = [T3] [3] [15] for 10 units.
        Time is now: 110
Running task = [T4] [5] [5] for 5 units.
        Time is now: 115
Running task = [T5] [5] [10] for 10 units.
        Time is now: 125
Running task = [T7] [3] [20] for 10 units.
        Time is now: 135
Running task = [T8] [10] [15] for 10 units.
        Time is now: 145
Running task = [T2] [3] [5] for 5 units.
        Time is now: 150
Running task = [T3] [3] [5] for 5 units.
        Time is now: 155
Running task = [T7] [3] [10] for 10 units.
        Time is now: 165
Running task = [T8] [10] [5] for 5 units.
        Time is now: 170
```

Priority Round Robbin

Linux Command build and run:

- Normal Command: **make priority_rr ; ./priority_rr schedule.txt**
- Redirect to txt: **make priority_rr ; ./priority_rr schedule.txt >> output.txt**
- Or: **make clean; make priority_rr; echo -e Priority_RR >> output.txt; ./priority_rr schedule.txt >> output.txt; echo -e >> output.txt**

Visualization Grant Chart:

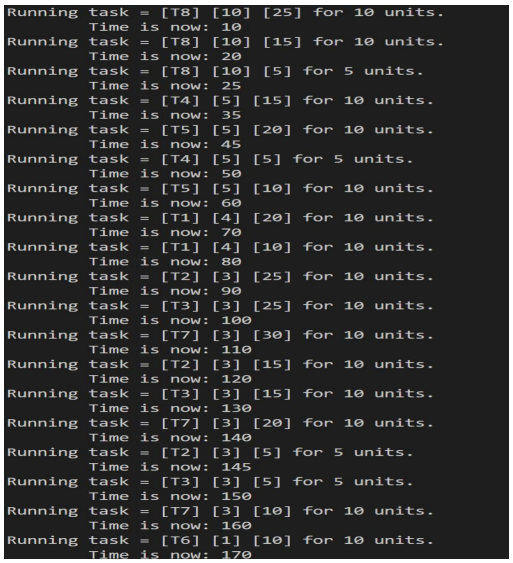
T1, 4, 20
T2, 3, 25
T3, 3, 25
T4, 5, 15
T5, 5, 20
T6, 1, 10
T7, 3, 30
T8, 10, 25

T8	T8	T8	T4	T5	T4	T5	T1	T1	T2	T3	T7	T2	T3	T7	T2	T3	T7	T6
0 10	20	25	35	45	50	60	70	80	90	100	110	120	130	140	145	150	160	170

Same Priority -> Switch:

- T4, T5
- T2, T3, T7

Implementation Result:



Full Output Table:

FCFS:

```
Running task = [T1] [4] [20] for 20 units.
        Time is now: 20
Running task = [T2] [3] [25] for 25 units.
        Time is now: 45
Running task = [T3] [3] [25] for 25 units.
        Time is now: 70
Running task = [T4] [5] [15] for 15 units.
        Time is now: 85
Running task = [T5] [5] [20] for 20 units.
        Time is now: 105
Running task = [T6] [1] [10] for 10 units.
        Time is now: 115
Running task = [T7] [3] [30] for 30 units.
        Time is now: 145
Running task = [T8] [10] [25] for 25 units.
        Time is now: 170
```

SJF:

```
Running task = [T6] [1] [10] for 10 units.
        Time is now: 10
Running task = [T4] [5] [15] for 15 units.
        Time is now: 25
Running task = [T1] [4] [20] for 20 units.
        Time is now: 45
Running task = [T5] [5] [20] for 20 units.
        Time is now: 65
Running task = [T2] [3] [25] for 25 units.
        Time is now: 90
Running task = [T3] [3] [25] for 25 units.
        Time is now: 115
Running task = [T8] [10] [25] for 25 units.
        Time is now: 140
Running task = [T7] [3] [30] for 30 units.
        Time is now: 170
```

Priority:

Running task = [T8] [10] [25] for 25 units.
Time is now: 25
Running task = [T4] [5] [15] for 15 units.
Time is now: 40
Running task = [T5] [5] [20] for 20 units.
Time is now: 60
Running task = [T1] [4] [20] for 20 units.
Time is now: 80
Running task = [T2] [3] [25] for 25 units.
Time is now: 105
Running task = [T3] [3] [25] for 25 units.
Time is now: 130
Running task = [T7] [3] [30] for 30 units.
Time is now: 160
Running task = [T6] [1] [10] for 10 units.
Time is now: 170

RR:

Running task = [T1] [4] [20] for 10 units.
Time is now: 10
Running task = [T2] [3] [25] for 10 units.
Time is now: 20
Running task = [T3] [3] [25] for 10 units.
Time is now: 30
Running task = [T4] [5] [15] for 10 units.
Time is now: 40
Running task = [T5] [5] [20] for 10 units.
Time is now: 50
Running task = [T6] [1] [10] for 10 units.
Time is now: 60
Running task = [T7] [3] [30] for 10 units.
Time is now: 70
Running task = [T8] [10] [25] for 10 units.
Time is now: 80
Running task = [T1] [4] [10] for 10 units.
Time is now: 90
Running task = [T2] [3] [15] for 10 units.
Time is now: 100
Running task = [T3] [3] [15] for 10 units.
Time is now: 110
Running task = [T4] [5] [5] for 5 units.
Time is now: 115
Running task = [T5] [5] [10] for 10 units.
Time is now: 125
Running task = [T7] [3] [20] for 10 units.
Time is now: 135
Running task = [T8] [10] [15] for 10 units.
Time is now: 145
Running task = [T2] [3] [5] for 5 units.
Time is now: 150
Running task = [T3] [3] [5] for 5 units.
Time is now: 155
Running task = [T7] [3] [10] for 10 units.
Time is now: 165
Running task = [T8] [10] [5] for 5 units.
Time is now: 170

Priority_RR

Running task = [T8] [10] [25] for 10 units.
Time is now: 10
Running task = [T8] [10] [15] for 10 units.
Time is now: 20
Running task = [T8] [10] [5] for 5 units.
Time is now: 25
Running task = [T4] [5] [15] for 10 units.
Time is now: 35
Running task = [T5] [5] [20] for 10 units.
Time is now: 45
Running task = [T4] [5] [5] for 5 units.
Time is now: 50
Running task = [T5] [5] [10] for 10 units.
Time is now: 60
Running task = [T1] [4] [20] for 10 units.
Time is now: 70
Running task = [T1] [4] [10] for 10 units.
Time is now: 80
Running task = [T2] [3] [25] for 10 units.
Time is now: 90
Running task = [T3] [3] [25] for 10 units.
Time is now: 100
Running task = [T7] [3] [30] for 10 units.
Time is now: 110
Running task = [T2] [3] [15] for 10 units.
Time is now: 120
Running task = [T3] [3] [15] for 10 units.
Time is now: 130
Running task = [T7] [3] [20] for 10 units.
Time is now: 140
Running task = [T2] [3] [5] for 5 units.
Time is now: 145
Running task = [T3] [3] [5] for 5 units.
Time is now: 150
Running task = [T7] [3] [10] for 10 units.
Time is now: 160
Running task = [T6] [1] [10] for 10 units.
Time is now: 170