

# OS HW2 Programming projects

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分工:  $\frac{1}{3}$  for each

## Environment

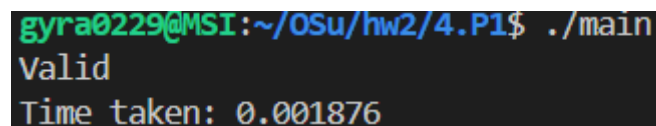
- OS: Ubuntu 22.04
- Kernel: Linux 5.15.153.1-microsoft-standard-WSL2
- Compiler: gcc 11.4.0

## Ch4 project 1

Commands

```
cd 4.P1
gcc main.c -pthread -o main
./main
```

Result image



```
gyra0229@MSI:~/OSu/hw2/4.P1$ ./main
Valid
Time taken: 0.001876
```

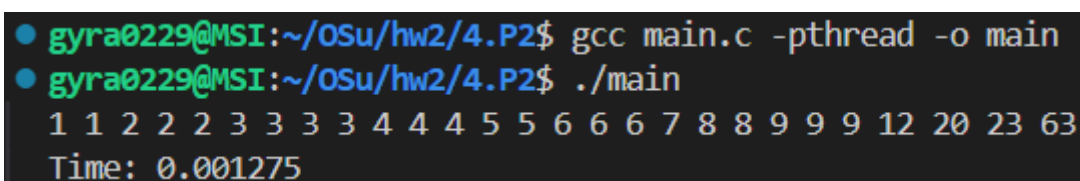
Figure 1: The result for ./main in 4.P1

## Ch4 project 2

Commands

```
cd 4.P2
gcc main.c -pthread -o main
./main
```

Result image



```
● gyra0229@MSI:~/OSu/hw2/4.P2$ gcc main.c -pthread -o main
● gyra0229@MSI:~/OSu/hw2/4.P2$ ./main
1 1 2 2 2 3 3 3 3 4 4 4 5 5 6 6 6 7 8 8 9 9 9 12 20 23 63
Time: 0.001275
```

Figure 2: The result for ./main in 4.P2

## Ch5 project 1

Commands

```
cd 5.P1
make fcfs
./fcfs schedule.txt
make sjf
./sjf schedule.txt
make priority
```

```
./priority schedule.txt
make round_robin
./round_robin schedule.txt
make priority_rr
./priority_rr schedule.txt
```

Result images

```
gyra0229@MSI:~/OSu/hw2/5.P1$ make fcfs
gcc -Wall -Iinclude -g -DFCFS CPU.c driver.c -o fcfs
gyra0229@MSI:~/OSu/hw2/5.P1$ ./fcfs schedule.txt
Running task = [name: T1, priority: 4, burst: 20, tid: 1]
Task T1 ran for 20 units. Remaining burst = 0 units.
Task T1 finished.
Running task = [name: T2, priority: 2, burst: 25, tid: 2]
Task T2 ran for 25 units. Remaining burst = 0 units.
Task T2 finished.
Running task = [name: T3, priority: 3, burst: 25, tid: 3]
Task T3 ran for 25 units. Remaining burst = 0 units.
Task T3 finished.
Running task = [name: T4, priority: 3, burst: 15, tid: 4]
Task T4 ran for 15 units. Remaining burst = 0 units.
Task T4 finished.
Running task = [name: T5, priority: 10, burst: 10, tid: 5]
Task T5 ran for 10 units. Remaining burst = 0 units.
Task T5 finished.
All tasks done 🐱
Average turnaround time = 63.00
Average waiting time = 44.00
Average response time = 44.00
```

Figure 3: The result for ./fcfs schedule.txt in 5.P1

```
gyra0229@MSI:~/OSu/hw2/5.P1$ make sjf
gcc -Wall -Iinclude -g -DSJF CPU.c driver.c -o sjf
gyra0229@MSI:~/OSu/hw2/5.P1$ ./sjf schedule.txt
Running task = [name: T5, priority: 10, burst: 10, tid: 1]
Task T5 ran for 10 units. Remaining burst = 0 units.
Task T5 finished.
Running task = [name: T4, priority: 3, burst: 15, tid: 2]
Task T4 ran for 15 units. Remaining burst = 0 units.
Task T4 finished.
Running task = [name: T1, priority: 4, burst: 20, tid: 3]
Task T1 ran for 20 units. Remaining burst = 0 units.
Task T1 finished.
Running task = [name: T2, priority: 2, burst: 25, tid: 4]
Task T2 ran for 25 units. Remaining burst = 0 units.
Task T2 finished.
Running task = [name: T3, priority: 3, burst: 25, tid: 5]
Task T3 ran for 25 units. Remaining burst = 0 units.
Task T3 finished.
All tasks done 🐱
Average turnaround time = 49.00
Average waiting time = 30.00
Average response time = 30.00
```

Figure 4: The result for ./sjf schedule.txt in 5.P1

```
gyra0229@MSI:~/OSu/hw2/5.P1$ make priority
gcc -Wall -Iinclude -g -DPRIORITY CPU.c driver.c -o priority
gyra0229@MSI:~/OSu/hw2/5.P1$ ./priority schedule.txt
Running task = [name: T5, priority: 10, burst: 10, tid: 1]
Task T5 ran for 10 units. Remaining burst = 0 units.
Task T5 finished.
Running task = [name: T1, priority: 4, burst: 20, tid: 2]
Task T1 ran for 20 units. Remaining burst = 0 units.
Task T1 finished.
Running task = [name: T3, priority: 3, burst: 25, tid: 3]
Task T3 ran for 25 units. Remaining burst = 0 units.
Task T3 finished.
Running task = [name: T4, priority: 3, burst: 15, tid: 4]
Task T4 ran for 15 units. Remaining burst = 0 units.
Task T4 finished.
Running task = [name: T2, priority: 2, burst: 25, tid: 5]
Task T2 ran for 25 units. Remaining burst = 0 units.
Task T2 finished.
All tasks done 🐱
Average turnaround time = 52.00
Average waiting time = 33.00
Average response time = 33.00
```

Figure 5: The result for ./priority schedule.txt in 5.P1

```
gyra0229@MSI:~/OSu/hw2/5.P1$ make round_robin
gcc -Wall -Iinclude -g -DROUND_ROBIN CPU.c driver.c -o round_robin
gyra0229@MSI:~/OSu/hw2/5.P1$ ./round_robin schedule.txt
Running task = [name: T1, priority: 4, burst: 20, tid: 1]
Task T1 ran for 10 units. Remaining burst = 10 units.
Running task = [name: T2, priority: 2, burst: 25, tid: 2]
Task T2 ran for 10 units. Remaining burst = 15 units.
Running task = [name: T3, priority: 3, burst: 25, tid: 3]
Task T3 ran for 10 units. Remaining burst = 15 units.
Running task = [name: T4, priority: 3, burst: 15, tid: 4]
Task T4 ran for 10 units. Remaining burst = 5 units.
Running task = [name: T5, priority: 10, burst: 10, tid: 5]
Task T5 ran for 10 units. Remaining burst = 0 units.
Task T5 finished.
Running task = [name: T1, priority: 4, burst: 10, tid: 1]
Task T1 ran for 10 units. Remaining burst = 0 units.
Task T1 finished.
Running task = [name: T2, priority: 2, burst: 15, tid: 2]
Task T2 ran for 10 units. Remaining burst = 5 units.
Running task = [name: T3, priority: 3, burst: 25, tid: 3]
Task T3 ran for 10 units. Remaining burst = 15 units.
Running task = [name: T4, priority: 3, burst: 5, tid: 4]
Task T4 ran for 5 units. Remaining burst = 0 units.
Task T4 finished.
Running task = [name: T2, priority: 2, burst: 5, tid: 2]
Task T2 ran for 5 units. Remaining burst = 0 units.
Task T2 finished.
Running task = [name: T3, priority: 3, burst: 5, tid: 3]
Task T3 ran for 5 units. Remaining burst = 0 units.
Task T3 finished.
All tasks done 🐱
Average turnaround time = 76.00
Average waiting time = 57.00
Average response time = 20.00
```

Figure 6: The result for ./round\_robin schedule.txt in 5.P1

```

gyra0229@MSI:~/OSu/hw2/5.P1$ make priority_rr
gcc -Wall -Iinclude -g -DPRIORITY_RR CPU.c driver.c -o priority_rr
gyra0229@MSI:~/OSu/hw2/5.P1$ ./priority_rr schedule.txt
Running task = [name: T5, priority: 10, burst: 10, tid: 1]
Task T5 ran for 10 units. Remaining burst = 0 units.
Task T5 finished.
Running task = [name: T1, priority: 4, burst: 20, tid: 2]
Task T1 ran for 20 units. Remaining burst = 0 units.
Task T1 finished.
Running task = [name: T3, priority: 3, burst: 25, tid: 3]
Task T3 ran for 10 units. Remaining burst = 15 units.
Running task = [name: T4, priority: 3, burst: 15, tid: 4]
Task T4 ran for 10 units. Remaining burst = 5 units.
Running task = [name: T3, priority: 3, burst: 15, tid: 3]
Task T3 ran for 10 units. Remaining burst = 5 units.
Running task = [name: T4, priority: 3, burst: 5, tid: 4]
Task T4 ran for 5 units. Remaining burst = 0 units.
Task T4 finished.
Running task = [name: T3, priority: 3, burst: 5, tid: 3]
Task T3 ran for 5 units. Remaining burst = 0 units.
Task T3 finished.
Running task = [name: T2, priority: 2, burst: 25, tid: 5]
Task T2 ran for 25 units. Remaining burst = 0 units.
Task T2 finished.
All tasks done 🍷
Average turnaround time = 54.00
Average waiting time = 35.00
Average response time = 30.00

```

Figure 7: The result for `./priority_rr schedule.txt` in 5.P1