

OS HW2 Programming projects

資工三 110590001 黃政
資工三 110590004 林奕廷
資工三 110590016 劉硯皓

分工: $\frac{1}{3}$ for each

Environment

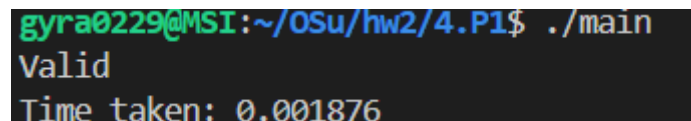
- OS: Ubuntu 22.04
- Kernel: Linux 5.15.153.1-microsoft-standard-WSL2
- Compiler: gcc 11.4.0

Ch4 project 1

Commands

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

Result image

A terminal window with a black background and green text. The prompt is 'gyra0229@MSI:~/OSu/hw2/4.P1\$'. The command './main' has been executed, and the output is 'Valid' followed by 'Time taken: 0.001876' on the next line.

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

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

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 2: The result for ./fcfs 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 4: The result for ./priority 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 3: The result for ./sjf 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: 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: 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 5: 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 6: The result for `./priority_rr schedule.txt` in 5.P1