

Problem 1: There were 2 jobs and 2 tasks and I made the max-runtime 10 and the I/O frequency 0.

```
kentb@DESKTOP-9LC4WCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq
$ ./mlfq.py -j 2 -n 2 -m 10 -M 0 -s 1 -c
Here is the list of inputs:
OPTIONS jobs 2
OPTIONS queues 2
OPTIONS allotments for queue 1 is 1
OPTIONS quantum length for queue 1 is 10
OPTIONS allotments for queue 0 is 1
OPTIONS quantum length for queue 0 is 10
OPTIONS boost 0
OPTIONS ioTime 5
OPTIONS stayAfterIO False
OPTIONS iobump False

For each job, three defining characteristics are given:
  startTime : at what time does the job enter the system
  runTime   : the total CPU time needed by the job to finish
  ioFreq    : every ioFreq time units, the job issues an I/O
               (the I/O takes ioTime units to complete)

Job List:
Job 0: startTime 0 - runTime 2 - ioFreq 0
Job 1: startTime 0 - runTime 7 - ioFreq 0

Execution Trace:

[ time 0 ] JOB BEGINS by JOB 0
[ time 0 ] JOB BEGINS by JOB 1
[ time 0 ] Run JOB 0 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 1 (of 2) ]
[ time 1 ] Run JOB 0 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 0 (of 2) ]
[ time 2 ] FINISHED JOB 0
[ time 2 ] Run JOB 1 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 6 (of 7) ]
[ time 3 ] Run JOB 1 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 5 (of 7) ]
[ time 4 ] Run JOB 1 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 4 (of 7) ]
[ time 5 ] Run JOB 1 at PRIORITY 1 [ TICKS 6 ALLOT 1 TIME 3 (of 7) ]
[ time 6 ] Run JOB 1 at PRIORITY 1 [ TICKS 5 ALLOT 1 TIME 2 (of 7) ]
[ time 7 ] Run JOB 1 at PRIORITY 1 [ TICKS 4 ALLOT 1 TIME 1 (of 7) ]
[ time 8 ] Run JOB 1 at PRIORITY 1 [ TICKS 3 ALLOT 1 TIME 0 (of 7) ]
[ time 9 ] FINISHED JOB 1

Final statistics:
Job 0: startTime 0 - response 0 - turnaround 2
Job 1: startTime 0 - response 2 - turnaround 9

Avg 1: startTime n/a - response 1.00 - turnaround 5.50
```

```
kentb@DESKTOP-9LC4VCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq
```

```
$ ./mlfq.py -j 2 -n 2 -m 10 -M 0 -s 3 -c
```

Here is the list of inputs:

```
OPTIONS jobs 2
OPTIONS queues 2
OPTIONS allotments for queue 1 is 1
OPTIONS quantum length for queue 1 is 10
OPTIONS allotments for queue 0 is 1
OPTIONS quantum length for queue 0 is 10
OPTIONS boost 0
OPTIONS ioTime 5
OPTIONS stayAfterIO False
OPTIONS iobump False
```

For each job, three defining characteristics are given:

```
startTime : at what time does the job enter the system
runTime   : the total CPU time needed by the job to finish
ioFreq    : every ioFreq time units, the job issues an I/O
            (the I/O takes ioTime units to complete)
```

Job List:

```
Job 0: startTime 0 - runTime 3 - ioFreq 0
Job 1: startTime 0 - runTime 4 - ioFreq 0
```

Execution Trace:

```
[ time 0 ] JOB BEGINS by JOB 0
[ time 0 ] JOB BEGINS by JOB 1
[ time 0 ] Run JOB 0 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 2 (of 3) ]
[ time 1 ] Run JOB 0 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 1 (of 3) ]
[ time 2 ] Run JOB 0 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 0 (of 3) ]
[ time 3 ] FINISHED JOB 0
[ time 3 ] Run JOB 1 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 3 (of 4) ]
[ time 4 ] Run JOB 1 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 2 (of 4) ]
[ time 5 ] Run JOB 1 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 1 (of 4) ]
[ time 6 ] Run JOB 1 at PRIORITY 1 [ TICKS 6 ALLOT 1 TIME 0 (of 4) ]
[ time 7 ] FINISHED JOB 1
```

Final statistics:

```
Job 0: startTime 0 - response 0 - turnaround 3
Job 1: startTime 0 - response 3 - turnaround 7
```

```
Avg 1: startTime n/a - response 1.50 - turnaround 5.00
```

Solution 2 : Figure 8.2 There is a time slice of 10 seconds and the job moves down a priority once the time has been exceeded

```
kentb@DESKTOP-9LC4VCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq
$ ./mlfq.py -j 1 -n 3 -q 10 -m 25 -M 0 -c
Here is the list of inputs:
OPTIONS jobs 1
OPTIONS queues 3
OPTIONS allotments for queue 2 is 1
OPTIONS quantum length for queue 2 is 10
OPTIONS allotments for queue 1 is 1
OPTIONS quantum length for queue 1 is 10
OPTIONS allotments for queue 0 is 1
OPTIONS quantum length for queue 0 is 10
OPTIONS boost 0
OPTIONS ioTime 5

For each job, three defining characteristics are given:

For each job, three defining characteristics are given:
  startTime : at what time does the job enter the system
  runTime   : the total CPU time needed by the job to finish
  ioFreq    : every ioFreq time units, the job issues an I/O
              (the I/O takes ioTime units to complete)

Job List:
  Job 0: startTime 0 - runTime 21 - ioFreq 0

Execution Trace:

[ time 0 ] JOB BEGINS by JOB 0
[ time 0 ] Run JOB 0 at PRIORITY 2 [ TICKS 9 ALLOT 1 TIME 20 (of 21) ]
[ time 1 ] Run JOB 0 at PRIORITY 2 [ TICKS 8 ALLOT 1 TIME 19 (of 21) ]
[ time 2 ] Run JOB 0 at PRIORITY 2 [ TICKS 7 ALLOT 1 TIME 18 (of 21) ]
[ time 3 ] Run JOB 0 at PRIORITY 2 [ TICKS 6 ALLOT 1 TIME 17 (of 21) ]
[ time 4 ] Run JOB 0 at PRIORITY 2 [ TICKS 5 ALLOT 1 TIME 16 (of 21) ]
[ time 5 ] Run JOB 0 at PRIORITY 2 [ TICKS 4 ALLOT 1 TIME 15 (of 21) ]
[ time 6 ] Run JOB 0 at PRIORITY 2 [ TICKS 3 ALLOT 1 TIME 14 (of 21) ]
[ time 7 ] Run JOB 0 at PRIORITY 2 [ TICKS 2 ALLOT 1 TIME 13 (of 21) ]
[ time 8 ] Run JOB 0 at PRIORITY 2 [ TICKS 1 ALLOT 1 TIME 12 (of 21) ]
[ time 9 ] Run JOB 0 at PRIORITY 2 [ TICKS 0 ALLOT 1 TIME 11 (of 21) ]
[ time 10 ] Run JOB 0 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 10 (of 21) ]
[ time 11 ] Run JOB 0 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 9 (of 21) ]
[ time 12 ] Run JOB 0 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 8 (of 21) ]
[ time 13 ] Run JOB 0 at PRIORITY 1 [ TICKS 6 ALLOT 1 TIME 7 (of 21) ]
[ time 14 ] Run JOB 0 at PRIORITY 1 [ TICKS 5 ALLOT 1 TIME 6 (of 21) ]
[ time 15 ] Run JOB 0 at PRIORITY 1 [ TICKS 4 ALLOT 1 TIME 5 (of 21) ]
[ time 16 ] Run JOB 0 at PRIORITY 1 [ TICKS 3 ALLOT 1 TIME 4 (of 21) ]
[ time 17 ] Run JOB 0 at PRIORITY 1 [ TICKS 2 ALLOT 1 TIME 3 (of 21) ]
[ time 18 ] Run JOB 0 at PRIORITY 1 [ TICKS 1 ALLOT 1 TIME 2 (of 21) ]
[ time 19 ] Run JOB 0 at PRIORITY 1 [ TICKS 0 ALLOT 1 TIME 1 (of 21) ]
[ time 20 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 0 (of 21) ]
[ time 21 ] FINISHED JOB 0

Final statistics:
  Job 0: startTime 0 - response 0 - turnaround 21
```

Figure 8.3- A smaller job, B, comes at $T=100$ and enters as the highest priority queue and is executed instead of A till B finishes

```
kentb@DESKTOP-9LC4VCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq
$ ./mlfq.py --jlist 0,200,0:100,20,0 -c
```

Here is the list of inputs:

```
OPTIONS jobs 2
OPTIONS queues 3
OPTIONS allotments for queue 2 is 1
OPTIONS quantum length for queue 2 is 10
OPTIONS allotments for queue 1 is 1
OPTIONS quantum length for queue 1 is 10
OPTIONS allotments for queue 0 is 1
OPTIONS quantum length for queue 0 is 10
OPTIONS boost 0
OPTIONS ioTime 5
OPTIONS stayAfterIO False
OPTIONS iobump False
```

For each job, three defining characteristics are given:

```
startTime : at what time does the job enter the system
runTime   : the total CPU time needed by the job to finish
ioFreq    : every ioFreq time units, the job issues an I/O
            (the I/O takes ioTime units to complete)
```

Job List:

```
Job 0: startTime 0 - runTime 200 - ioFreq 0
Job 1: startTime 100 - runTime 20 - ioFreq 0
```

Execution Trace:

```
[ time 0 ] JOB BEGINS by JOB 0
[ time 0 ] Run JOB 0 at PRIORITY 2 [ TICKS 9 ALLOT 1 TIME 199 (of 200) ]
[ time 1 ] Run JOB 0 at PRIORITY 2 [ TICKS 8 ALLOT 1 TIME 198 (of 200) ]
[ time 2 ] Run JOB 0 at PRIORITY 2 [ TICKS 7 ALLOT 1 TIME 197 (of 200) ]
[ time 3 ] Run JOB 0 at PRIORITY 2 [ TICKS 6 ALLOT 1 TIME 196 (of 200) ]
[ time 4 ] Run JOB 0 at PRIORITY 2 [ TICKS 5 ALLOT 1 TIME 195 (of 200) ]
[ time 5 ] Run JOB 0 at PRIORITY 2 [ TICKS 4 ALLOT 1 TIME 194 (of 200) ]
[ time 6 ] Run JOB 0 at PRIORITY 2 [ TICKS 3 ALLOT 1 TIME 193 (of 200) ]
[ time 7 ] Run JOB 0 at PRIORITY 2 [ TICKS 2 ALLOT 1 TIME 192 (of 200) ]
[ time 8 ] Run JOB 0 at PRIORITY 2 [ TICKS 1 ALLOT 1 TIME 191 (of 200) ]
[ time 9 ] Run JOB 0 at PRIORITY 2 [ TICKS 0 ALLOT 1 TIME 190 (of 200) ]
[ time 10 ] Run JOB 0 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 189 (of 200) ]
[ time 11 ] Run JOB 0 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 188 (of 200) ]
[ time 12 ] Run JOB 0 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 187 (of 200) ]
[ time 13 ] Run JOB 0 at PRIORITY 1 [ TICKS 6 ALLOT 1 TIME 186 (of 200) ]
[ time 14 ] Run JOB 0 at PRIORITY 1 [ TICKS 5 ALLOT 1 TIME 185 (of 200) ]
[ time 15 ] Run JOB 0 at PRIORITY 1 [ TICKS 4 ALLOT 1 TIME 184 (of 200) ]
[ time 16 ] Run JOB 0 at PRIORITY 1 [ TICKS 3 ALLOT 1 TIME 183 (of 200) ]
[ time 17 ] Run JOB 0 at PRIORITY 1 [ TICKS 2 ALLOT 1 TIME 182 (of 200) ]
[ time 18 ] Run JOB 0 at PRIORITY 1 [ TICKS 1 ALLOT 1 TIME 181 (of 200) ]
[ time 19 ] Run JOB 0 at PRIORITY 1 [ TICKS 0 ALLOT 1 TIME 180 (of 200) ]
[ time 20 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 179 (of 200) ]
[ time 21 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 178 (of 200) ]
[ time 22 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 177 (of 200) ]
[ time 23 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 176 (of 200) ]
[ time 24 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 175 (of 200) ]
[ time 25 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 174 (of 200) ]
[ time 26 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 173 (of 200) ]
[ time 27 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 172 (of 200) ]
[ time 28 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 171 (of 200) ]
[ time 29 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 170 (of 200) ]
[ time 30 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 169 (of 200) ]
[ time 31 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 168 (of 200) ]
[ time 32 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 167 (of 200) ]
[ time 33 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 166 (of 200) ]
[ time 34 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 165 (of 200) ]
[ time 35 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 164 (of 200) ]
[ time 36 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 163 (of 200) ]
```



```

[ time 158 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 61 (of 200) ]
[ time 159 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 60 (of 200) ]
[ time 160 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 59 (of 200) ]
[ time 175 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 44 (of 200) ]
[ time 176 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 43 (of 200) ]
[ time 177 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 42 (of 200) ]
[ time 178 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 41 (of 200) ]
[ time 179 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 40 (of 200) ]
[ time 180 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 39 (of 200) ]
[ time 181 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 38 (of 200) ]
[ time 182 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 37 (of 200) ]
[ time 183 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 36 (of 200) ]
[ time 184 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 35 (of 200) ]
[ time 185 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 34 (of 200) ]
[ time 186 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 33 (of 200) ]
[ time 187 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 32 (of 200) ]
[ time 188 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 31 (of 200) ]
[ time 189 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 30 (of 200) ]
[ time 190 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 29 (of 200) ]
[ time 191 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 28 (of 200) ]
[ time 192 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 27 (of 200) ]
[ time 193 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 26 (of 200) ]
[ time 194 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 25 (of 200) ]
[ time 195 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 24 (of 200) ]
[ time 196 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 23 (of 200) ]
[ time 197 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 22 (of 200) ]
[ time 198 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 21 (of 200) ]
[ time 199 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 20 (of 200) ]
[ time 200 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 19 (of 200) ]
[ time 201 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 18 (of 200) ]
[ time 202 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 17 (of 200) ]
[ time 203 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 16 (of 200) ]
[ time 204 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 15 (of 200) ]
[ time 205 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 14 (of 200) ]
[ time 206 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 13 (of 200) ]
[ time 207 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 12 (of 200) ]
[ time 208 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 11 (of 200) ]
[ time 209 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 10 (of 200) ]
[ time 210 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 9 (of 200) ]
[ time 211 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 8 (of 200) ]
[ time 212 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 7 (of 200) ]
[ time 213 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 6 (of 200) ]
[ time 214 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 5 (of 200) ]
[ time 215 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 4 (of 200) ]
[ time 216 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 3 (of 200) ]
[ time 217 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 2 (of 200) ]
[ time 218 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 1 (of 200) ]
[ time 219 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 0 (of 200) ]
[ time 220 ] FINISHED JOB 0

Final statistics:
  Job 0: startTime 0 - response 0 - turnaround 220
  Job 1: startTime 100 - response 0 - turnaround 20

  Avg 1: startTime n/a - response 0.00 - turnaround 120.00

```

Figure 8.4- Job 1 is executed at T=50 and stays in the highest priority queue due to the I/O

```
kentb@DESKTOP-9LC4VCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq
```

```
$ ./mlfq.py --jlist 0,200,0:50,20,1 -c
```

Here is the list of inputs:

```
OPTIONS jobs 2
```

```
OPTIONS queues 3
```

```
OPTIONS allotments for queue 2 is 1
```

```
OPTIONS quantum length for queue 2 is 10
```

```
OPTIONS allotments for queue 1 is 1
```

```
OPTIONS quantum length for queue 1 is 10
```

```
OPTIONS allotments for queue 0 is 1
```

```
OPTIONS quantum length for queue 0 is 10
```

```
OPTIONS boost 0
```

```
OPTIONS ioTime 5
```

```
OPTIONS stayAfterIO False
```

```
OPTIONS iobump False
```

For each job, three defining characteristics are given:

startTime : at what time does the job enter the system

runTime : the total CPU time needed by the job to finish

ioFreq : every ioFreq time units, the job issues an I/O
(the I/O takes ioTime units to complete)

Job List:

Job 0: startTime 0 - runTime 200 - ioFreq 0

Job 1: startTime 50 - runTime 20 - ioFreq 1

Execution Trace:

```
[ time 0 ] JOB BEGINS by JOB 0
[ time 0 ] Run JOB 0 at PRIORITY 2 [ TICKS 9 ALLOT 1 TIME 199 (of 200) ]
[ time 1 ] Run JOB 0 at PRIORITY 2 [ TICKS 8 ALLOT 1 TIME 198 (of 200) ]
[ time 2 ] Run JOB 0 at PRIORITY 2 [ TICKS 7 ALLOT 1 TIME 197 (of 200) ]
[ time 3 ] Run JOB 0 at PRIORITY 2 [ TICKS 6 ALLOT 1 TIME 196 (of 200) ]
[ time 4 ] Run JOB 0 at PRIORITY 2 [ TICKS 5 ALLOT 1 TIME 195 (of 200) ]
[ time 5 ] Run JOB 0 at PRIORITY 2 [ TICKS 4 ALLOT 1 TIME 194 (of 200) ]
[ time 6 ] Run JOB 0 at PRIORITY 2 [ TICKS 3 ALLOT 1 TIME 193 (of 200) ]
[ time 7 ] Run JOB 0 at PRIORITY 2 [ TICKS 2 ALLOT 1 TIME 192 (of 200) ]
[ time 8 ] Run JOB 0 at PRIORITY 2 [ TICKS 1 ALLOT 1 TIME 191 (of 200) ]
[ time 9 ] Run JOB 0 at PRIORITY 2 [ TICKS 0 ALLOT 1 TIME 190 (of 200) ]
[ time 10 ] Run JOB 0 at PRIORITY 1 [ TICKS 9 ALLOT 1 TIME 189 (of 200) ]
[ time 11 ] Run JOB 0 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 188 (of 200) ]
[ time 12 ] Run JOB 0 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 187 (of 200) ]
[ time 13 ] Run JOB 0 at PRIORITY 1 [ TICKS 6 ALLOT 1 TIME 186 (of 200) ]
[ time 14 ] Run JOB 0 at PRIORITY 1 [ TICKS 5 ALLOT 1 TIME 185 (of 200) ]
[ time 15 ] Run JOB 0 at PRIORITY 1 [ TICKS 4 ALLOT 1 TIME 184 (of 200) ]
[ time 16 ] Run JOB 0 at PRIORITY 1 [ TICKS 3 ALLOT 1 TIME 183 (of 200) ]
[ time 17 ] Run JOB 0 at PRIORITY 1 [ TICKS 2 ALLOT 1 TIME 182 (of 200) ]
[ time 18 ] Run JOB 0 at PRIORITY 1 [ TICKS 1 ALLOT 1 TIME 181 (of 200) ]
[ time 19 ] Run JOB 0 at PRIORITY 1 [ TICKS 0 ALLOT 1 TIME 180 (of 200) ]
[ time 20 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 179 (of 200) ]
[ time 21 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 178 (of 200) ]
[ time 22 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 177 (of 200) ]
[ time 23 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 176 (of 200) ]
[ time 24 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 175 (of 200) ]
[ time 25 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 174 (of 200) ]
[ time 26 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 173 (of 200) ]
[ time 27 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 172 (of 200) ]
[ time 28 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 171 (of 200) ]
[ time 29 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 170 (of 200) ]
[ time 30 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 169 (of 200) ]
```



```
[ time 48 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 151 (of 200) ]
[ time 49 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 150 (of 200) ]
[ time 50 ] JOB BEGINS by JOB 1
[ time 50 ] Run JOB 1 at PRIORITY 2 [ TICKS 9 ALLOT 1 TIME 19 (of 20) ]
[ time 51 ] IO_START by JOB 1
IO DONE
[ time 51 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 149 (of 200) ]
[ time 52 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 148 (of 200) ]
[ time 53 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 147 (of 200) ]
[ time 54 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 146 (of 200) ]
[ time 55 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 145 (of 200) ]
[ time 56 ] IO_DONE by JOB 1
[ time 56 ] Run JOB 1 at PRIORITY 2 [ TICKS 8 ALLOT 1 TIME 18 (of 20) ]
[ time 57 ] IO_START by JOB 1
IO DONE
[ time 57 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 144 (of 200) ]
[ time 58 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 143 (of 200) ]
[ time 59 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 142 (of 200) ]
[ time 60 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 141 (of 200) ]
[ time 61 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 140 (of 200) ]
[ time 62 ] IO_DONE by JOB 1
[ time 62 ] Run JOB 1 at PRIORITY 2 [ TICKS 7 ALLOT 1 TIME 17 (of 20) ]
[ time 63 ] IO_START by JOB 1
IO DONE
[ time 63 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 139 (of 200) ]
[ time 64 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 138 (of 200) ]
[ time 65 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 137 (of 200) ]
[ time 66 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 136 (of 200) ]
[ time 67 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 135 (of 200) ]
[ time 68 ] IO_DONE by JOB 1
[ time 68 ] Run JOB 1 at PRIORITY 2 [ TICKS 6 ALLOT 1 TIME 16 (of 20) ]
[ time 69 ] IO_START by JOB 1
IO DONE
[ time 69 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 134 (of 200) ]
[ time 70 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 133 (of 200) ]
[ time 71 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 132 (of 200) ]
[ time 72 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 131 (of 200) ]
[ time 73 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 130 (of 200) ]
[ time 74 ] IO_DONE by JOB 1
[ time 74 ] Run JOB 1 at PRIORITY 2 [ TICKS 5 ALLOT 1 TIME 15 (of 20) ]
[ time 75 ] IO_START by JOB 1
IO DONE
[ time 75 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 129 (of 200) ]
[ time 76 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 128 (of 200) ]
[ time 77 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 127 (of 200) ]
[ time 78 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 126 (of 200) ]
[ time 79 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 125 (of 200) ]
[ time 80 ] IO_DONE by JOB 1
[ time 80 ] Run JOB 1 at PRIORITY 2 [ TICKS 4 ALLOT 1 TIME 14 (of 20) ]
[ time 81 ] IO_START by JOB 1
IO DONE
[ time 81 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 124 (of 200) ]
[ time 82 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 123 (of 200) ]
[ time 83 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 122 (of 200) ]
[ time 84 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 121 (of 200) ]
[ time 85 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 120 (of 200) ]
[ time 86 ] IO_DONE by JOB 1
[ time 86 ] Run JOB 1 at PRIORITY 2 [ TICKS 3 ALLOT 1 TIME 13 (of 20) ]
[ time 87 ] IO_START by JOB 1
IO DONE
[ time 87 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 119 (of 200) ]
[ time 88 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 118 (of 200) ]
[ time 89 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 117 (of 200) ]
[ time 90 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 116 (of 200) ]
[ time 91 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 115 (of 200) ]
[ time 92 ] IO_DONE by JOB 1
[ time 92 ] Run JOB 1 at PRIORITY 2 [ TICKS 2 ALLOT 1 TIME 12 (of 20) ]
[ time 93 ] IO_START by JOB 1
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IO DONE
[ time 111 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 99 (of 200) ]
[ time 112 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 98 (of 200) ]
[ time 113 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 97 (of 200) ]
[ time 114 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 96 (of 200) ]
[ time 115 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 95 (of 200) ]
[ time 116 ] IO_DONE by JOB 1
[ time 116 ] Run JOB 1 at PRIORITY 1 [ TICKS 8 ALLOT 1 TIME 8 (of 20) ]
[ time 117 ] IO_START by JOB 1
IO DONE
[ time 117 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 94 (of 200) ]
[ time 118 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 93 (of 200) ]
[ time 119 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 92 (of 200) ]
[ time 120 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 91 (of 200) ]
[ time 121 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 90 (of 200) ]
[ time 122 ] IO_DONE by JOB 1
[ time 122 ] Run JOB 1 at PRIORITY 1 [ TICKS 7 ALLOT 1 TIME 7 (of 20) ]
[ time 123 ] IO_START by JOB 1
IO DONE
[ time 123 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 89 (of 200) ]
[ time 124 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 88 (of 200) ]
[ time 125 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 87 (of 200) ]
[ time 126 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 86 (of 200) ]
[ time 127 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 85 (of 200) ]
[ time 128 ] IO_DONE by JOB 1
[ time 128 ] Run JOB 1 at PRIORITY 1 [ TICKS 6 ALLOT 1 TIME 6 (of 20) ]
[ time 129 ] IO_START by JOB 1
IO DONE
[ time 129 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 84 (of 200) ]
[ time 130 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 83 (of 200) ]
[ time 131 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 82 (of 200) ]
[ time 132 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 81 (of 200) ]
[ time 133 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 80 (of 200) ]
[ time 134 ] IO_DONE by JOB 1
[ time 134 ] Run JOB 1 at PRIORITY 1 [ TICKS 5 ALLOT 1 TIME 5 (of 20) ]
[ time 135 ] IO_START by JOB 1
IO DONE
[ time 135 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 79 (of 200) ]
[ time 136 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 78 (of 200) ]
[ time 137 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 77 (of 200) ]
[ time 138 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 76 (of 200) ]
[ time 139 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 75 (of 200) ]
[ time 140 ] IO_DONE by JOB 1
[ time 140 ] Run JOB 1 at PRIORITY 1 [ TICKS 4 ALLOT 1 TIME 4 (of 20) ]
[ time 141 ] IO_START by JOB 1
IO DONE
[ time 141 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 74 (of 200) ]
[ time 142 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 73 (of 200) ]
[ time 143 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 72 (of 200) ]
[ time 144 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 71 (of 200) ]
[ time 145 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 70 (of 200) ]
[ time 146 ] IO_DONE by JOB 1
[ time 146 ] Run JOB 1 at PRIORITY 1 [ TICKS 3 ALLOT 1 TIME 3 (of 20) ]
[ time 147 ] IO_START by JOB 1
IO DONE
[ time 147 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 69 (of 200) ]
[ time 148 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 68 (of 200) ]
[ time 149 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 67 (of 200) ]
[ time 150 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 66 (of 200) ]
[ time 151 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 65 (of 200) ]
[ time 152 ] IO_DONE by JOB 1
[ time 152 ] Run JOB 1 at PRIORITY 1 [ TICKS 2 ALLOT 1 TIME 2 (of 20) ]
[ time 153 ] IO_START by JOB 1
IO DONE
[ time 153 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 64 (of 200) ]
[ time 154 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 63 (of 200) ]
[ time 155 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 62 (of 200) ]
[ time 156 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 61 (of 200) ]

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[ time 158 ] Run JOB 1 at PRIORITY 1 [ TICKS 1 ALLOT 1 TIME 1 (of 20) ]
[ time 159 ] IO_START by JOB 1
IO DONE
[ time 159 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 59 (of 200) ]
[ time 160 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 58 (of 200) ]
[ time 161 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 57 (of 200) ]
[ time 162 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 56 (of 200) ]
[ time 163 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 55 (of 200) ]
[ time 164 ] IO_DONE by JOB 1
[ time 164 ] Run JOB 1 at PRIORITY 1 [ TICKS 0 ALLOT 1 TIME 0 (of 20) ]
[ time 165 ] FINISHED JOB 1
[ time 165 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 54 (of 200) ]
[ time 166 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 53 (of 200) ]
[ time 167 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 52 (of 200) ]
[ time 168 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 51 (of 200) ]
[ time 169 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 50 (of 200) ]
[ time 170 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 49 (of 200) ]
[ time 171 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 48 (of 200) ]
[ time 172 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 47 (of 200) ]
[ time 173 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 46 (of 200) ]
[ time 174 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 45 (of 200) ]
[ time 175 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 44 (of 200) ]
[ time 176 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 43 (of 200) ]
[ time 177 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 42 (of 200) ]
[ time 178 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 41 (of 200) ]
[ time 179 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 40 (of 200) ]
[ time 180 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 39 (of 200) ]
[ time 181 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 38 (of 200) ]
[ time 182 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 37 (of 200) ]
[ time 183 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 36 (of 200) ]
[ time 184 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 35 (of 200) ]
[ time 185 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 34 (of 200) ]
[ time 186 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 33 (of 200) ]
[ time 187 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 32 (of 200) ]
[ time 188 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 31 (of 200) ]
[ time 189 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 30 (of 200) ]
[ time 190 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 29 (of 200) ]
[ time 191 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 28 (of 200) ]
[ time 192 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 27 (of 200) ]
[ time 193 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 26 (of 200) ]
[ time 194 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 25 (of 200) ]
[ time 195 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 24 (of 200) ]
[ time 196 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 23 (of 200) ]
[ time 197 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 22 (of 200) ]
[ time 198 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 21 (of 200) ]
[ time 199 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 20 (of 200) ]
[ time 200 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 19 (of 200) ]
[ time 201 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 18 (of 200) ]
[ time 202 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 17 (of 200) ]
[ time 203 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 16 (of 200) ]
[ time 204 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 15 (of 200) ]
[ time 205 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 14 (of 200) ]
[ time 206 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 13 (of 200) ]
[ time 207 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 12 (of 200) ]
[ time 208 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 11 (of 200) ]
[ time 209 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 10 (of 200) ]
[ time 210 ] Run JOB 0 at PRIORITY 0 [ TICKS 9 ALLOT 1 TIME 9 (of 200) ]
[ time 211 ] Run JOB 0 at PRIORITY 0 [ TICKS 8 ALLOT 1 TIME 8 (of 200) ]
[ time 212 ] Run JOB 0 at PRIORITY 0 [ TICKS 7 ALLOT 1 TIME 7 (of 200) ]
[ time 213 ] Run JOB 0 at PRIORITY 0 [ TICKS 6 ALLOT 1 TIME 6 (of 200) ]
[ time 214 ] Run JOB 0 at PRIORITY 0 [ TICKS 5 ALLOT 1 TIME 5 (of 200) ]
[ time 215 ] Run JOB 0 at PRIORITY 0 [ TICKS 4 ALLOT 1 TIME 4 (of 200) ]
[ time 216 ] Run JOB 0 at PRIORITY 0 [ TICKS 3 ALLOT 1 TIME 3 (of 200) ]
[ time 217 ] Run JOB 0 at PRIORITY 0 [ TICKS 2 ALLOT 1 TIME 2 (of 200) ]
[ time 218 ] Run JOB 0 at PRIORITY 0 [ TICKS 1 ALLOT 1 TIME 1 (of 200) ]
[ time 219 ] Run JOB 0 at PRIORITY 0 [ TICKS 0 ALLOT 1 TIME 0 (of 200) ]
Job 0: startTime 0 - response 0 - turnaround 220
Job 1: startTime 50 - response 0 - turnaround 115
```

Figure 8.5 Left -- Job 1 and 2 come in at T=100 and with a high priority and are executed while Job 0 waits for their completion

```
kentb@DESKTOP-9LC4VCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq
```

```
$ ./mlfq.py --jlist 0,200,0:100,20,1:100,20,1 -i 1 -c
```

Here is the list of inputs:

OPTIONS jobs 3

OPTIONS queues 3

OPTIONS allotments for queue 2 is 1

OPTIONS quantum length for queue 2 is 10

OPTIONS allotments for queue 1 is 1

OPTIONS quantum length for queue 1 is 10

OPTIONS allotments for queue 0 is 1

OPTIONS quantum length for queue 0 is 10

OPTIONS boost 0

OPTIONS ioTime 1

OPTIONS stayAfterIO False

OPTIONS iobump False

For each job, three defining characteristics are given:

startTime : at what time does the job enter the system

runTime : the total CPU time needed by the job to finish

ioFreq : every ioFreq time units, the job issues an I/O
(the I/O takes ioTime units to complete)

Job List:

Job 0: startTime 0 - runTime 200 - ioFreq 0

Job 1: startTime 100 - runTime 20 - ioFreq 1

Job 2: startTime 100 - runTime 20 - ioFreq 1

Execution Trace:

[time 0] JOB BEGINS by JOB 0

[time 0] Run JOB 0 at PRIORITY 2 [TICKS 9 ALLOT 1 TIME 199 (of 200)]

[time 1] Run JOB 0 at PRIORITY 2 [TICKS 8 ALLOT 1 TIME 198 (of 200)]

[time 2] Run JOB 0 at PRIORITY 2 [TICKS 7 ALLOT 1 TIME 197 (of 200)]

[time 3] Run JOB 0 at PRIORITY 2 [TICKS 6 ALLOT 1 TIME 196 (of 200)]

[time 4] Run JOB 0 at PRIORITY 2 [TICKS 5 ALLOT 1 TIME 195 (of 200)]

[time 5] Run JOB 0 at PRIORITY 2 [TICKS 4 ALLOT 1 TIME 194 (of 200)]

[time 6] Run JOB 0 at PRIORITY 2 [TICKS 3 ALLOT 1 TIME 193 (of 200)]

[time 7] Run JOB 0 at PRIORITY 2 [TICKS 2 ALLOT 1 TIME 192 (of 200)]

[time 8] Run JOB 0 at PRIORITY 2 [TICKS 1 ALLOT 1 TIME 191 (of 200)]

[time 9] Run JOB 0 at PRIORITY 2 [TICKS 0 ALLOT 1 TIME 190 (of 200)]

[illegible]

[illegible]

[time 98] Run JOB 0 at PRIORITY 0 [TICKS 1 ALLOT 1 TIME 101 (of 200)]
[time 99] Run JOB 0 at PRIORITY 0 [TICKS 0 ALLOT 1 TIME 100 (of 200)]
[time 100] JOB BEGINS by JOB 1
[time 100] JOB BEGINS by JOB 2
[time 100] Run JOB 1 at PRIORITY 2 [TICKS 9 ALLOT 1 TIME 19 (of 20)]
[time 101] IO_START by JOB 1
IO DONE
[time 101] Run JOB 2 at PRIORITY 2 [TICKS 9 ALLOT 1 TIME 19 (of 20)]
[time 102] IO_START by JOB 2
IO DONE
[time 102] IO_DONE by JOB 1
[time 102] Run JOB 1 at PRIORITY 2 [TICKS 8 ALLOT 1 TIME 18 (of 20)]
[time 103] IO_START by JOB 1
IO DONE
[time 103] IO_DONE by JOB 2
[time 103] Run JOB 2 at PRIORITY 2 [TICKS 8 ALLOT 1 TIME 18 (of 20)]
[time 104] IO_START by JOB 2
IO DONE
[time 104] IO_DONE by JOB 1
[time 104] Run JOB 1 at PRIORITY 2 [TICKS 7 ALLOT 1 TIME 17 (of 20)]
[time 105] IO_START by JOB 1
IO DONE
[time 105] IO_DONE by JOB 2
[time 105] Run JOB 2 at PRIORITY 2 [TICKS 7 ALLOT 1 TIME 17 (of 20)]
[time 106] IO_START by JOB 2
IO DONE
[time 106] IO_DONE by JOB 1
[time 106] Run JOB 1 at PRIORITY 2 [TICKS 6 ALLOT 1 TIME 16 (of 20)]
[time 107] IO_START by JOB 1
IO DONE
[time 107] IO_DONE by JOB 2
[time 107] Run JOB 2 at PRIORITY 2 [TICKS 6 ALLOT 1 TIME 16 (of 20)]
[time 108] IO_START by JOB 2
IO DONE
[time 108] IO_DONE by JOB 1
[time 108] Run JOB 1 at PRIORITY 2 [TICKS 5 ALLOT 1 TIME 15 (of 20)]
[time 109] IO_START by JOB 1
IO DONE
[time 109] IO_DONE by JOB 2
[time 109] Run JOB 2 at PRIORITY 2 [TICKS 5 ALLOT 1 TIME 15 (of 20)]
[time 110] IO_START by JOB 2
IO DONE
[time 110] IO_DONE by JOB 1
[time 110] Run JOB 1 at PRIORITY 2 [TICKS 4 ALLOT 1 TIME 14 (of 20)]

[time 111] IO_START by JOB 1
IO DONE
[time 111] IO_DONE by JOB 2
[time 111] Run JOB 2 at PRIORITY 2 [TICKS 4 ALLOT 1 TIME 14 (of 20)]
[time 112] IO_START by JOB 2
IO DONE
[time 112] IO_DONE by JOB 1
[time 112] Run JOB 1 at PRIORITY 2 [TICKS 3 ALLOT 1 TIME 13 (of 20)]
[time 113] IO_START by JOB 1
IO DONE
[time 113] IO_DONE by JOB 2
[time 113] Run JOB 2 at PRIORITY 2 [TICKS 3 ALLOT 1 TIME 13 (of 20)]
[time 114] IO_START by JOB 2
IO DONE
[time 114] IO_DONE by JOB 1
[time 114] Run JOB 1 at PRIORITY 2 [TICKS 2 ALLOT 1 TIME 12 (of 20)]
[time 115] IO_START by JOB 1
IO DONE
[time 115] IO_DONE by JOB 2
[time 115] Run JOB 2 at PRIORITY 2 [TICKS 2 ALLOT 1 TIME 12 (of 20)]
[time 116] IO_START by JOB 2
IO DONE
[time 116] IO_DONE by JOB 1
[time 116] Run JOB 1 at PRIORITY 2 [TICKS 1 ALLOT 1 TIME 11 (of 20)]
[time 117] IO_START by JOB 1
IO DONE
[time 117] IO_DONE by JOB 2
[time 117] Run JOB 2 at PRIORITY 2 [TICKS 1 ALLOT 1 TIME 11 (of 20)]
[time 118] IO_START by JOB 2
IO DONE
[time 118] IO_DONE by JOB 1
[time 118] Run JOB 1 at PRIORITY 2 [TICKS 0 ALLOT 1 TIME 10 (of 20)]
[time 119] IO_START by JOB 1
IO DONE
[time 119] IO_DONE by JOB 2
[time 119] Run JOB 2 at PRIORITY 2 [TICKS 0 ALLOT 1 TIME 10 (of 20)]
[time 120] IO_START by JOB 2
IO DONE
[time 120] IO_DONE by JOB 1
[time 120] Run JOB 1 at PRIORITY 1 [TICKS 9 ALLOT 1 TIME 9 (of 20)]
[time 121] IO_START by JOB 1
IO DONE
[time 121] IO_DONE by JOB 2
[time 121] Run JOB 2 at PRIORITY 1 [TICKS 9 ALLOT 1 TIME 9 (of 20)]

[time 122] IO_START by JOB 2
IO DONE
[time 122] IO_DONE by JOB 1
[time 122] Run JOB 1 at PRIORITY 1 [TICKS 8 ALLOT 1 TIME 8 (of 20)]
[time 123] IO_START by JOB 1
IO DONE
[time 123] IO_DONE by JOB 2
[time 123] Run JOB 2 at PRIORITY 1 [TICKS 8 ALLOT 1 TIME 8 (of 20)]
[time 124] IO_START by JOB 2
IO DONE
[time 124] IO_DONE by JOB 1
[time 124] Run JOB 1 at PRIORITY 1 [TICKS 7 ALLOT 1 TIME 7 (of 20)]
[time 125] IO_START by JOB 1
IO DONE
[time 125] IO_DONE by JOB 2
[time 125] Run JOB 2 at PRIORITY 1 [TICKS 7 ALLOT 1 TIME 7 (of 20)]
[time 126] IO_START by JOB 2
IO DONE
[time 126] IO_DONE by JOB 1
[time 126] Run JOB 1 at PRIORITY 1 [TICKS 6 ALLOT 1 TIME 6 (of 20)]
[time 127] IO_START by JOB 1
IO DONE
[time 127] IO_DONE by JOB 2
[time 127] Run JOB 2 at PRIORITY 1 [TICKS 6 ALLOT 1 TIME 6 (of 20)]
[time 128] IO_START by JOB 2
IO DONE
[time 128] IO_DONE by JOB 1
[time 128] Run JOB 1 at PRIORITY 1 [TICKS 5 ALLOT 1 TIME 5 (of 20)]
[time 129] IO_START by JOB 1
IO DONE
[time 129] IO_DONE by JOB 2
[time 129] Run JOB 2 at PRIORITY 1 [TICKS 5 ALLOT 1 TIME 5 (of 20)]
[time 130] IO_START by JOB 2
IO DONE
[time 130] IO_DONE by JOB 1
[time 130] Run JOB 1 at PRIORITY 1 [TICKS 4 ALLOT 1 TIME 4 (of 20)]
[time 131] IO_START by JOB 1
IO DONE
[time 131] IO_DONE by JOB 2
[time 131] Run JOB 2 at PRIORITY 1 [TICKS 4 ALLOT 1 TIME 4 (of 20)]
[time 132] IO_START by JOB 2
IO DONE
[time 132] IO_DONE by JOB 1
[time 132] Run JOB 1 at PRIORITY 1 [TICKS 3 ALLOT 1 TIME 3 (of 20)]

[time 133] IO_START by JOB 1
IO DONE
[time 133] IO_DONE by JOB 2
[time 133] Run JOB 2 at PRIORITY 1 [TICKS 3 ALLOT 1 TIME 3 (of 20)]
[time 134] IO_START by JOB 2
IO DONE
[time 134] IO_DONE by JOB 1
[time 134] Run JOB 1 at PRIORITY 1 [TICKS 2 ALLOT 1 TIME 2 (of 20)]
[time 135] IO_START by JOB 1
IO DONE
[time 135] IO_DONE by JOB 2
[time 135] Run JOB 2 at PRIORITY 1 [TICKS 2 ALLOT 1 TIME 2 (of 20)]
[time 136] IO_START by JOB 2
IO DONE
[time 136] IO_DONE by JOB 1
[time 136] Run JOB 1 at PRIORITY 1 [TICKS 1 ALLOT 1 TIME 1 (of 20)]
[time 137] IO_START by JOB 1
IO DONE
[time 137] IO_DONE by JOB 2
[time 137] Run JOB 2 at PRIORITY 1 [TICKS 1 ALLOT 1 TIME 1 (of 20)]
[time 138] IO_START by JOB 2
IO DONE
[time 138] IO_DONE by JOB 1
[time 138] Run JOB 1 at PRIORITY 1 [TICKS 0 ALLOT 1 TIME 0 (of 20)]
[time 139] FINISHED JOB 1
[time 139] IO_DONE by JOB 2
[time 139] Run JOB 2 at PRIORITY 1 [TICKS 0 ALLOT 1 TIME 0 (of 20)]
[time 140] FINISHED JOB 2
[time 140] Run JOB 0 at PRIORITY 0 [TICKS 9 ALLOT 1 TIME 99 (of 200)]
[time 141] Run JOB 0 at PRIORITY 0 [TICKS 8 ALLOT 1 TIME 98 (of 200)]
[time 142] Run JOB 0 at PRIORITY 0 [TICKS 7 ALLOT 1 TIME 97 (of 200)]
[time 143] Run JOB 0 at PRIORITY 0 [TICKS 6 ALLOT 1 TIME 96 (of 200)]
[time 144] Run JOB 0 at PRIORITY 0 [TICKS 5 ALLOT 1 TIME 95 (of 200)]
[time 145] Run JOB 0 at PRIORITY 0 [TICKS 4 ALLOT 1 TIME 94 (of 200)]
[time 146] Run JOB 0 at PRIORITY 0 [TICKS 3 ALLOT 1 TIME 93 (of 200)]
[time 147] Run JOB 0 at PRIORITY 0 [TICKS 2 ALLOT 1 TIME 92 (of 200)]
[time 148] Run JOB 0 at PRIORITY 0 [TICKS 1 ALLOT 1 TIME 91 (of 200)]
[time 149] Run JOB 0 at PRIORITY 0 [TICKS 0 ALLOT 1 TIME 90 (of 200)]
[time 150] Run JOB 0 at PRIORITY 0 [TICKS 9 ALLOT 1 TIME 89 (of 200)]
[time 151] Run JOB 0 at PRIORITY 0 [TICKS 8 ALLOT 1 TIME 88 (of 200)]
[time 152] Run JOB 0 at PRIORITY 0 [TICKS 7 ALLOT 1 TIME 87 (of 200)]
[time 153] Run JOB 0 at PRIORITY 0 [TICKS 6 ALLOT 1 TIME 86 (of 200)]
[time 154] Run JOB 0 at PRIORITY 0 [TICKS 5 ALLOT 1 TIME 85 (of 200)]
[time 155] Run JOB 0 at PRIORITY 0 [TICKS 4 ALLOT 1 TIME 84 (of 200)]

[illegible]

[time 200] Run JOB 0 at PRIORITY 0 [TICKS 9 ALLOT 1 TIME 39 (of 200)]
[time 201] Run JOB 0 at PRIORITY 0 [TICKS 8 ALLOT 1 TIME 38 (of 200)]
[time 202] Run JOB 0 at PRIORITY 0 [TICKS 7 ALLOT 1 TIME 37 (of 200)]
[time 203] Run JOB 0 at PRIORITY 0 [TICKS 6 ALLOT 1 TIME 36 (of 200)]
[time 204] Run JOB 0 at PRIORITY 0 [TICKS 5 ALLOT 1 TIME 35 (of 200)]
[time 205] Run JOB 0 at PRIORITY 0 [TICKS 4 ALLOT 1 TIME 34 (of 200)]
[time 206] Run JOB 0 at PRIORITY 0 [TICKS 3 ALLOT 1 TIME 33 (of 200)]
[time 207] Run JOB 0 at PRIORITY 0 [TICKS 2 ALLOT 1 TIME 32 (of 200)]
[time 208] Run JOB 0 at PRIORITY 0 [TICKS 1 ALLOT 1 TIME 31 (of 200)]
[time 209] Run JOB 0 at PRIORITY 0 [TICKS 0 ALLOT 1 TIME 30 (of 200)]
[time 210] Run JOB 0 at PRIORITY 0 [TICKS 9 ALLOT 1 TIME 29 (of 200)]
[time 211] Run JOB 0 at PRIORITY 0 [TICKS 8 ALLOT 1 TIME 28 (of 200)]
[time 212] Run JOB 0 at PRIORITY 0 [TICKS 7 ALLOT 1 TIME 27 (of 200)]
[time 213] Run JOB 0 at PRIORITY 0 [TICKS 6 ALLOT 1 TIME 26 (of 200)]
[time 214] Run JOB 0 at PRIORITY 0 [TICKS 5 ALLOT 1 TIME 25 (of 200)]
[time 215] Run JOB 0 at PRIORITY 0 [TICKS 4 ALLOT 1 TIME 24 (of 200)]
[time 216] Run JOB 0 at PRIORITY 0 [TICKS 3 ALLOT 1 TIME 23 (of 200)]
[time 217] Run JOB 0 at PRIORITY 0 [TICKS 2 ALLOT 1 TIME 22 (of 200)]
[time 218] Run JOB 0 at PRIORITY 0 [TICKS 1 ALLOT 1 TIME 21 (of 200)]
[time 219] Run JOB 0 at PRIORITY 0 [TICKS 0 ALLOT 1 TIME 20 (of 200)]
[time 220] Run JOB 0 at PRIORITY 0 [TICKS 9 ALLOT 1 TIME 19 (of 200)]
[time 221] Run JOB 0 at PRIORITY 0 [TICKS 8 ALLOT 1 TIME 18 (of 200)]
[time 222] Run JOB 0 at PRIORITY 0 [TICKS 7 ALLOT 1 TIME 17 (of 200)]
[time 223] Run JOB 0 at PRIORITY 0 [TICKS 6 ALLOT 1 TIME 16 (of 200)]
[time 224] Run JOB 0 at PRIORITY 0 [TICKS 5 ALLOT 1 TIME 15 (of 200)]
[time 225] Run JOB 0 at PRIORITY 0 [TICKS 4 ALLOT 1 TIME 14 (of 200)]
[time 226] Run JOB 0 at PRIORITY 0 [TICKS 3 ALLOT 1 TIME 13 (of 200)]
[time 227] Run JOB 0 at PRIORITY 0 [TICKS 2 ALLOT 1 TIME 12 (of 200)]
[time 228] Run JOB 0 at PRIORITY 0 [TICKS 1 ALLOT 1 TIME 11 (of 200)]
[time 229] Run JOB 0 at PRIORITY 0 [TICKS 0 ALLOT 1 TIME 10 (of 200)]
[time 230] Run JOB 0 at PRIORITY 0 [TICKS 9 ALLOT 1 TIME 9 (of 200)]
[time 231] Run JOB 0 at PRIORITY 0 [TICKS 8 ALLOT 1 TIME 8 (of 200)]
[time 232] Run JOB 0 at PRIORITY 0 [TICKS 7 ALLOT 1 TIME 7 (of 200)]
[time 233] Run JOB 0 at PRIORITY 0 [TICKS 6 ALLOT 1 TIME 6 (of 200)]
[time 234] Run JOB 0 at PRIORITY 0 [TICKS 5 ALLOT 1 TIME 5 (of 200)]
[time 235] Run JOB 0 at PRIORITY 0 [TICKS 4 ALLOT 1 TIME 4 (of 200)]
[time 236] Run JOB 0 at PRIORITY 0 [TICKS 3 ALLOT 1 TIME 3 (of 200)]
[time 237] Run JOB 0 at PRIORITY 0 [TICKS 2 ALLOT 1 TIME 2 (of 200)]
[time 238] Run JOB 0 at PRIORITY 0 [TICKS 1 ALLOT 1 TIME 1 (of 200)]
[time 239] Run JOB 0 at PRIORITY 0 [TICKS 0 ALLOT 1 TIME 0 (of 200)]
[time 240] FINISHED JOB 0

Final statistics:

Job 0: startTime 0 - response 0 - turnaround 240

Job 1: startTime 100 - response 0 - turnaround 39

Job 2: startTime 100 - response 1 - turnaround 40

Avg 2: startTime n/a - response 0.33 - turnaround 106.33

Figure 8.7- the time slice for the queues get longer as the priority decreases

kentb@DESKTOP-9LC4VCE MINGW64 ~/PycharmProjects/hw/cpu-sched-mlfq

\$./mlfq.py --jlist 0,200,0:0,200,0 -Q 10,30,50 -c

Here is the list of inputs:

OPTIONS jobs 2

OPTIONS queues 3

OPTIONS allotments for queue 2 is 1

OPTIONS quantum length for queue 2 is 10

OPTIONS allotments for queue 1 is 1

OPTIONS quantum length for queue 1 is 30

OPTIONS allotments for queue 0 is 1

OPTIONS quantum length for queue 0 is 50

OPTIONS boost 0

OPTIONS ioTime 5

OPTIONS stayAfterIO False

OPTIONS iobump False

For each job, three defining characteristics are given:

startTime : at what time does the job enter the system

runTime : the total CPU time needed by the job to finish

ioFreq : every ioFreq time units, the job issues an I/O

(the I/O takes ioTime units to complete)

Job List:

Job 0: startTime 0 - runTime 200 - ioFreq 0

Job 1: startTime 0 - runTime 200 - ioFreq 0

Execution Trace:

[time 0] JOB BEGINS by JOB 0

[time 0] JOB BEGINS by JOB 1

[time 0] Run JOB 0 at PRIORITY 2 [TICKS 9 ALLOT 1 TIME 199 (of 200)]

[time 1] Run JOB 0 at PRIORITY 2 [TICKS 8 ALLOT 1 TIME 198 (of 200)]

[time 2] Run JOB 0 at PRIORITY 2 [TICKS 7 ALLOT 1 TIME 197 (of 200)]

[time 3] Run JOB 0 at PRIORITY 2 [TICKS 6 ALLOT 1 TIME 196 (of 200)]

[time 4] Run JOB 0 at PRIORITY 2 [TICKS 5 ALLOT 1 TIME 195 (of 200)]

[time 5] Run JOB 0 at PRIORITY 2 [TICKS 4 ALLOT 1 TIME 194 (of 200)]

[time 6] Run JOB 0 at PRIORITY 2 [TICKS 3 ALLOT 1 TIME 193 (of 200)]
[time 7] Run JOB 0 at PRIORITY 2 [TICKS 2 ALLOT 1 TIME 192 (of 200)]
[time 8] Run JOB 0 at PRIORITY 2 [TICKS 1 ALLOT 1 TIME 191 (of 200)]
[time 9] Run JOB 0 at PRIORITY 2 [TICKS 0 ALLOT 1 TIME 190 (of 200)]
[time 10] Run JOB 1 at PRIORITY 2 [TICKS 9 ALLOT 1 TIME 199 (of 200)]
[time 11] Run JOB 1 at PRIORITY 2 [TICKS 8 ALLOT 1 TIME 198 (of 200)]
[time 12] Run JOB 1 at PRIORITY 2 [TICKS 7 ALLOT 1 TIME 197 (of 200)]
[time 13] Run JOB 1 at PRIORITY 2 [TICKS 6 ALLOT 1 TIME 196 (of 200)]
[time 14] Run JOB 1 at PRIORITY 2 [TICKS 5 ALLOT 1 TIME 195 (of 200)]
[time 15] Run JOB 1 at PRIORITY 2 [TICKS 4 ALLOT 1 TIME 194 (of 200)]
[time 16] Run JOB 1 at PRIORITY 2 [TICKS 3 ALLOT 1 TIME 193 (of 200)]
[time 17] Run JOB 1 at PRIORITY 2 [TICKS 2 ALLOT 1 TIME 192 (of 200)]
[time 18] Run JOB 1 at PRIORITY 2 [TICKS 1 ALLOT 1 TIME 191 (of 200)]
[time 19] Run JOB 1 at PRIORITY 2 [TICKS 0 ALLOT 1 TIME 190 (of 200)]
[time 20] Run JOB 0 at PRIORITY 1 [TICKS 29 ALLOT 1 TIME 189 (of 200)]
[time 21] Run JOB 0 at PRIORITY 1 [TICKS 28 ALLOT 1 TIME 188 (of 200)]
[time 22] Run JOB 0 at PRIORITY 1 [TICKS 27 ALLOT 1 TIME 187 (of 200)]
[time 23] Run JOB 0 at PRIORITY 1 [TICKS 26 ALLOT 1 TIME 186 (of 200)]
[time 24] Run JOB 0 at PRIORITY 1 [TICKS 25 ALLOT 1 TIME 185 (of 200)]
[time 25] Run JOB 0 at PRIORITY 1 [TICKS 24 ALLOT 1 TIME 184 (of 200)]
[time 26] Run JOB 0 at PRIORITY 1 [TICKS 23 ALLOT 1 TIME 183 (of 200)]
[time 27] Run JOB 0 at PRIORITY 1 [TICKS 22 ALLOT 1 TIME 182 (of 200)]
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[time 391] Run JOB 1 at PRIORITY 0 [TICKS 48 ALLOT 1 TIME 8 (of 200)]

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[ time 390 ] FINISHED JOB 0
[ time 390 ] Run JOB 1 at PRIORITY 0 [ TICKS 49 ALLOT 1 TIME 9 (of 200) ]
[ time 390 ] FINISHED JOB 0
[ time 390 ] FINISHED JOB 0
[ time 390 ] Run JOB 1 at PRIORITY 0 [ TICKS 49 ALLOT 1 TIME 9 (of 200) ]
[ time 391 ] Run JOB 1 at PRIORITY 0 [ TICKS 48 ALLOT 1 TIME 8 (of 200) ]
[ time 392 ] Run JOB 1 at PRIORITY 0 [ TICKS 47 ALLOT 1 TIME 7 (of 200) ]
[ time 393 ] Run JOB 1 at PRIORITY 0 [ TICKS 46 ALLOT 1 TIME 6 (of 200) ]
[ time 394 ] Run JOB 1 at PRIORITY 0 [ TICKS 45 ALLOT 1 TIME 5 (of 200) ]
[ time 395 ] Run JOB 1 at PRIORITY 0 [ TICKS 44 ALLOT 1 TIME 4 (of 200) ]
[ time 396 ] Run JOB 1 at PRIORITY 0 [ TICKS 43 ALLOT 1 TIME 3 (of 200) ]
[ time 397 ] Run JOB 1 at PRIORITY 0 [ TICKS 42 ALLOT 1 TIME 2 (of 200) ]
[ time 398 ] Run JOB 1 at PRIORITY 0 [ TICKS 41 ALLOT 1 TIME 1 (of 200) ]
[ time 399 ] Run JOB 1 at PRIORITY 0 [ TICKS 40 ALLOT 1 TIME 0 (of 200) ]
[ time 400 ] FINISHED JOB 1
```

Final statistics:

Job 0: startTime 0 - response 0 - turnaround 390

Job 1: startTime 0 - response 10 - turnaround 400

Avg 1: startTime n/a - response 5.00 - turnaround 395.00

4.a

To do fairness in a round robin scheduler, we could find which job finishes first and make that the first job. Then, we could calculate the Fairness Metric by dividing that by the time the second job completes. Lastly, we could do that consecutively and add the Fairness Metric together and divide by n or the amount of job\Fairness Metrics added to find the fairness.

4.b,c,d

Could not get code to compile correctly despite many, many attempts.