

Subject: Lecture on Operating System Lecture Exercise 4.2

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Date: Fri, 24 Nov 2006 18:07:31 +0900

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問題4.2

Process CPU time Priority

```
1 10 3
2 1 1
3 2 3
4 1 4
5 5 2
```

waiting time の average を W , turnaround time の average を T と置く。

・FIFOの場合

```
| P1 | P2 | P3 | P4 | P5 |
0 10 11 13 14 19
```

$$W = (0+10+11+13+14) / 5 = 9.6$$

$$T = (10+11+13+14+19) / 5 = 13.4$$

・SJFの場合

```
| P2 | P4 | P3 | P5 | P1 |
0 1 2 4 9 19
```

$$W = (9+0+2+1+4) / 5 = 3.2$$

$$T = (19+1+4+2+9) / 5 = 7.0$$

・Priorityの場合

```
| P2 | P5 | P1 | P3 | P4 |
0 1 6 16 18 19
```

$$W = (6+0+16+18+1) / 5 = 8.2$$

$$T = (16+1+18+19+6) / 5 = 12.0$$

・RR(quantum=12)の場合

```
| P2 | P5 | P1 | P3 | P4 |
0 1 6 16 18 19
```

$$W = (6+0+16+18+1) / 5 = 8.2$$

$$T = (16+1+18+19+6) / 5 = 12.0$$

・RR(quantum=6)の場合

```
| P2 | P5 | P1 | P3 | P4 | P1 |
0 1 6 12 14 15 19
```

$$W = (15+0+12+14+1) / 5 = 8.4$$

$$T = (19+1+14+15+6) / 5 = 11.0$$

・RR(quantum=1)の場合

```
| P2 | P5 | P1 | P3 | P4 | P5 | P1 | P3 | P5 | P1 | P5 | P1 | P5 | P1 | P1 | P1 | P1 | P1 |
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
```

$$W = (9+0+6+4+8) / 5 = 5.4$$

$$T = (19+1+8+5+13) / 5 = 9.2$$

以上の結果より今回の場合は、SJFが一番高速なScheduling Algorithmとなった。