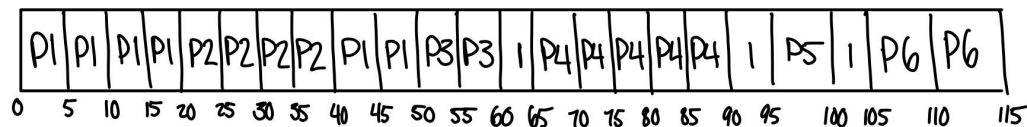


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Homework 2

1. Including the initial parent process, there are 16 processes that are created by the program.
2. $A = 0$, $B = 2603$, $C = 2603$, and $D = 2600$
3. At Line X: CHID:0CHID:-1CHID:-4CHID:-9CHID:-16
At Line Y: PARENT:0PARENT:2PARENT:3PARENT:4
4. I/O-bound programs have the property of performing only a small amount of computation before performing I/O. Such programs typically do not use up their entire CPU quantum. CPU-bound programs, on the other hand, use their entire quantum without performing any blocking I/O operations. Consequently, one could make better use of the computer's resources by giving higher priority to I/O-bound programs and allow them to executed ahead of the CPU-bound programs.
5. The regressive round robin scheduler **will favor the CPU-bound processes**. Because CPU-bound processes when uses its entire time quantum, they get additionally 10 milliseconds as time quantum as well as their priority gets boosted.
The regressive round robin scheduler **will not favor the I/O-bound processes**. Because these processes can be blocked for I/O before consuming the full quota of time quantum, and their priority will not get effected, its mean priority will be same as before.
6. A)



B) Turnaround Time = Completion time-Starting time

$$P1 = 20$$

$$P2 = 85-25=60$$

$$P3 = 90 - 35=55$$

$$P4 = 80-65=15$$

$$P5 = 110-100=10$$

$$P6 = 120-110=10$$

C) Waiting time:

$$P1 = 0$$

$$P2 = 10 + (80 - 55) = 35$$

$$P3 = 5 + 10 + (85 - 65) = 35$$

$$P4 = 5$$

$$P5 = 0$$

$$P6 = 5$$

D) CPU Utilization rate

$$\text{Idle time} = 15$$

$$\text{CPU Utilization rate} = (105/120) * 100 = 87.5\%$$

7. A) 5 unique processes are created
B) 2 unique threads are created
8. The output at line C = 27
The output at line P = 0