

New York University
Tandon School of Engineering
Department of Electrical & Computer Engineering

Introduction to Operating Systems (CS-GY6233)
Fall 2020

Assignment 8
(10 points)

- 1) Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P_1	4	1
P_2	3	2
P_3	9	1
P_4	5	4
P_5	2	3

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5 , all at time 0.

- (2 points) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: SJF and RR (quantum = 2).
 - (1 point) What is the turnaround time of each process for each of the scheduling algorithms in part a?
 - (1 point) What is the waiting time of each process for each of these scheduling algorithms?
 - (1 point) Which of the algorithms results in the minimum average waiting time (over all processes)?
- 2) Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving a request at cylinder 2,150, and the previous request was at cylinder 1,805. The queue of pending requests, in FIFO order, is:

2074, 1514, 230, 2400, 567, 1218, 457, 1780, 4760, 3380

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms?

- (2 point) SCAN
 - (2 point) C-LOOK
- 3) (1 point) Reruns HW 5 (on Linux) but set the contention scope to `PTHREAD_SCOPE_PROCESS`. Did the function call to set the contention scope succeed? Does Linux allow process contention scope?

What to hand in (using NYU Classes):

- A source file named **“lab8.c”** (with appropriate comments). Do not attach project or make files.
- A .pdf file named **“lab8.pdf”**, containing:

- Answers to HW questions.
- Screen shot(s) of your terminal window showing the current directory, the command used to compile your program and the command used to run your program
- The output plots of your program (if any)

RULES:

- You shall **use kernel version 4.x.x or above**. You shall not use kernel version 3.x.x.
- You may consult with other students about GENERAL concepts or methods, but copying code (or code fragments) or algorithms is NOT ALLOWED and is considered cheating (whether copied from other students, the internet or any other source).
- If you are having trouble, please ask your teaching assistant for help.
- You must submit your assignment prior to the deadline.