

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

Introduction to Operating Systems (CS-GY6233)
Spring 2022

Assignment 9
(10 points)

- 1) (5 points) Consider the following set of processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time	Priority
P_1	7	4
P_2	12	2
P_3	5	1
P_4	3	3
P_5	9	1

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) (5 points) Suppose that a disk drive has 5,000 cylinders, numbered 0 to 4,999. The drive is currently serving a request at cylinder 1899, and the previous request was at cylinder 1,805. The queue of pending requests, in FIFO order, is:

2022, 1125, 750, 2342, 870, 3100, 4089, 1733, 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?

- (2.5 point) C-SCAN
- (2.5 point) LOOK

Submission file structure:

Please submit a **single .zip file** named **[Your Netid]_lab#.zip**. It shall have the following structure (replace # with the actual assignment number):

└─ [Your Netid] hw# (Single folder includes all your submissions)
 └─ lab#_1.c (Source code for problem 1)

- |— lab#_2a.c (Source code for problem 2a, and so on)
- |— lab#_1.h (Source code header file, if any)
- |— Makefile (makefile used to build your program, if any)
- |— lab#.pdf (images + Report/answers to short-answer questions)

What to hand in (using Brightspace):

- Source files (.c or .h) with appropriate comments.
- Your Makefile if any.
- A .pdf file named “**lab#.pdf**” (# is replaced by the assignment number), containing:
 - Screen shot(s) of your terminal window showing the current directory, the command used to compile your program, the command used to run your program and the output of your program.

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.