

SONA COLLEGE OF TECHNOLOGY (AUTONOMOUS), SALEM
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
U19CS404 – OPERATING SYSTEMS LABORATORY

QUESTION SET

1. Write a C program to simulate the 'ls' command that will display all the files starting with a letter 'l'.
2. Write a C program to simulate the 'grep' command that will count the number of occurrence of a give word in a file.
3. Write a C program to display the number of words in each file in the current working directory.
4. Write a C program to list the files in the specified directory
5. Write a C program to create a specified number of child processes (given through command line) and display the pid of child processes along with its parent's pid.
6. Write a C program using fork() and execv() system calls to spawn a child and the child should print the date and the parent should print the child's pid and status
7. Write a shell script to display the content of file named sonacse.txt in the current working directory or in the subdirectories
8. Write a shell script which accepts two filenames from command line, copies the first file to the second and then displays it
9. Create a file named sample.txt with 20 lines and do the following using shell script
 - i) Count the number of words in the file.
 - ii) Display the first and last five lines of the contents
 - iii) Find the occurrence of any word
 - iv) Display the contents of the file.
10. Write a C program to create a specified number of child processes (given through command line) and display the pid of child processes along with its parent's pid
11. Write a C program to create a specified number of child processes (given through command line) and display the pid of child processes along with its parent's pid. also, child process should execute user specified program
12. Write a C program to simulate the ls and grep commands along with its variations.
13. Write a shell script to display the message "Good Morning / Good Afternoon / Good Evening" depending upon the time the user logs in.
14. Write a shell script to find the number of occurrences of a given word in a word file
15. Write a script that would take command line input a number and a word. It then prints the word n times, one word per line
16. Write a C program to find whether a file in the current working directory and a file in the immediate subdirectory exist with the same name. If so, remove the duplicate one
17. Consider the following page reference string:
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.
How many page faults would occur for the FIFO replacement algorithm? Assume three frames. Remember that all frames are initially empty, so your first unique pages will all cost one fault each. Next, consider no. of free frame to be four and then find the page fault. Will it suffer from belady's anomaly?
18. Given the rack partitions of rice storage, each of 100kg, 500kg, 200kg, 300kg and 600kg (in order) in a super market, the supervisor has to place the rice bags of 212kg, 417kg, 112kg and 426 kg (in order). Write an algorithm to help the supervisor for the effective utilization of rack partitions. Write a program for all the memory management schemes

19. The HCL Company is manufacturing the computers; the company is having the fixed stock size to hold the manufactured computers. The client can place the order if stock is not empty and company cannot manufacture the computers if the stock size full. Develop an application to handle the situation.
20. Five persons are in a queue to book railway tickets. There is only one counter and all of them arrived at 9.30 AM. The counter will be open by 10.00 AM. The processing time for each person to book the tickets are 10 minutes, 20 minutes, 5 minutes, 7 minutes and 13 minutes respectively. Identify the scheduling algorithm and write a C program for the same.
21. Six persons are in a queue to book railway tickets. There is only one counter and all of them arrived at 9.30 AM. The counter will be open by 10.00 AM. The processing time for each person to book the tickets are 10 minutes, 20 minutes, 5 minutes, 7 minutes, 2 minutes and 13 minutes respectively. The person with the minimum processing time has to be given preference. Identify the scheduling algorithm and write a C program for the same.
22. Three patients are in a Hospital to visit the doctor. The first patient is suffering from high temperature, the second patient is in unconscious state and the third patient is suffering from cold and cough. The time of each patient is 10 minutes, 30 minutes and 5 minutes respectively. Identify the scheduling algorithm and write a C program for the same.
23. Group discussion is conducted for 5 students in a campus recruitment drive. The time each student had prepared is ten minutes. But the GD conductor will be giving only 3 minutes for each student. Identify the scheduling algorithm and write a C program for the same.
24. A is the producer of random numbers and share memory buffer with B. B consumes the numbers generated by A. Help B to view numbers sent by A and print the odd numbers separately.
25. Write a C program that will simulate FCFS scheduling algorithm. For this algorithm, the program should compute waiting time, turnaround time of every job as well as the average waiting time and the average turnaround time. The average values should be consolidated in a table for easy comparison. You may use the following data to test your program. Using your program, consider that each context switching require 0.4 ms then find out the total context switching time.

Processes	Arrival time	CPU cycle(in ms)
1	0	6
2	3	2
3	5	1
4	9	7
5	10	5
6	12	3
7	14	4
8	16	5
9	17	7
10	19	2

26. Write a C program that will simulate SJF scheduling algorithm. For this algorithm, the program should compute waiting time, turnaround time of every job as well as the average waiting time and the average turnaround time. The average values should be consolidated in a table for easy comparison. You may use the following

data to test your program. Using your program, consider that each context switching require 0.4 ms then find out the total context switching time.

Processes	Arrival time	CPU cycle(in ms)
1	0	6
2	3	2
3	5	1
4	9	7
5	10	5
6	12	3
7	14	4
8	16	5
9	17	7
10	19	2

27. Write a C program that will simulate round robin scheduling algorithm. For this algorithm, the program should compute waiting time, turnaround time of every job as well as the average waiting time and the average turnaround time. The average values should be consolidated in a table for easy comparison. You may use the following data to test your program. The time quantum for round robin is 4 ms and the context switching time is zero. Using your program, consider that each context switching require 0.4 ms then find out the total context switching time.

Processes	Arrival time	CPU cycle(in ms)
1	0	6
2	3	2
3	5	1
4	9	7
5	10	5
6	12	3
7	14	4
8	16	5
9	17	7
10	19	2

28. Consider that there are three processes in ready queue and 9 free memory frame and processes has the following page reference string:

P1: 1, 2, 3, 4, 2, 1

P2: 5, 6, 2, 1, 2, 3

P3: 7, 6, 3, 2, 1, 2

And use equal partitioning method and allocate initial set of frame to all the three process. How many page faults would occur for the FIFO replacement algorithm using local replacement policy? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

29. Consider that there are three processes in ready queue and 9 free memory frame and processes has the following page reference string:

P1: 11, 12, 13, 14, 12, 11

P2: 15, 16, 12, 11, 12, 13

P3: 17, 16, 13, 12, 11, 12

And use equal partitioning method and allocate initial set of frame to all the three process. How many page faults would occur for the LRU replacement algorithm using local replacement policy? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

30. The Chip manufacturing Company is manufacturing the chips; the company is having the fixed stock size to hold the manufactured chips. The client can place the order if stock is not empty and company cannot manufacture the computers if the stock size full. Develop an application to handle the situation.