

OPERATING SYSTEM LAB (PCC CS592) ASSIGNMENTS

1. Let us consider several students write a shell program of GCD of two number i.e.gcd(a,b) using command line arguments. All the programs are stored in directory. You have to check which programs are correct and which are not. You have to prepare a list of test cases and stored it in a file. Execute each program one by one and check which one passes all test cases and which are not passes all test cases. Test cases format is

a	b	Output
2	5	1
0	3	0
5	0	Not possible
abc	5	Not possible
abc	xyz	Not possible

2. Write a shell script to find out the Zombie processes then check which processes are in sleeping state. After 60ms checks which of previous sleeping process change its states.
3. Write a C program to create a child process. Parent process send a string to child process using PIPE then child process will calculate how many, alphabet, numeric and special characters (#, &) are there?
4. Simulate the following Process scheduling algorithm using c program a)FCFS b)SJF c)SRTF and d) RR e) Priority. Take the input according to algorithm. Display process information along with waiting time and turnaround time. Calculate Average waiting time and turnaround time.
Sample Input:

Process	Arrival Time	Burst Time	Priority
P0	0	4	2
P1	1	3	3

P2	2	1	4
P3	3	5	5
P4	4	2	5

5. Create a number of threads as required for classical synchronization problem as Producer consumer, reader writer and dining philosopher problems and synchronize them using semaphore.
6. Simulate Deadlock avoidance with Banker's Algorithm find out the safe sequence also report it if deadlock cannot be avoided.

Example:

Total resources in system:-

A B C D

6 5 7 6

Available system resources are:-

A B C D

3 1 1 2

Processes (currently allocated resources):-

A B C D

P1 1 2 2 1

P2 1 0 3 3

P3 1 2 1 0

Processes (maximum resources):-

A B C D

P1 3 3 2 2

P2 1 2 3 4

P3 1 3 5 0

7. Write a C/C++ program to implement Memory Management concept using the following algorithms.

- a) Best fit
- b) Worst fit
- c) First fit

Sample: Consider the requests from processes in given order 300K, 25K, 125K, and 50K. Let there be two blocks of memory available of size 150K followed by a block size 350K.

8. Simulate the following page replacement algorithm: (i) FIFO, (ii) LRU and (iii) Optimal

Example-1 Consider page reference string 1, 3, 0, 3, 5, 6 and 3, with 3 page frames. Find number of page faults for above Algorithm.

9. Write a C/C++ program to simulate following disk scheduling algorithm
a)FCFS b)SSTF c) SCAN and d)C-SCAN.

Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The head is initially at cylinder number 53 and moving towards higher cylinder number.

10. Write a C program to create a child process. The child process execute an infinite loop so parent first suspend and resume processes using SIGSTOP , SIGCONT signals then kill the child process.