**Assignment**

MultiProcessing

1. Where are the function arguments and variables stored?

Parameter values to functions are stored on the stack as well, pushed immediately before the return address. Everything what lives on the stack (local variables, parameters etc.) can live in registers as well.

1. Where are global variables stored?

Global variables are stored in the data section. Unlike the stack, the data region does not grow or shrink — storage space for globals persists for the entire run of the program.

1. What are the resources assigned to a process?

It reports the information of processes (waiting to run, sleeping, runnable processes, etc.), memory (virtual memory information such as free, used, etc.), swap area, IO devices, system information.

1. How are processes identified?

Systematically define the set of business processes of an organization and establish clear criteria for selecting specific processes for improvement.

1. Who selects the process for execution?

The process scheduling is the activity of the process manager that handles the removal of the running process from the CPU and the selection of another process on the basis of a particular strategy.

1. What are the guiding principles used by scheduler to select a process?

The selection process is carried out by the short-term scheduler (or CPU scheduler). The scheduler selects from among the processes in memory that are ready to execute and allocates the CPU to one of them.

1. List atleast 5 scheduling algorithms

* Shortest-Job-Next (SJN) Scheduling.
* Priority Scheduling.
* Shortest Remaining Time.
* Round Robin(RR) Scheduling.
* Multiple-Level Queues Scheduling.

1. What do you mean by single and multi core?

A single-core processor is a microprocessor with a single core on its die.

A multicore processor is an integrated circuit that has two or more processor cores attached for enhanced performance and reduced power consumption.

1. How many processes can a N core CPU run parallely?

more than one processing core to execute two processes in parallel. Erlang is built for concurrency and will run concurrent solutions even with a single CPU.

1. How is a program executed internally? What are the steps involved?

The preprocessor generates an expanded source code. 2) Expanded source code is sent to compiler which compiles the code and converts it into assembly code. 3) The assembly code is sent to assembler which assembles the code and converts it into object code.

1. What are the various attributes of a process? Mention atleast one command to view process attributes

The Process attributes refer to process characteristics such as data set size, kernel scheduling priority, the number of pages of memory, and the number of page faults.

1. What are the different states of a process?

Model consists of five states i.e, running, ready, blocked, new, and exit.

1. How do we run multiple processes using a single CPU?

Single CPU systems use scheduling and can achieve multi-tasking because the time of the processor is time-shared by several processes so allowing each process to advance in parallel.

1. What do you mean context switch? When does it happen?

The Context switching is a technique or method used by the operating system to switch a process from one state to another to execute its function using CPUs in the system. A context switching helps to share a single CPU across all processes to complete its execution and store the system's tasks status.

1. What does the term concurrency and parallelism mean?

Concurrency means multiple tasks which start, run, and complete in overlapping time periods, in no specific order. Parallelism is when multiple tasks OR several parts of a unique task literally run at the same time.

1. Why do we need to assign priorities to processes?

Priorities is necessary in order to complete everything that needs to be done. Prioritization is important because it with allow you to give your attention to tasks that are important and urgent so that you can later focus on lower priority tasks.

1. Which command is used to view process status in realtime?

ps command (ps means process status)

1. Which command is used to view process tree with pid details?

tasklist command

1. Which command is used to get pid, ppid and process group id?

ps command is used to list the currently running processes and their PIDs along with some other information depends on different options.

1. Which process starts all processes in the system?

Init process is the mother (parent) of all processes on the system, it's the first program that is executed when the Linux system boots up; it manages all other processes on the system.

1. How to create a new process from within a program?

fork() creates new process from existing process. Existing process is called the parent process and the process is created newly is called child process.

1. Where the process information maintained? What is the name of the data structure used to hold process information?

The process is fully stored in memory, which is stored in a data structure called the process control block (PCB). This data structure must store all information needed for the process to be restored on the CPU so that it can resume running.

1. What happens on exit()?

exit() terminates the calling process without executing the rest code.

1. What is the difference between exit() and \_exit()? Which will cause quick exit?

The \_Exit() function in C/C++ gives normal termination of a program without performing any cleanup tasks. it does not execute functions registered with atexit.

exit() terminates the calling process without executing the rest code which is after the exit() function.

1. Does \_exit close open fds?

\_exit() does close open file descriptors, and this may cause an unknown delay, waiting for pending output to finish.

1. Does \_exit flush open streams?

exit() function shall then flush all open streams with unwritten buffered data, close all open streams.

1. What happens when you press Ctrl+C?

copy highlighted text to the clipboard.

1. What happens when you press Ctrl+Z?

reverse your last action

1. What is the use of an fd? How is it different from FILE \*?

A file descriptor (FD) is a small non-negative integer that helps in identifying an open file within a process while using input/output resources like network sockets or pipes.

1. How many fd’s are created for every process? What are they?

Linux systems limit the number of file descriptors that any one process may open to 1024 per process.

1. Name the call to get an fd for a file

fopen() and fileno() function

1. If a process creates a child sub process, how can it detect exit of a child?

The second argument of waitpid() , and then using the macros WIFEXITED and WEXITSTATUS with it.

1. Which process reaps the exit code of orphan child?

Zombie Process, The parent process reads the exit status of the child process.

1. What all does a child inherit from its parent?

A child process inherits most of its attributes, such as file descriptors, from its parent. In Unix, a child process is typically created as a copy of the parent, using the fork system call.