

FAST NUCES



Laboratory Manual

For

Operating Systems

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What is a system call?

System calls are functions provided by Linux, that are used as the interface between the user and operating systems.

C program functions:

exec

It is used to replace the currently running process with another new process. The 'exec' function families are defined in the header 'unistd.h'.

- **execve**

*int execve (const char *filename, char *const argv[], char *const envp[]);*

Parameters:

1. Takes a path name that identifies the new process image file
2. Takes an array of character pointers to NULL-terminated strings
3. Takes an array of character pointers to NULL-terminated strings. These strings constitute the environment for the new process image. Terminate the *envp* array with a NULL pointer.

If an error occurs it returns -1 else it returns nothing.

- **execlp**

*int execlp (const char *file, const char *arg, ... , NULL);*

Parameters:

1. Takes the executable binary file.
2. Takes arguments (can take more than one argument)
3. Takes NULL

If an error occurs it returns -1 else it returns nothing.

- **execvp**

*int execl (const char *file, char *const argv[]);*

Parameters:

1. Takes executable file.
2. Takes arguments (we can pass all arguments in a NULL-terminated array **argv**)

*For more information read the manual of *exec* system call*

Question # 1

Write a C program to print the content and their size as well, of the 'bin' directory using 'execve' from the 'desktop'. The content should be sorted by modification time (newest first) and also print the process id of both processes to verify the working of the *exec* function.

Question # 2

Write a C program using 'execvp' to replace one process with another. The second process should take an array of float values via the command line arguments and calculate their average. Explain verbally to the instructor the working of the function of 'execvp'. The second process should be implemented using a header file.

Question # 3

Write a C program to create a folder and a file in it by your roll number using 'execvp'. Next, use 'ps' command to demonstrate the working of your code.

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