Indian Statistical Institute  
Operating Systems  
Lab 1: Processes

Make sure man pages for system calls are installed. If you are using a Fedora based distribution, you will need to install *man-pages*; for an Ubuntu based distribution, please install *manpages-dev*.

**Man pages:** *fork(2), execve(2), exit(2), wait(2), sleep(3), pstree(1), getenv(3), setenv(3).*

1. Run *pstree* and study the output.

2. Write a (single) C program that does the following:
   (a) creates a child process;
   (b) parent process prints the child’s process ID and exits;
   (c) child executes */bin/ls* and exits.

3. Write a program to fork 10 children. Each process should print its own pid and exit.

4. Write a program that prints a) "Hello World ", and b) "Hello World\n" and then forks. Also, try using *fprintf(stderr, ...) instead of printf*. Explain the output.

5. Consider a process that forks *n* children. The children exit one by one, but not in the order in which they were created. The parent eventually calls *wait()* for each of these children. In what order are the zombie children now cleaned up: based on the order in which they were created, or based on the order in which they terminate? Write a program to empirically find the answer to this question.