

Assignment 1

Assignment 1(a):-

Write a C program to create a child process using the system call *fork()*. From the child process, display the PID and PPID and then call again the *fork()* to create a grandchild and engage him to display your roll no. From parent display the PID and PPID of all the processes and display the count of total no. of child processes created also the number of grandchild processes created. Demonstrate the use of *exit(0)* and *exit(1)*.

Hints:

* There is a system call available in the LINUX to create a child process called *fork()*. Again the *fork()* system call returns the PID of the child process to the parent process and returns the value 0 to the child process. Moreover the return value type of the *fork()* system call is *pid_t*.

* For *fork()* system call, you need a header file

```
#include<sys/types.h>
```

* To get the PID and PPID, we have two more system call *getpid()* and *getppid()* and the return types of both are *int*.

Assignment 1(b):-

Write a C program like the assignment 1(a). But here use the system call *wait()* system to synchronize the execution of parent program in your program until child process finishes. Now write a function to print to find out who is logging in the local machine that is partially equivalent to the cmd "w" or "who" and engage the grandchild to print the output into the stdout.

Hints:

*For *wait()* system call, you need a header file *#include<sys/wait.h>*

* Learn to see */var/run/utmp*

* Source code for "*struct utmp*" is available in *utmp.h*. You need to print the member variable "*ut_user*" for the logged in user. You can use command "*man utmp*" to see the manual.

Assignment 1(c):-

Write a C program like the assignment 1(b) and overlay a user designed program into the address space of the child process using *execv()* system call. Again use *wait()* system call to synchronize the execution of parent process in your program until child process finishes. Here use the macro *WIFEXITED* to capture the returned status of the child in parent process. Also demonstrate the use of argument vector to print the program name by the child process.