Processing Environment

Subject:- Unix Operating System

System Lab Class :- TYIT

Name **PRN**

Aditi Sudhir Ghate **2020BTEIT00044**

Assignment No - 1e

Title-Write the program to use fork/vfork system call and assign process to work as a shell. OR Read commands from standard input and execute them.

Objectives –

1. To learn about Processing Environment.
2. To know the difference between fork/vfork and various execs variations.
3. Use of system call to write effective programs.

Theory-

Syntax-

#include<stdlib.h>
int system(const char *command);

Description:

system() executes a command specified in command by calling /bin/sh -c command, and returns after the command has been completed. During execution of the command, SIGCHLD will be blocked, and SIGINT and SIGQUIT will be ignored.

Return Value:

The value returned is -1 on error (e.g., fork(2) failed), and the return status of the command otherwise. This latter return status is in the format specified in wait(2). Thus, the exit code of the command will be WEXITSTATUS(status). In case /bin/sh could not be executed, the exit status will be that of a command that does exit(127). If the value of command is NULL, system() returns nonzero if the shell is available, and zero if not. system() does not affect the wait status of any other children

Program-

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
char str[256], buf[256];
printf("Enter command ");
scanf("%s",str);
sprintf(buf, "/bin/sh -c %s", str);
system(buf);
return 0;
}
```

Output-

```
aditi@aditi-Lenovo-ideapad-330S-14IKB-U:~/ADnOR/Assignments/1E$ gcc 2E.c
cc1: fatal error: 2E.c: No such file or directory
compilation terminated.
aditi@aditi-Lenovo-ideapad-330S-14IKB-U:~/ADnOR/Assignments/1E$ gcc 1E.c
1E.c: In function ‘main’:
1E.c:8:26: warning: ‘%s’ directive writing up to 255 bytes into a region of size 245 [-Wformat-overflow=]
    8 | sprintf(buf, "/bin/sh -c %s", str);
      |                          ^~   ~~~
1E.c:8:1: note: ‘sprintf’ output between 12 and 267 bytes into a destination of size 256
    8 | sprintf(buf, "/bin/sh -c %s", str);
      | ^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
aditi@aditi-Lenovo-ideapad-330S-14IKB-U:~/ADnOR/Assignments/1E$ gcc 1E.c
1E.c: In function ‘main’:
1E.c:8:26: warning: ‘%s’ directive writing up to 255 bytes into a region of size 245 [-Wformat-overflow=]
    8 | sprintf(buf, "/bin/sh -c %s", str);
      |                          ^~   ~~~
1E.c:8:1: note: ‘sprintf’ output between 12 and 267 bytes into a destination of size 256
    8 | sprintf(buf, "/bin/sh -c %s", str);
      | ^~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
aditi@aditi-Lenovo-ideapad-330S-14IKB-U:~/ADnOR/Assignments/1E$ ./a.out
Enter command hostnamectl
 Static hostname: aditi-Lenovo-ideapad-330S-14IKB-U
       Icon name: computer
      Machine ID: 755846b0467d4610a29921729bc5522a
         Boot ID: 677265e166d74e97982b95f6c4fb9353
Operating System: Ubuntu 22.10
          Kernel: Linux 5.19.0-29-generic
    Architecture: x86-64
 Hardware Vendor: Lenovo
  Hardware Model: Lenovo ideapad 330S-14IKB U
Firmware Version: 7SCN17WW
```

Conclusion:

system() can be used to perform various shell commands when the commands are read from standard input. The output of shell is printed.

References:

www.tutorialspoint.com/unix_system_calls/