EX. NO:5
DATE: 12.02.2025

System Calls Programming

Aim:

To experiment system calls using fork(), execlp() and pid() functions.

Algorithm:

1. Start
o Include the required header files (stdio.h and stdlib.h).
2. Variable Declaration
o Declare an integer variable pid to hold the process ID.
3. Create a Process
o Call the fork() function to create a new process. Store the return value in the pid variable:
If fork() returns:
-1: Forking failed (child process not created).
0: Process is the child process.
Positive integer: Process is the parent process.

4. Print Statement Executed Twice
o Print the statement:
scss
Copy code
THIS LINE EXECUTED TWICE
(This line is executed by both parent and child processes after fork()).

5. Check for Process Creation Failure
o If pid == -1:
Print:
Copy code
CHILD PROCESS NOT CREATED
Exit the program using exit(0).

6. Child Process Execution
o If pid == 0 (child process):
Print:
Process ID of the child process using getpid().
Parent process ID of the child process using getppid().

7. Parent Process Execution

o If pid > 0 (parent process):
Print:
Process ID of the parent process using getpid().
Parent's parent process ID using getppid().

8. Final Print Statement
o Print the statement:
objectivec

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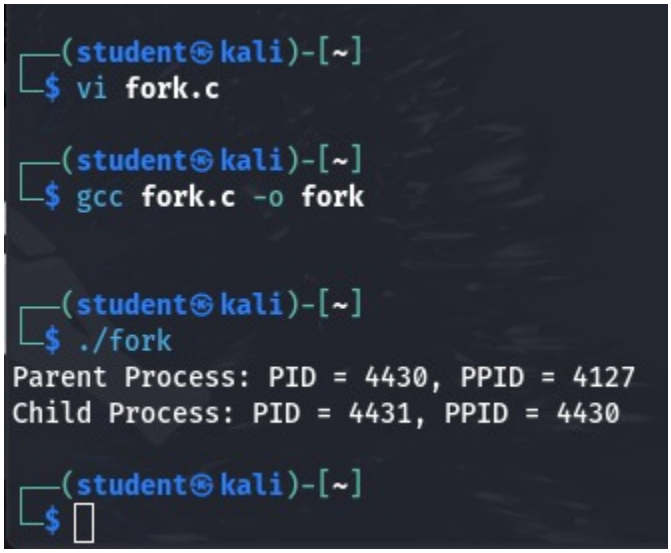
Copy code
IT CAN BE EXECUTED TWICE
(This line is executed by both parent and child processes).

9. End

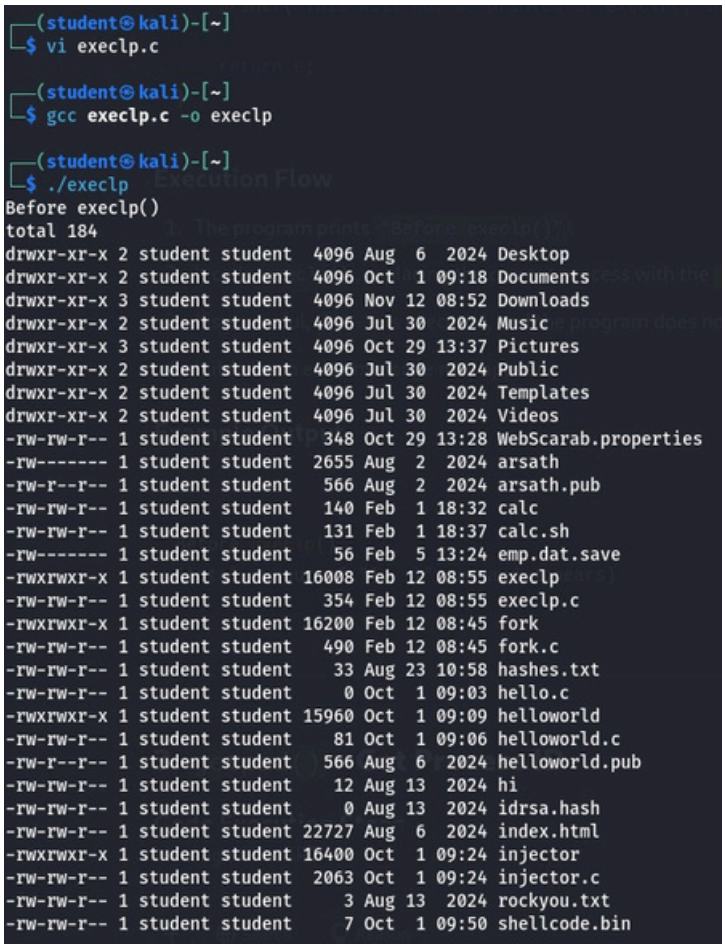
Program:
fork()




```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
int main() {
        int pid = fork();
        if (pid == -1) {
        printf("CHILD PROCESS NOT CREATED\n");
        exit(0);
```

```
        }
        if (pid == 0) {
        printf("Child Process: PID = %d, PPID = %d\n", getpid(), getppid());
        } else {
        printf("Parent Process: PID = %d, PPID = %d\n", getpid(), getppid());
        }
        return 0;
}
```

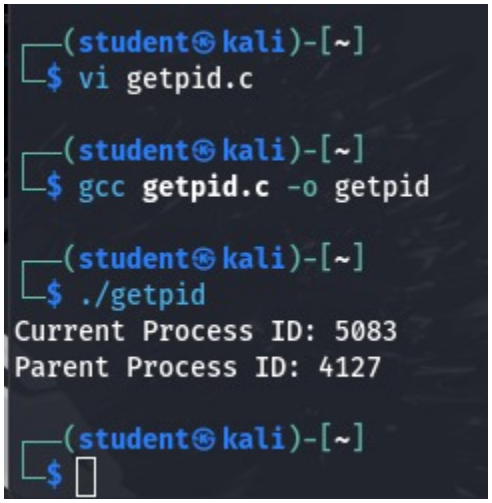
execlp()




```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
int main() {
        printf("Before execlp()\n"); // Step 1: Print initial message
        execlp("ls", "ls", "-l", NULL); // Step 2: Execute "ls -l" command
        printf("This will not be printed if execlp() succeeds.\n"); // Step 3: This line is never
executed if execlp() works
```

```
        return 0;
}
```

getpid()




```
#include <stdio.h>
#include <unistd.h>
int main() {
        printf("Current Process ID: %d\n", getpid()); // Step 1: Get current PID
        printf("Parent Process ID: %d\n", getppid()); // Step 2: Get parent process ID
        return 0;
}
```

opendir() and readdir()

```
┌──(student㉿kali)-[~]
└─$ vi dir.c

┌──(student㉿kali)-[~]
└─$ gcc dir.c -o dir

┌──(student㉿kali)-[~]
└─$ ./dir
.msf4
shellcode.bin
index.html
Videos
Downloads
.java
.zsh_history
dir.c
.bash_logout
.viminfo
hashes.txt
injector.c
Desktop
.ssh
WebScarab.properties
Templates
Documents
Music
getpid
.bashrc.original
calc.sh
.pki
emp.dat.save
execlp
fork
Public
helloworld
calc
.mozilla
getpid.c
.face.icon
.profile
arsath
helloworld.pub
dir
arsath.pub
.keystore
.face
.
injector
.john
..
.BurpSuite
.config
helloworld.c
.zshrc
.sudo_as_admin_successful
hello.c
execlp.c
hi
rockyou.txt
.cache
idrsa.hash
fork.c
.local
Pictures
.bashrc
```

```
#include <stdio.h>
#include <stdlib.h>
```

```
#include <dirent.h>

int main() {
        struct dirent *de;
        DIR *dr = opendir("."); // Step 1: Open current directory
        if (dr == NULL) { // Step 2: Check for failure
        printf("Could not open current directory\n");
        return 0;
        }
        while ((de = readdir(dr)) != NULL) // Step 3: Read directory entries
        printf("%s\n", de->d_name);
        closedir(dr); // Step 4: Close directory
        return 0;
}
```

Result:

Hence, system calls are executed successfully.