Ex. No.: 5

Date: 15|2|25

System Calls Programming

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

Algorithm:

1. **Start**
   - ○ Include the required header files (stdio.h and stdlib.h).
2. **Variable Declaration**
   - ○ Declare an integer variable pid to hold the process ID.
3. **Create a Process**
   - ○ 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**
   - ○ 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**
   - ○ If pid == -1:
     - ▪ Print:

       Copy code
       CHILD PROCESS NOT CREATED

     - ▪ Exit the program using exit(0).
6. **Child Process Execution**
   - ○ 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**
   - ○ 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**
   - ○ Print the statement:

     objectivec

Copy code
IT CAN BE EXECUTED TWICE

(This line is executed by both parent and child processes).

9. **End**

Program:

```c
#include <stdio.h>
#include <stdlib.h>        #include <unistd.h>
int main ()
{
    int pid;
    pid = fork();
    printf("\n THIS LINE EXECUTED TWICE");
    if (pid == -1)
    {
        printf("\n CHILD PROCESS NOT CREATED \n");
        exit(0);
    }
    if (pid == 0)
    {
        printf("\n I AM CHILD PROCESS AND MY ID IS:%d\n", getpid());
        printf("\n THE CHILD PARENT PROCESS ID IS:%d\n", getppid());
    }
    else
    {
        printf("\n I AM PARENT PROCESS AND MY ID IS:%d\n", getpid());
        printf("\n THE PARENTS PARENT PROCESS ID IS:%d\n", getppid());
    }
    printf("\n IT CAN BE EXECUTED TWICE");
    printf("\n");                33
}
```

Output:

THIS LINE EXECUTED TWICE

I AM PARENT PROCESS AND MY ID IS: 2150

THE PARENTS PARENT PROCESS ID IS: 1781

IT CAN BE EXECUTED TWICE

THIS LINE EXECUTED TWICE

I AM CHILD PROCESS AND MY ID IS: 2151

THE CHILD PARENT PROCESS ID IS: 1

IT CAN BE EXECUTED TWICE

Result:

Thus the C program for system calls programming is executed successfully.