Ex. No: 5

System Calls Programming

AIM:

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

ALGORITHM:

1. **Start**
2. **Include Header Files**
    - o Include stdio.h for input/output functions
    - o Include stdlib.h for general utility functions
3. **Variable Declaration**
    - o Declare an integer variable pid to store the process ID returned by fork()
4. **Create a New Process**
    - o Call the fork() function and assign its return value to pid
        - ▪ If fork() returns:
            - ▪ -1: Process creation failed
            - ▪ 0: This is the **child** process
            - ▪ A positive integer: This is the **parent** process
5. **Print Statement Executed by Both Processes**
    - o Print: "THIS LINE EXECUTED TWICE"
6. **Check for Process Creation Failure**
    - o If pid == -1:
        - ▪ Print: "CHILD PROCESS NOT CREATED"
        - ▪ Exit the program using exit(0)
7. **Child Process Execution Block**
    - o If pid == 0:
        - ▪ Print:
            - ▪ "Process ID of child: " followed by getpid()
            - ▪ "Parent Process ID of child: " followed by getppid()
8. **Parent Process Execution Block**
    - o If pid > 0:
        - ▪ Print:
            - ▪ "Process ID of parent: " followed by getpid()

        - "Parent’s Parent Process ID: " followed by getppid()

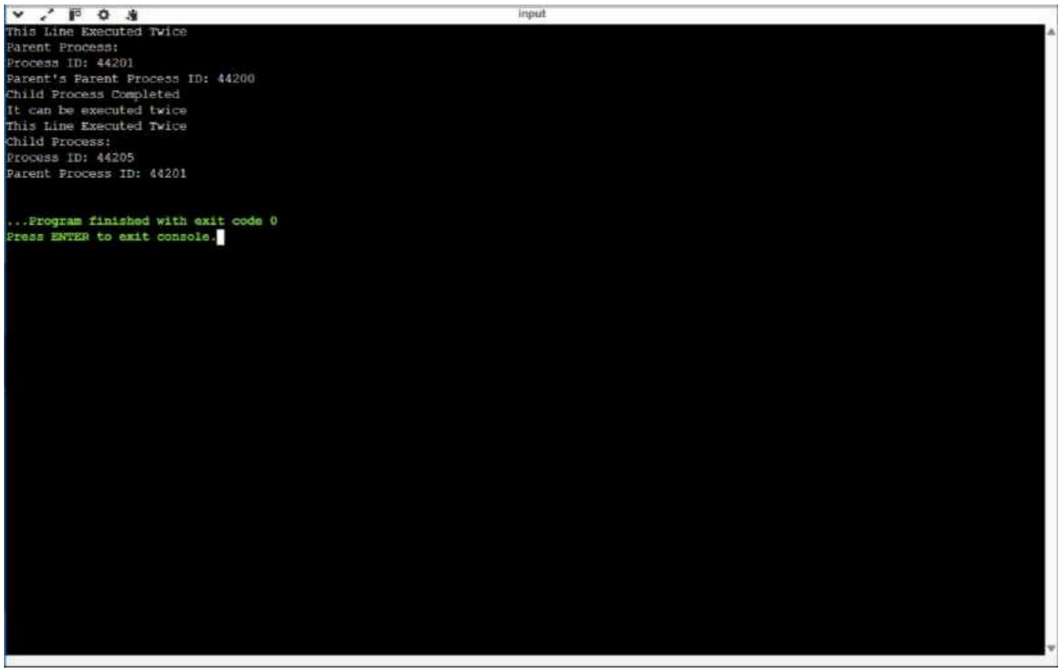
9. **Final Print Statement (Executed by Both Processes)**

```
            o   Print: objectives
IT CAN BE EXECUTED TWICE
  10. End
```

PROGRAM:

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

int main() {
       int pid;
       pid = fork();
       printf("This Line Executed Twice\n");

       if (pid < 0) {
           printf("Child Process Not Created\n");
          exit(1);
      }

      if (pid == 0) {
          printf("Child Process:\n");
          printf("Process ID: %d\n", getpid());
          printf("Parent Process ID: %d\n",
          getppid()); execlp("/bin/ls", "ls", NULL);
          perror("execlp failed");
          exit(1);
        } else { // Parent process
                  printf("Parent Process:\n");
                  printf("Process ID: %d\n", getpid());
                  printf("Parent's Parent Process ID: %d\n", getppid());
                  printf("Child Process Completed\n");
         }

         printf("It can be executed twice\n");

         return 0;
}
```

OUTPUT:



```
This Line Executed Twice
Parent Process:
Process ID: 44201
Parent's Parent Process ID: 44200
Child Process Completed
It can be executed twice
This Line Executed Twice
Child Process:
Process ID: 44205
Parent Process ID: 44201


...Program finished with exit code 0
Press ENTER to exit console.
```

RESULT:

Thus, the Program is implemented using fork(),execlp() and pid() Function.