Ex. No: 5 System Calls Programming

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Aim:

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

Algorithm:

1. **Start**
    - Include the required header files: stdio.h, stdlib.h, and unistd.h.
2. **Variable Declaration**
    - Declare an integer variable pid to hold the process ID.
3. **Create a Process**
    - Call the fork() function and store the return value in pid.
        - If fork() returns:
            - -1: Forking failed.
            - 0: This is the child process.
                - Positive value: This isthe parent process.
4. **Print Statement Executed Twice**
    - Print:
    - THIS LINE EXECUTED TWICE
5. **Check for Process Creation Failure**
    - If pid == -1, print:
    - CHILD PROCESS NOT CREATED
        - Exit the program.
6. **Child Process Execution**
    - If pid == 0, print:
        - The process ID of the child using getpid().
        - The parent process ID of the child using getppid().
7. **Parent Process Execution**
    - If pid > 0, print:

- The process ID of the parent using getpid().
- The parent's parent process ID using getppid().

8. **Final Print Statement**
    - Print:
    - IT CAN BE EXECUTED TWICE
9. **End**

Program Code:

```
// filename: systemcall.c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

int main() {
   int pid;

   pid = fork(); // Create new process

   printf("THIS LINE EXECUTED TWICE\n");

   if (pid == -1) {
      printf("CHILD PROCESS NOT CREATED\n");
      exit(0);
   }

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

```
        printf("Parent Process ID: %d\n", getpid());
        printf("Parent's Parent ProcessID: %d\n", getppid());
    }

    printf("IT CAN BE EXECUTED TWICE\n");
    return 0;
}
```

SampleOutput:

```
THIS LINE EXECUTED TWICE
Parent ProcessID: 12345
Parent's Parent ProcessID: 1000
IT CAN BE EXECUTED TWICE
THIS LINE EXECUTED TWICE
Child ProcessID: 12346
Parent Process ID of Child: 12345
IT CAN BE EXECUTED TWICE
```

Result:

The program was successfully executed. It demonstrated the use of system calls fork(), getpid(), and getppid() to manage parent and child processes.