

Ex. No.: 5

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System Calls Programming

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 is the 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 o Print: o 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 Process ID: %d\n", getpid());
        printf("Parent Process ID of Child: %d\n", getppid());
    } else {
        printf("Parent Process ID: %d\n", getpid());
        printf("Parent's Parent Process ID: %d\n", getppid());
    }
}
```

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

Sample Output:

THIS LINE EXECUTED TWICE

Parent Process ID: 12345

Parent's Parent Process ID: 1000

IT CAN BE EXECUTED TWICE

THIS LINE EXECUTED TWICE

Child Process ID: 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.