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:

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9. End

Program:

```c
# include < stdio.h>
# include < stdlib.h>
int main()
{
    int pid;
    pid = fork();
    printf ("\n THIS LINE CAN 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", getpid();
    }
    else
    {
        printf ("\n I AM PARENT PROCESS AND MY ID IS %d\n", getpid();
        printf ("\n THE PARENTS PARENT PROCESS ID IS %d\n", getpid();
    }
    printf ("\n IT CAN BE EXECUTED TWICE");
    printf ("\n");
}
```

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Output:

THIS LINE CAN BE EXECUTED TWICE

I AM CHILD PROCESS AND MY ID IS 992

I AM THE CHILD PARENT PROCESS ID IS 1013

I AM PARENT PROCESS AND MY ID IS 1013

THE PARENTS PARENT PROCESS ID IS 991

THIS LINE CAN BE EXECUTED TWICE

Result:

The System Calls such as fork(), execlp() and pid() are executed successfully.

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