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Section: Gx
Subject : Operating System Lab

Qn: Write a complete C program that reads **n** numbers as command line arguments. That is, uses "**int argc**" and "**char *argv[]**" to read **d1, d2, ..., dn** when the program is executed as "**./a.out d1 d2 ... dn**". The program then creates n child processes P_1, P_2, \dots, P_n such that $P_i, 1 \leq i \leq n$, computes and prints the factorial of **dn**.

Ans:

Code:

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h> // library for fork
#include <sys/wait.h>

int factorial(int n) {
    int res = 1;
    for (int i = 2; i <= n; i++) {
        res *= i;
    }
    return res;
}

int main(int argc, char *argv[]) {
    for (int i = 1; i < argc; i++) {
        int d = atoi(argv[i]);
        if (d < 0) {
```

```

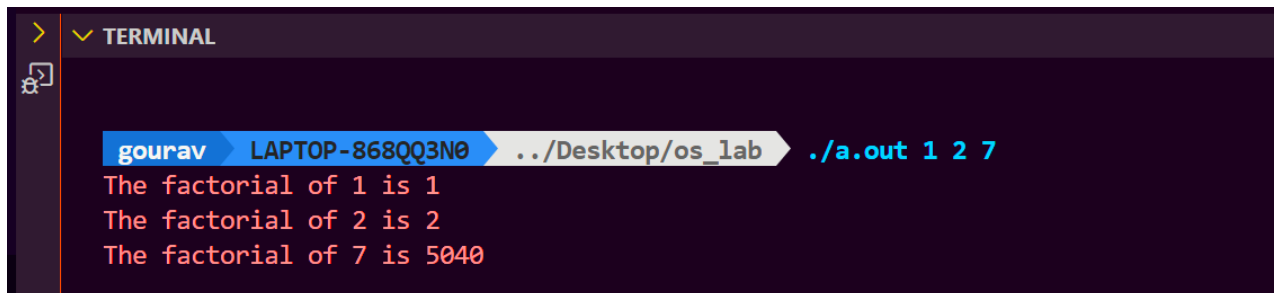
        printf("Error: Factorial of a negative number is not defined.\n");
        return 1;
    }

    pid_t pid = fork();
    if (pid == 0) {
        // child process is created here
        int f = factorial(d);
        printf("The factorial of %d is %d\n", d, f);
        return 0;
    } else if (pid > 0) {
        // parent process is created here
        wait(NULL);
    } else {
        // fork failed
        printf("Error: fork failed.\n");
        return 1;
    }
}

return 0;
}

```

Output:



A terminal window titled "TERMINAL" shows the execution of a program. The prompt is "gourav@LAPTOP-868QQ3N0: ~/Desktop/os_lab". The command executed is "./a.out 1 2 7". The output of the program is three lines: "The factorial of 1 is 1", "The factorial of 2 is 2", and "The factorial of 7 is 5040".

```

> ✓ TERMINAL
gourav@LAPTOP-868QQ3N0: ~/Desktop/os_lab$ ./a.out 1 2 7
The factorial of 1 is 1
The factorial of 2 is 2
The factorial of 7 is 5040

```