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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, ..., P_n such that P_i, $1 \leq i \leq n$, computes and prints the factorial of **dn**.

Ans:

Code:

```c
#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: