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/** @file q_factorial.c
 * @brief Submission program for Lab 04.
 * @author Mike Z.
 * @author Felipe R.
 * @author Hausi M.
 * @author Jose O.
 * @author Saasha J.
 * @author Victoria L.
 * @author Tanuj D.
 *
 */

#include <stdio.h>
#include <stdlib.h>

/**
 * Function: main
 * -----
 * @brief The main function and entry point of the program.
 *
 * @param argc The number of arguments passed to the program.
 * @param argv The list of arguments passed to the program.
 * @return int 0: No errors; 1: Errors produced.
 *
 */
int main(int argc, char *argv[])
{
    // variable to store the final answer
    double factorial = 1.0;
    int num = 0;

    // WRITE YOUR CODE TO DO COMMAND LINE INPUT CHECKING HERE (DONE)
    // Check if an argument was provided (argc must be at least 2)
    if (argc < 2)
    {
        fprintf(stderr, "Usage: %s <non-negative integer>\n", argv[0]);
        return 1;
    }

    // Takes the command line input and converts it into int.
    num = atoi(argv[1]);

    // If num is negative, factorial isn't defined in the usual sense.
    if (num < 0)
    {
        fprintf(stderr, "Error: Factorial of a negative number is undefined.\n");
        return 1;
    }

    // WRITE YOUR CODE TO DO THE FACTORIAL CALCULATIONS HERE (DONE)
    // Calculate factorial for num
    for (int i = 1; i <= num; i++)
    {
        factorial *= i;
    }

    printf("%.0f\n", factorial);
    return 0;
}

```

```

seng265@lab-04$ gcc q_factorial.c -std=c99 -o q_factorial
seng265@lab-04$ ./q_factorial
Usage: ./q_factorial <non-negative integer>
seng265@lab-04$ ./q_factorial -1
Error: Factorial of a negative number is undefined.
seng265@lab-04$ ./q_factorial 0
1
seng265@lab-04$ ./q_factorial 5
120
seng265@lab-04$ ./q_factorial 120
6689502913449123933681342530579439120523775756341546089360093784620090324126011858610763674005344861930779387322735825
049576193801545269664994272835560837966773424760538449951889918907707412713570304
seng265@lab-04$ ./q_factorial 20000
Inf
seng265@lab-04$ ./q_factorial 6
8320987112741391580056396102959641077457945541076708813599085350531187384917164032

```