Problem:

Integrate the following function numerically using **trapezoid rule** and **Simpson's 1/3 rule**.

$$I = \int_a^b x^3 e^x \, dx$$

Requirements

1. For each method, you will need a driver program and a function program.

2. Driver program will be used to:

   a. define f(x) as a function handle

   b. enter the values for **a**, **b**, and **n** (i.e. the range and the number of subdivisions between $x = a$ and $x = b$). **These numbers are to be entered using the input command.**

      i. You can assume that n is greater than 1. To use the Simpson's 1/3 rules, n should be an even number (n is the number of subdivisions).

   c. call the function program to determine the area.

   d. print out the results of the integral. Output should be as follows:

      ```
      The value of the integral from a = # to b = #
      using # equally spaced divisions is: #.#####
      ```

3. Function Program

   a. inputs to function program are: a,b, n, and your function handle

   b. output will be the area

Example

```
Enter lower limit of range: 0
Enter upper limit of range: 3
Enter number of subdivisions (must be greater than 1): 7

The value of the integral from a = 0 to b = 3
using 7 equally spaced divisions is: 263.47155
```