Day 9: Recursion 3

Objective

Today, we are learning about an algorithmic concept called recursion. Check out the Tutorial tab for learning materials and an instructional video.

Recursive Method for Calculating Factorial

$$factorial(N) = \begin{cases} 1 & N \leq 1 \\ N \times factorial(N-1) & otherwise \end{cases}$$

Function Description

Complete the factorial function in the editor below. Be sure to use recursion.

factorial has the following paramter:

- int n: an integer

Returns

- int: the factorial of n

Note: If you fail to use recursion or fail to name your recursive function factorial or Factorial, you will get a score of 0.

Input Format

A single integer, n (the argument to pass to factorial).

Constraints

- $2 \leq n \leq 12$
- Your submission must contain a recursive function named factorial.

Sample Input

```
3
```

Sample Output

```
6
```

Explanation

Consider the following steps. After the recursive calls from step 1 to 3, results are accumulated from step 3 to 1.

1. $factorial(3) = 3 \times factorial(2) = 3 \times 2 = 6$
2. $factorial(2) = 2 \times factorial(1) = 2 \times 1 = 2$
3. $factorial(1) = 1$