Day 9: Recursion 3

Objective

Today, we're learning and practicing an algorithmic concept called *Recursion*. Check out the Tutorial tab for learning materials and an instructional video!

Recursive Method for Calculating Factorial

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

Task

Write a *factorial* function that takes a positive integer, N as a parameter and prints the result of $N!$ (N factorial).

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*.

Output Format

Print a single integer denoting $N!$.

Sample Input

```
3
```

Sample Output

```
6
```

Explanation

Consider the following steps:

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

From steps 2 and 3, we can say $factorial(2) = 2 \times 1 = 2$; then when we apply the value from $factorial(2)$ to step 1, we get $factorial(3) = 3 \times 2 \times 1 = 6$. Thus, we print 6 as our answer.