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## 0.1 ClassDef Main

# 1 Class: Main

## 1.1 Overview

The Main class is a utility class that contains static methods for performing basic mathematical operations and printing messages, and it includes the main entry point for the Java application.

## 1.2 Description

The Main class serves as a container for several independent, static methods, meaning they can be called directly on the class without needing to create an instance of it. It also contains the main method, which is the standard entry point for execution of a Java program.

The class provides the following functionalities:

* **add(int a, int b)**: A simple function that takes two integer parameters, a and b, and returns their sum.
* **factorial(int n)**: This function calculates the factorial of a non-negative integer n using recursion.
  + The base case for the recursion is when n is less than or equal to 1, in which case the function returns 1.
  + For any n greater than 1, it recursively calls itself with n - 1 and multiplies the result by n.
* **greet(String name)**: A void function that takes a String parameter name and prints a formatted greeting message to the console. It does not return any value.
* **main(String[] args)**: The primary execution method for the program. It demonstrates the usage of the add, factorial, and greet methods and prints their results to the standard output.

// Example of the factorial logic  
factorial(5)  
// returns 5 \* factorial(4)  
// returns 5 \* 4 \* factorial(3)  
// returns 5 \* 4 \* 3 \* factorial(2)  
// returns 5 \* 4 \* 3 \* 2 \* factorial(1)  
// returns 5 \* 4 \* 3 \* 2 \* 1 = 120

## 1.3 Usage Notes

* All methods in this class are static, so they should be invoked directly on the Main class (e.g., Main.add(5, 10)).
* The factorial method is recursive. Providing a very large integer may lead to a StackOverflowError.
* The main method serves as a built-in example of how to use the other methods in the class.

## 1.4 Example

The following code demonstrates how to call the methods within the Main class. This is the content of the main method itself.

public static void main(String[] args) {  
 System.out.println("Sum: " + add(5, 10));  
 System.out.println("Factorial: " + factorial(5));  
 greet("Prateek");  
}

**Output:**

Sum: 15  
Factorial: 120  
Hello, Prateek!