School Grades

School teachers of grades 1 - 9 have to prepare their students' annual progress and achievement report.

Write a program that helps teachers accomplish this task.

Grades in School

```java
public class Grade1Average {
    Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int marksOfSubject = 0;
        int averageMarks = 0;
        int totalMarks = 0;
        // Enter the marks of each student in the semester
        System.out.println("Enter the marks of 5 subjects in semester 1 : ");
        for(int i = 0;i<5;i++)
        {
            marksOfSubject = sc.nextInt();
            //Marks in each subject must not be less than 0 or greater than 100
            if(marksOfSubject<0 || marksOfSubject>100)
            {
                System.out.println("Marks is less than 0 or greater than 100, Enter the mark again");
                marksOfSubject = sc.nextInt();
                continue;
            }

            // calculate the total marks
            totalMarks = totalMarks + marksOfSubject;
        }
        // calculate the average marks
        averageMarks = totalMarks/5;
        System.out.println("The total marks is : "+totalMarks);
        System.out.println("The average marks are : " + averageMarks);
        // Categorize the student based on grade obtained
        if(averageMarks>80)
            System.out.println("Grade is A");
        else if(averageMarks>=79 || averageMarks<=60)
            System.out.println("Grade is B");
        else if(averageMarks>=59 || averageMarks<=50)
            System.out.println("Grade is C");
        else if(averageMarks>=49 && averageMarks<=35)
            System.out.println("Grade is D");
        else
            System.out.println("Grade is F");

    }
}
```

Think and Tell

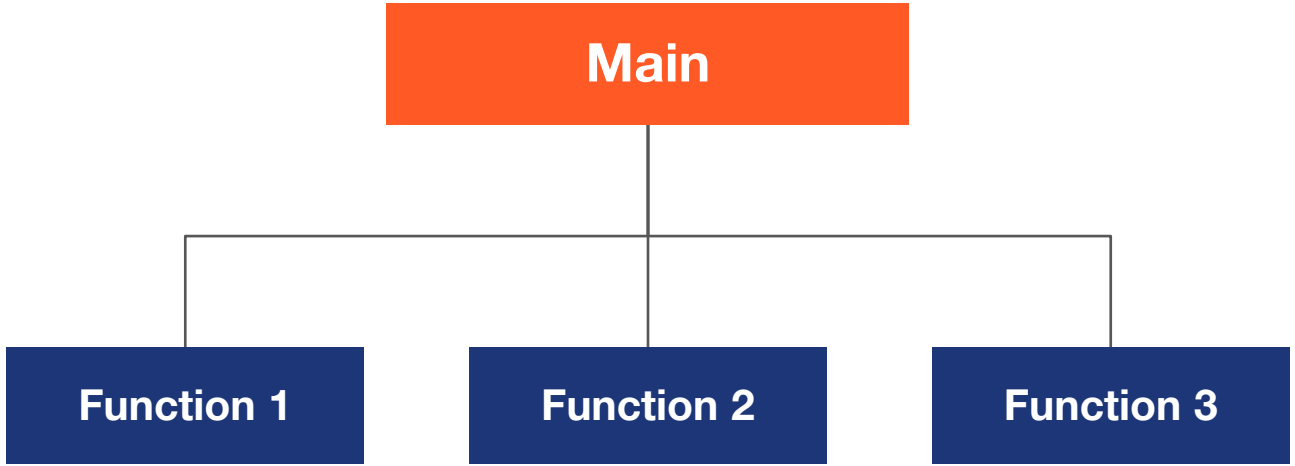
- How can this code be optimized?
- Can we separate the functionality?
- Is it possible to reuse this code in another application?

Implementing Modular Programming Using Functions

Learning Objectives

- Implement modular programming using functions
- Define functions with return type and parameters
- Make function calls from other functions
- Use static functions

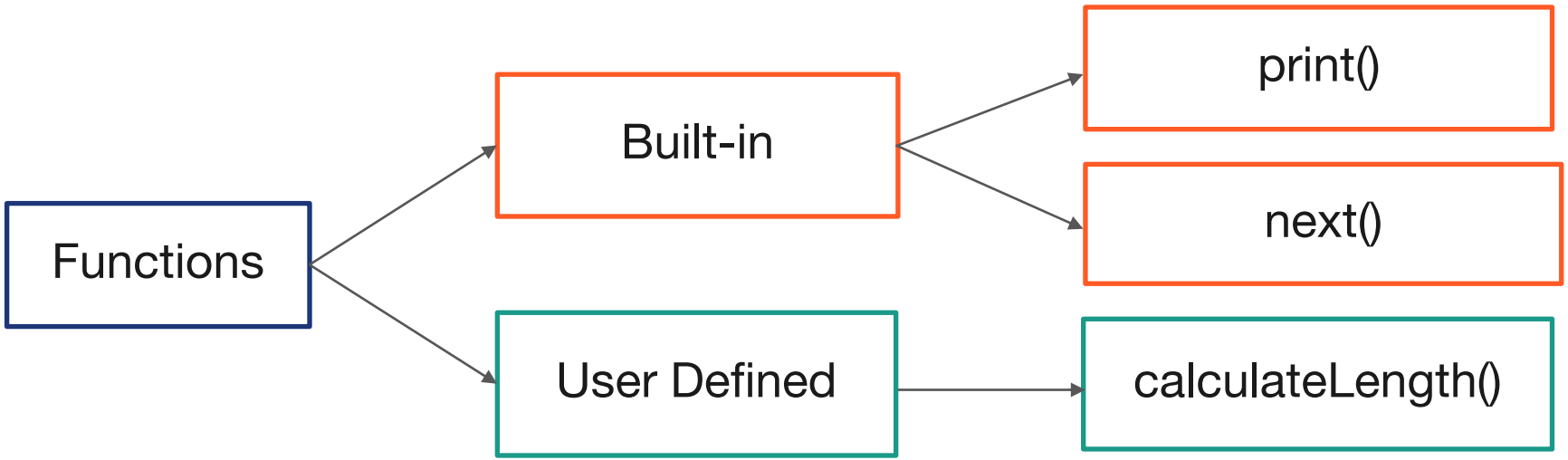
What Is Modular Programming?



What Is a Function ?

A function is a block of reusable code that helps in performing a specific action.

Types of Functions in Java



Function Structure

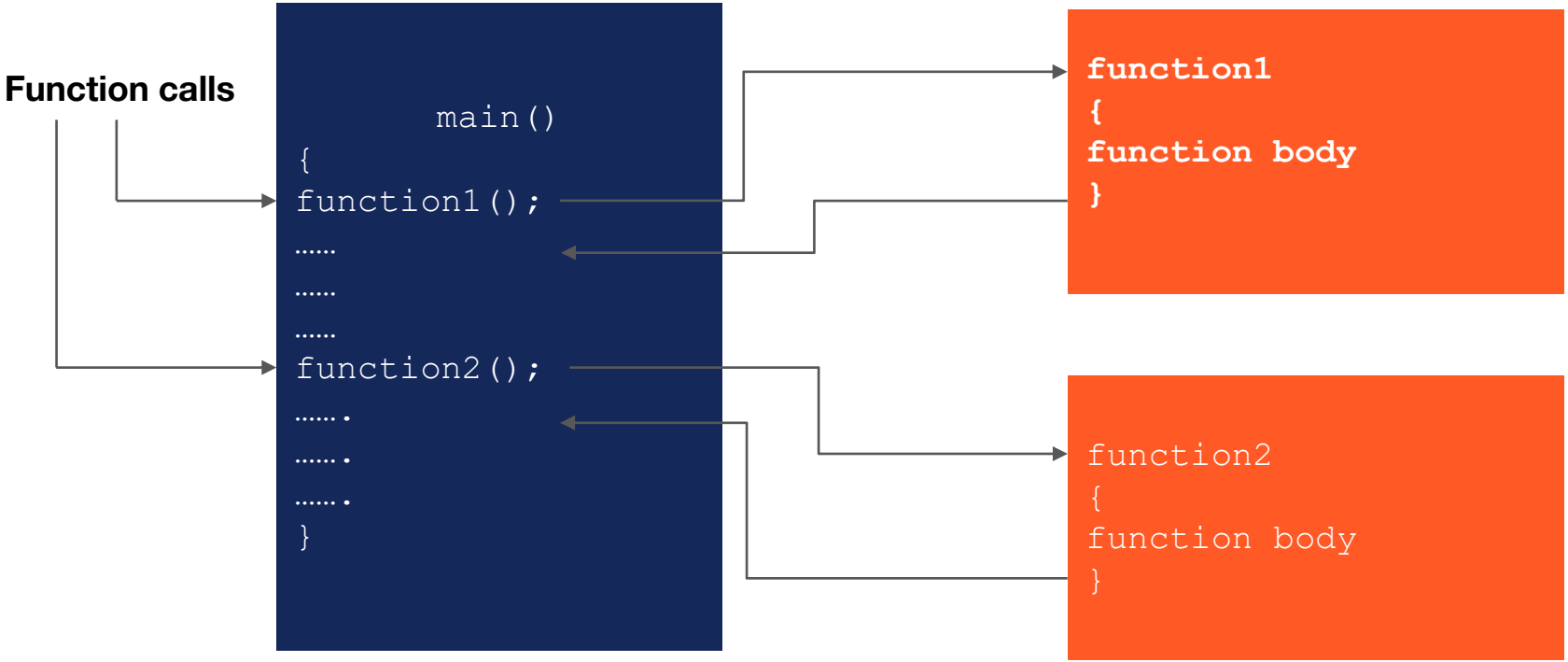
A function is called a method in Java.

```
<modifier> <return type> <method name>(<parameter list>)
{

<method body>

}
```

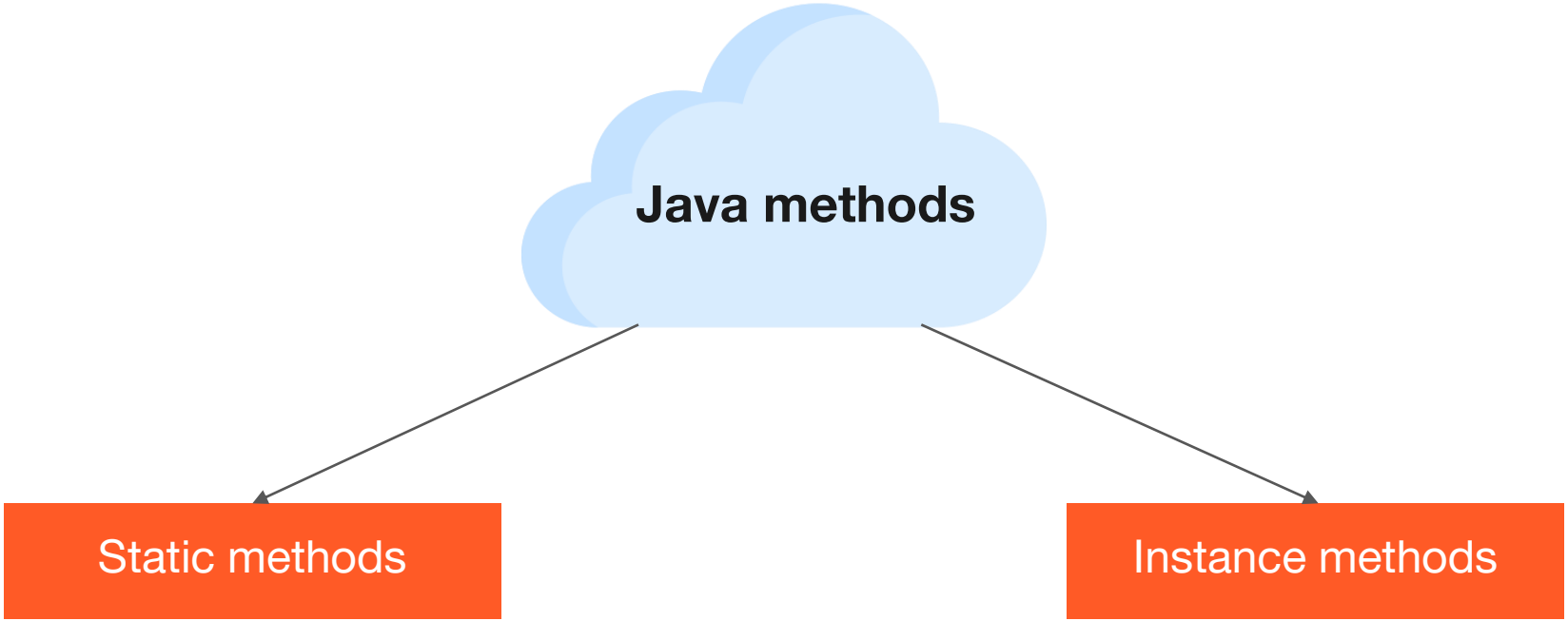
What Is a Function Call?



Interactive Demo

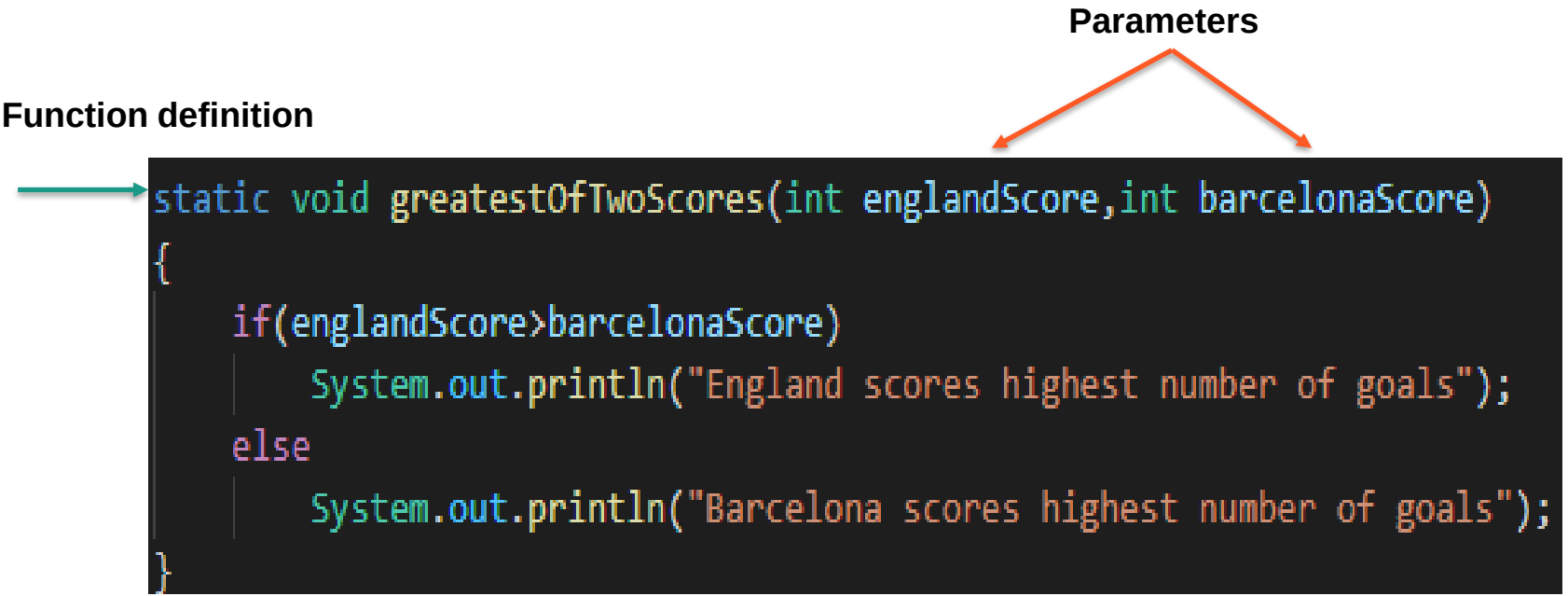
Write a program that greets students with a “Good Morning” message when they enter the class.

Methods - Category

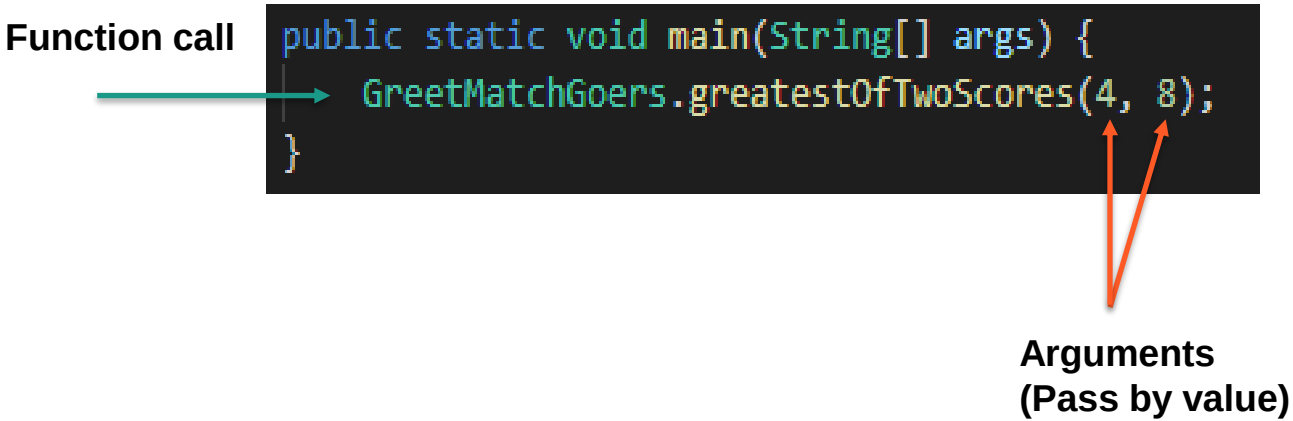


Function Parameters

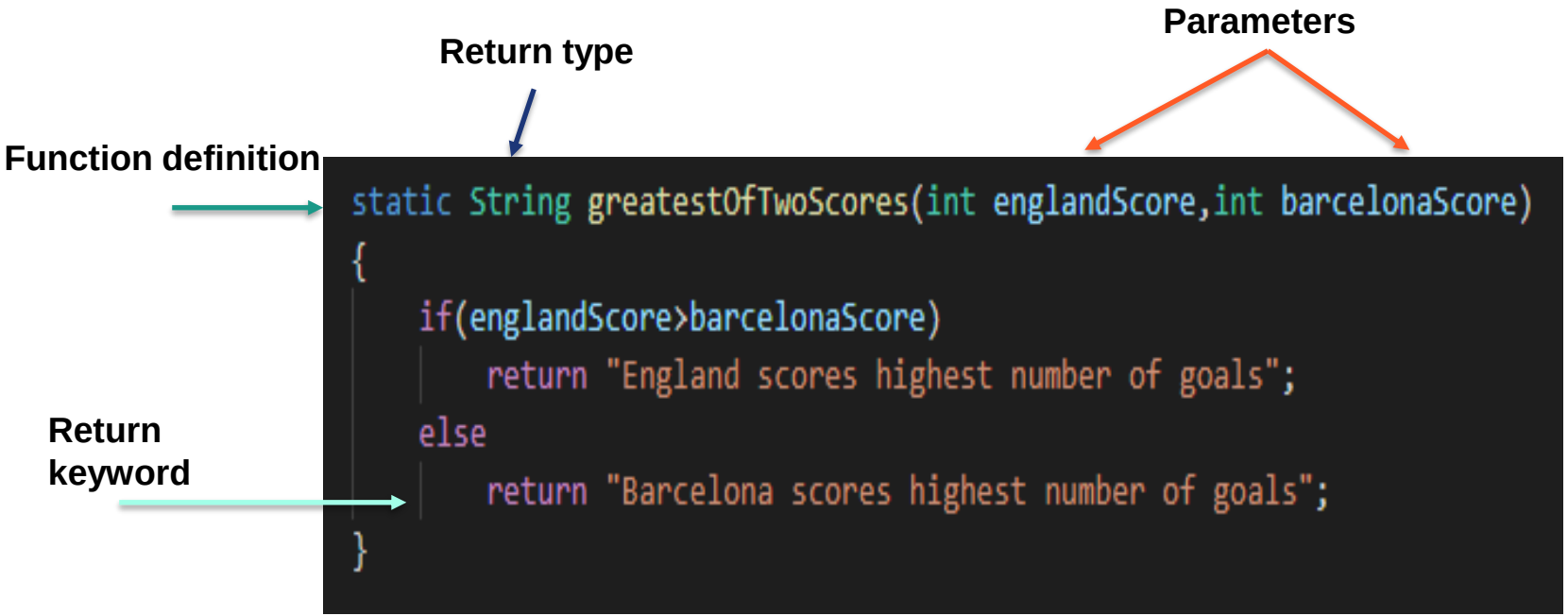
Find the greater of the two scores and print the name of the highest scoring team.



Function Arguments



Function Return Type



Function Call

- A function call is made from the main method of a Java program, so that the block of code gets executed.

- A static function is called using the syntax given below:

```
<class name>.<function name> (parameter list)
```

```
GreetMatchGoers.greatestOfTwoScores(5, 8);
```

Interactive Demo

In a school, the teachers of grades 1- 9 have to prepare the annual performance report of their students. Write a program that helps teachers accomplish this task.

Refactor this task using functions.

Advantages of Modular Programming Using Functions

- Improves readability as it reduces the length of the programs
- Simplifies understanding and debugging of the code
- Allows reusability of the code
- Makes management of large applications easier

Key Takeaways

- Modular programming using functions
- Types of functions in Java
- Defining and calling a function
- Implementation of static functions