Creating Methods

Java
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Again what is a method?

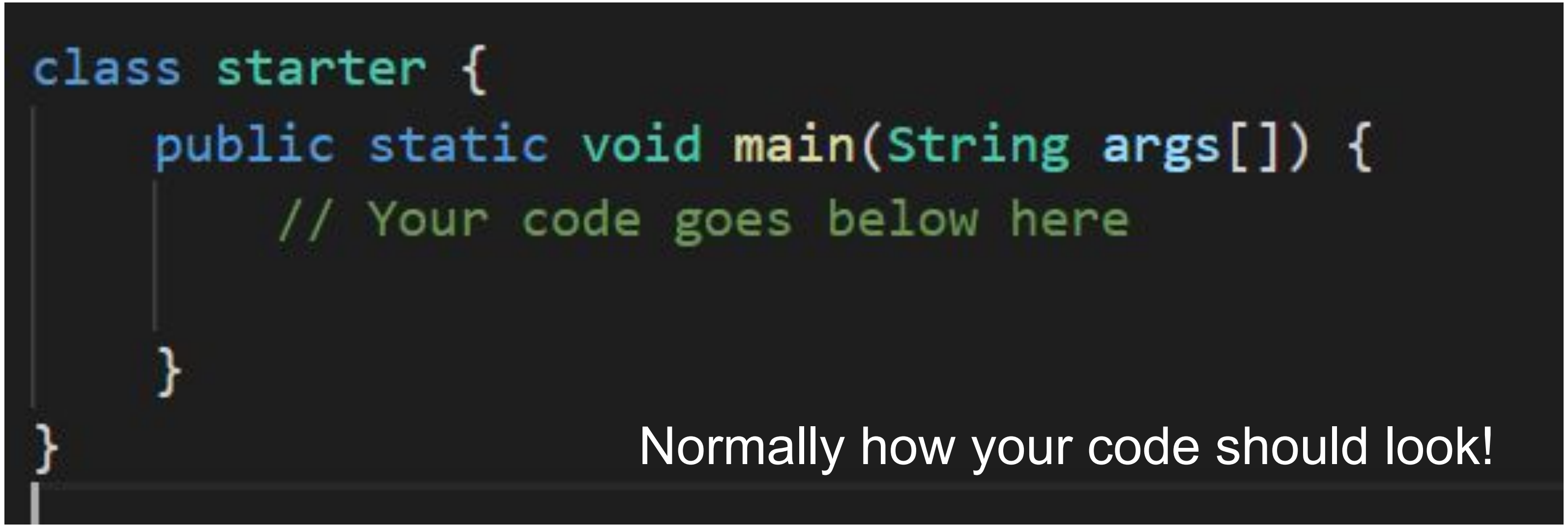
A method is a block of code which runs when it is called.

You can pass data, known as parameters, into a method.

Example: **`Math.max(3, 5);`**

This method calls the block of code that find the maximum of the two parameters given.

Example of a Method



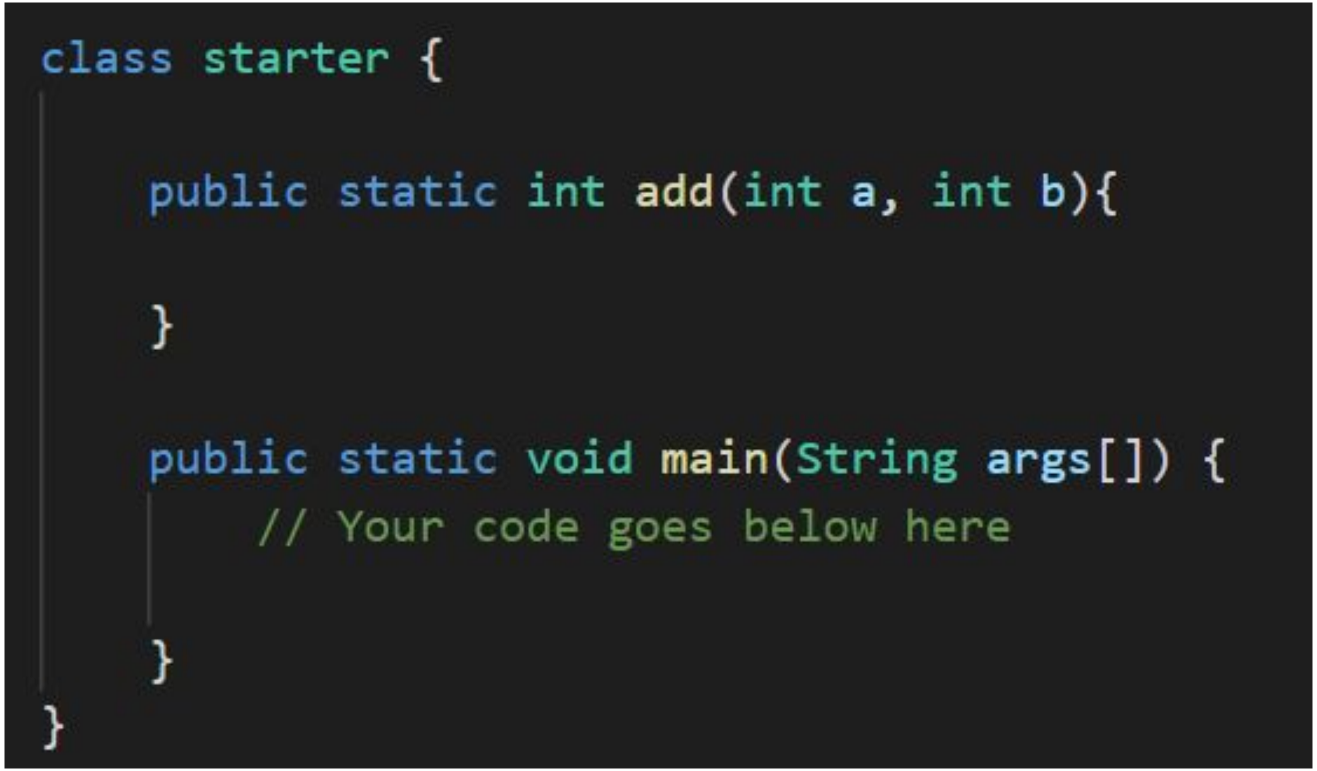
```
class starter {
    public static void main(String args[]) {
        // Your code goes below here

    }
}
```

Normally how your code should look!

Let’s make an addition method!

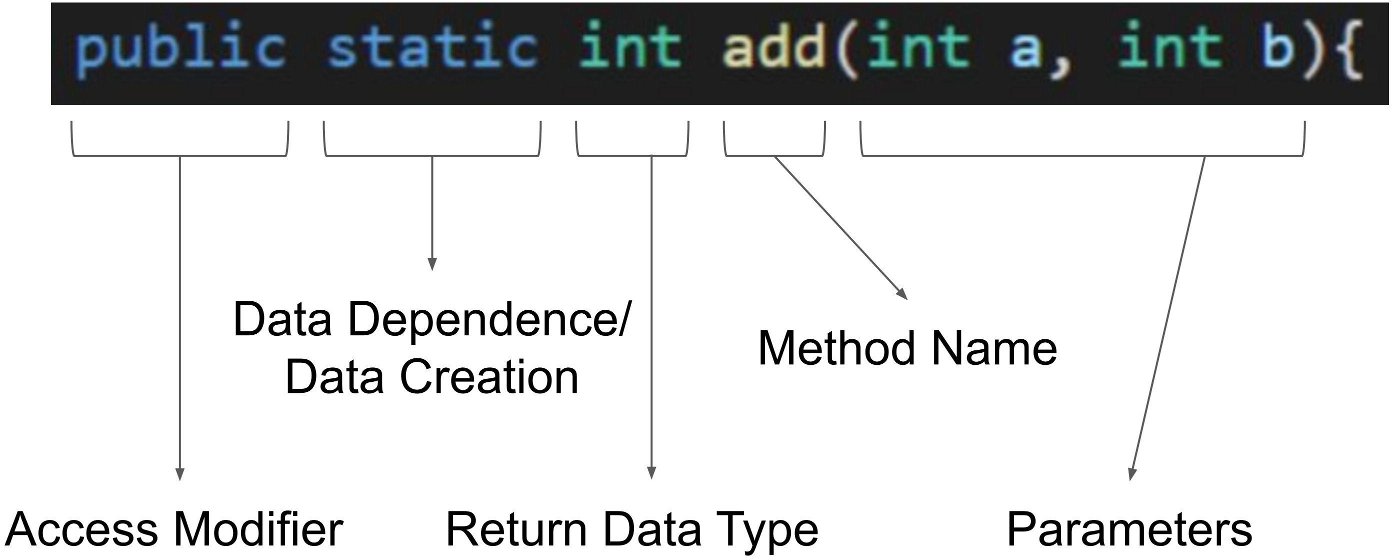
Goal: Take in two integers as parameters and add them up

Creating a Method - Addition



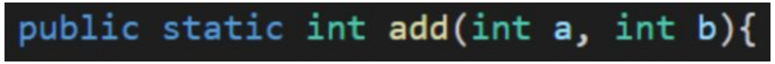
```
class starter {

    public static int add(int a, int b){

    }

    public static void main(String args[]) {
        // Your code goes below here

    }
}
```

Breaking down the “add” Method



```java
public static int add(int a, int b){
```

Access Modifier

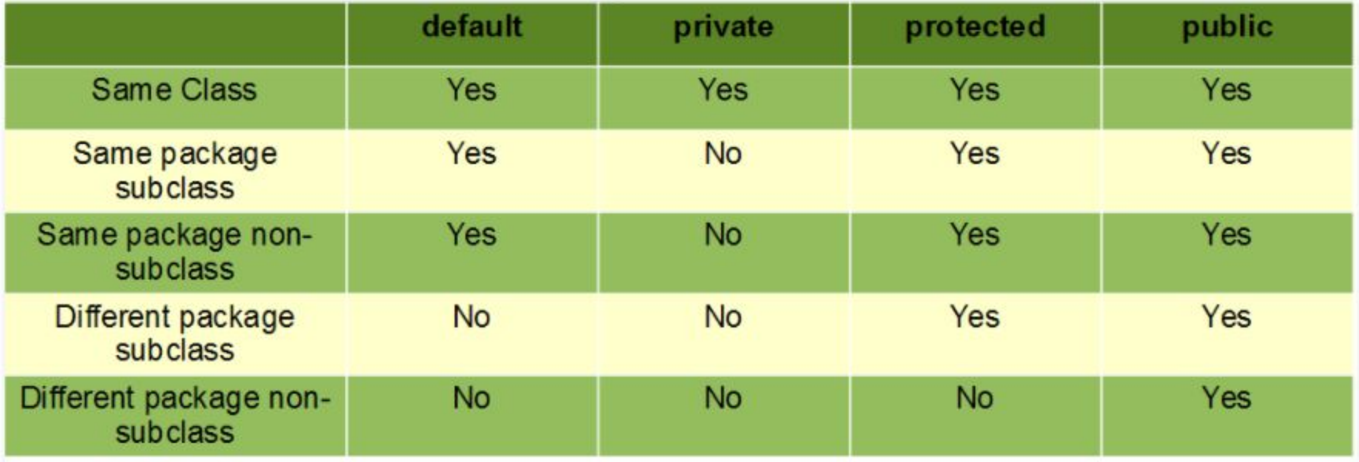


```
public static int add(int a, int b){
```

What can access your method!

Types: Private, Protected, Public

Examples of when methods can be used with given modifiers.

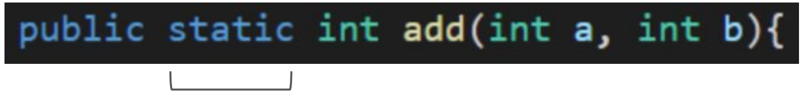


	default	private	protected	public
Same Class	Yes	Yes	Yes	Yes
Same package subclass	Yes	No	Yes	Yes
Same package non-subclass	Yes	No	Yes	Yes
Different package subclass	No	No	Yes	Yes
Different package non-subclass	No	No	No	Yes

We will mostly use Public.

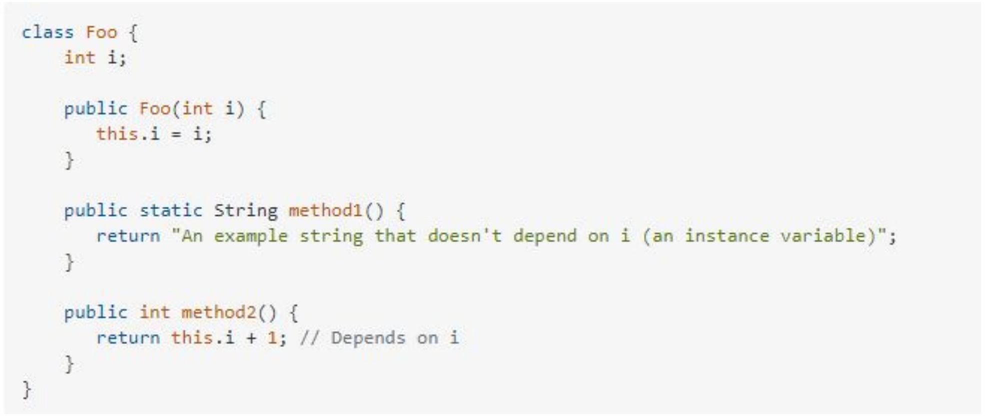
Data Dependency/ Data Creation

Types: Static and Non-Static



```
public static int add(int a, int b){
```

Static method belongs to the class itself and a non-static (aka instance) method belongs to each object that is generated from that class. If your method does something that doesn't depend on the individual characteristics of its class, make it static (it will make the program's footprint smaller). Otherwise, it should be non-static.

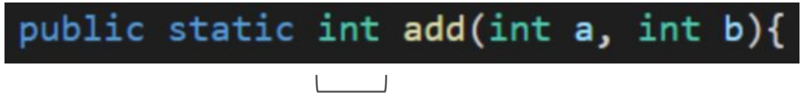


```
class Foo {
    int i;

    public Foo(int i) {
       this.i = i;
    }

    public static String method1() {
       return "An example string that doesn't depend on i (an instance variable)";
    }

    public int method2() {
       return this.i + 1; // Depends on i
    }
}
```

We will swap between static and non-static

Return Data Type - **IMPORTANT**!

This is the type of data that is returned to the caller of this method.



```java
public static int add(int a, int b){
```

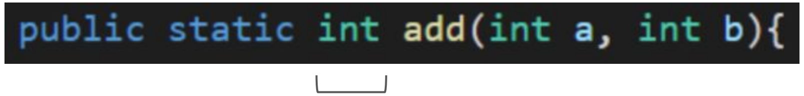
Example: When we call the below, we expect an integer to be given back as an answer.

```java
int x = add(2,3);
```

Valid Data Type: String, double, int, boolean, **void**

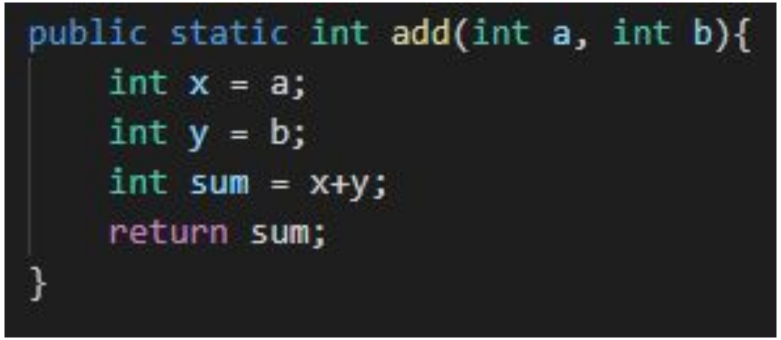
Void - this means nothing will be returned.

How to - Return Data Type



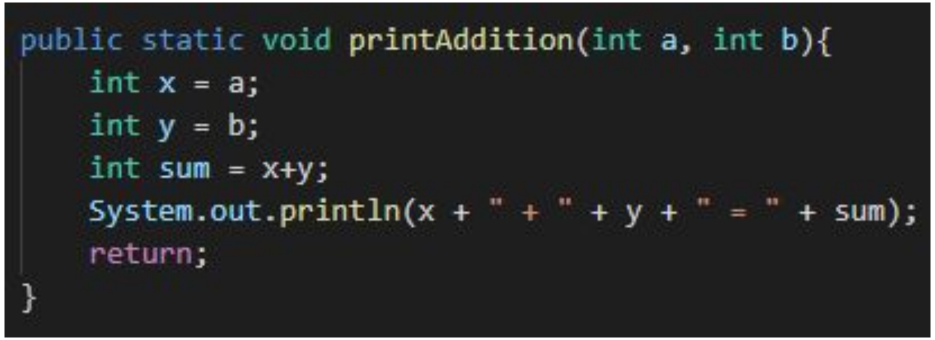
```java
public static int add(int a, int b){
```

Example of returning an integer.



```java
public static int add(int a, int b){
    int x = a;
    int y = b;
    int sum = x+y;
    return sum;
}
```

Example of returning void.

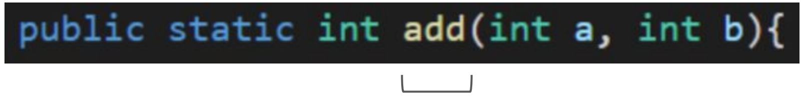


```java
public static void printAddition(int a, int b){
    int x = a;
    int y = b;
    int sum = x+y;
    System.out.println(x + " + " + y + " = " + sum);
    return;
}
```

WARNING: Return immediately ends your method. It should be the last thing called.

Method Name

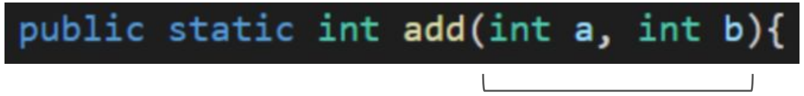
- Can be whatever you want!
- Capitalization does matter.
- Usually helps to name it what it does.



```
public static int add(int a, int b){
```

Parameters

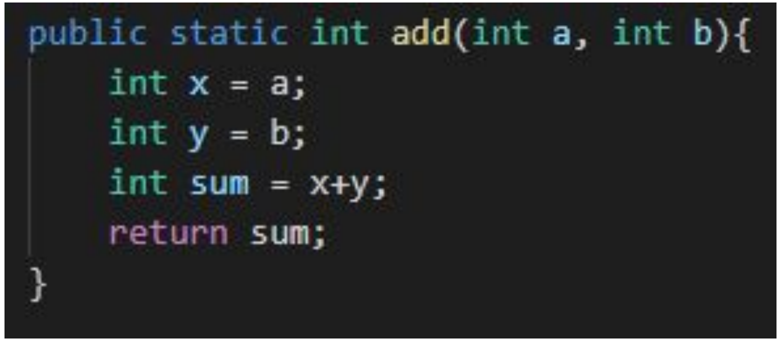
Parameters are data that is passed into the method for use. This data isn't able to be changed but can be used!



```
public static int add(int a, int b){
```

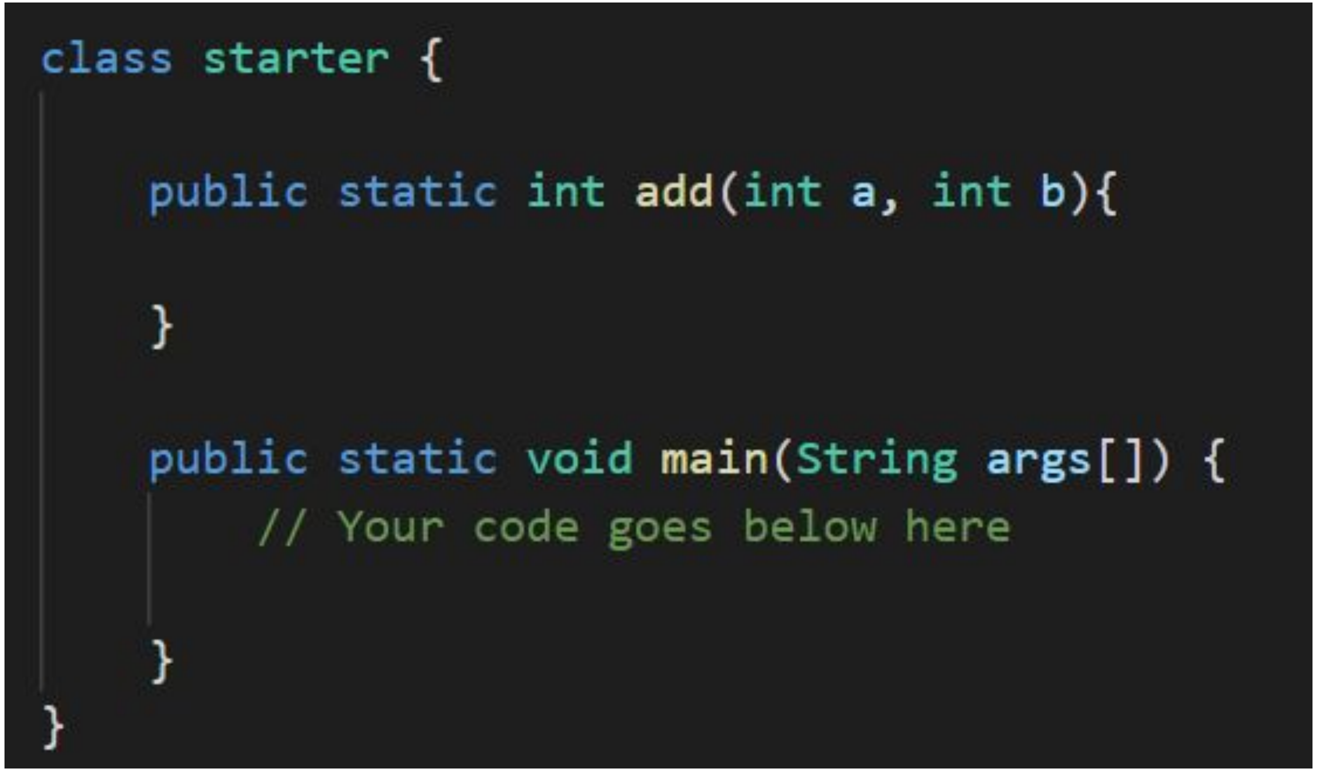
Methods can take as many parameters as you want! They should be used though.

Example: a and b are used in the add method below. They must be defined as ints



```
public static int add(int a, int b){
    int x = a;
    int y = b;
    int sum = x+y;
    return sum;
}
```

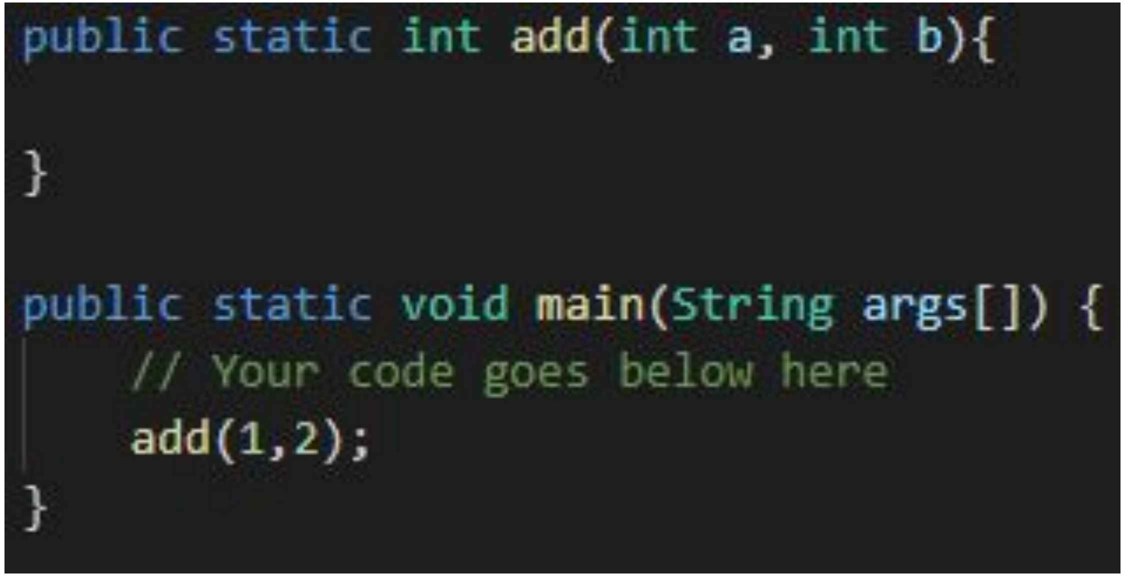
Calling Methods



```java
class starter {

    public static int add(int a, int b){

    }

    public static void main(String args[]) {
        // Your code goes below here

    }
}
```

Note: Methods should always go above the **main** method in your starter file.

Creating a Method - Try it!



```
public static int add(int a, int b){


}


public static void main(String args[]) {
    // Your code goes below here
    add(1,2);
}
```

You can call it using the code above for the example **add**.

Lab - Methods

1. Create a toString method in your starter.java
2. The function itself should print out whatever String is given to the user.
3. This method should have 1 String parameter
4. It should return nothing

Continued

1. Create a second method called toStringCombined.
2. The function itself should print out two given Strings side by side with a space in between.
3. Takes 2 String parameters
4. It should return nothing.