Module 1 Day 5

Command Line Applications: Inputs and Outputs
Methods
Command Line

You Made It! Happy Friday!

Module 1 Day 5

Can you?

1. … use System.in/System.out/Console.ReadLine() to perform console I/O in a program
2. … parse input from the input stream to primitive data types
3. … check for string equality
4. … string apart using known split character
5. … explain the process of a command line application (Take input, calculate data, give output)
6. … run your command line apps in your IDE

Methods

Methods

- Methods are **related** statements that complete a specific task or set of tasks.
- Methods can be called from different places in the code.
- When methods are called, they can be provided inputs or arguments to provide data for their parameters.
- Methods can also return a value to its caller. That return value is determined by the called method return type.

Methods: General Syntax

Here is the general syntax:

<access Modifier> **<return type>** **<name of the method>** (... arguments…) {

    // method code.

}

- The return type can be any of the data types (boolean, int, float, etc.) we have seen so far**
  -or-
- If the return type is “**void**”, that means the method performs a task and returns nothing.

Methods: Example

Here is a specific example of a non-void method:

```
public class MyClass {

        public int addTwoNumbers(int a, int b) {
                return a+b;
        }
}
```

The method addTwoNumbers is a method of the MyClass class.

The method has a return value of int, so there needs to be a return statement that returns an integer.

The method expects 2 parameters as input. More specifically, it expects 2 integers

Methods: Example

… and this is an example of a void method:

```
public class MyClass {

	public void addTwoNumbers(int a, int b) {
		System.out.println(a+b);
	}
}
```

This method is void; has no return statement. It only performs the task of sending the value of parameter a + parameter b to the console output stream.

Methods: Calling A Method

Methods can be called from other methods!

```
public class MyClass {

        public void callingMethod (String args[]) {

                int result = addTwoNumbers(3,4);
                System.out.println(result);

                String userName = fullName("Rich", "Seeds");
                System.out.println(userName);
        }

        public int addTwoNumbers(int a, int b) {
                return a+b;
        }

        public String fullName(String first, String last) {
                return last + ", " + first;
        }
}
```

Here, in MyClass() **callingMethod()** first calls the method **addTwoNumbers(int, int)**, saving its return to the variable **result**.

Then, **callingMethod()** calls **fullName(String, String)**, providing all needed parameters and saving the result to the variable **userName**.

Methods: Calling A Method

Once a method has been defined, it can be called from somewhere else.

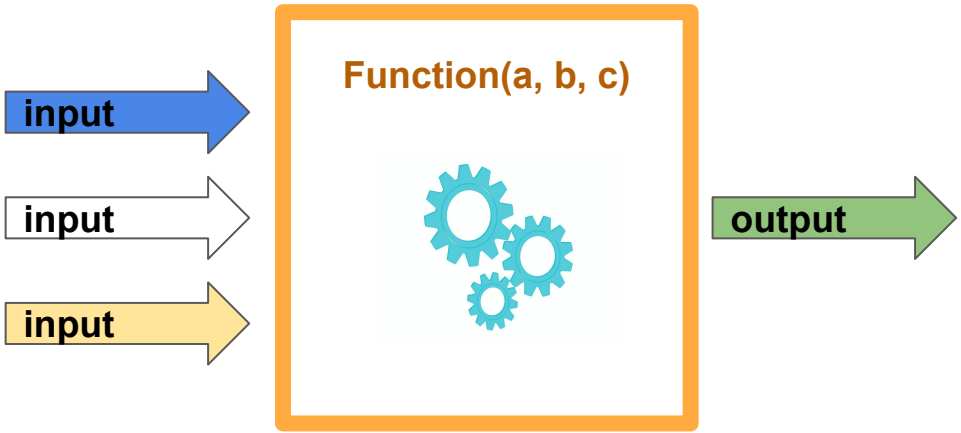
```
public class MyClass {

        public int addTwoNumbers(int a, int b) {
                return a+b;
        }

        public void callingMethod (String args[]) {

                int result = addTwoNumbers(3,4);
                System.out.println(result);
                // result will be equal to 7.
        }
}
```

addTwoNumbers takes 2 inputs, integer a and an integer b. These are known as **parameters**.

When we call **addTwoNumbers**, we must provide the exact inputs specified (in this case 2 integers).

Methods: In Summary

Methods are Java's versions of functions. Think of them as a processes that can take inputs (or none at all) and use it to generate output (or do work).

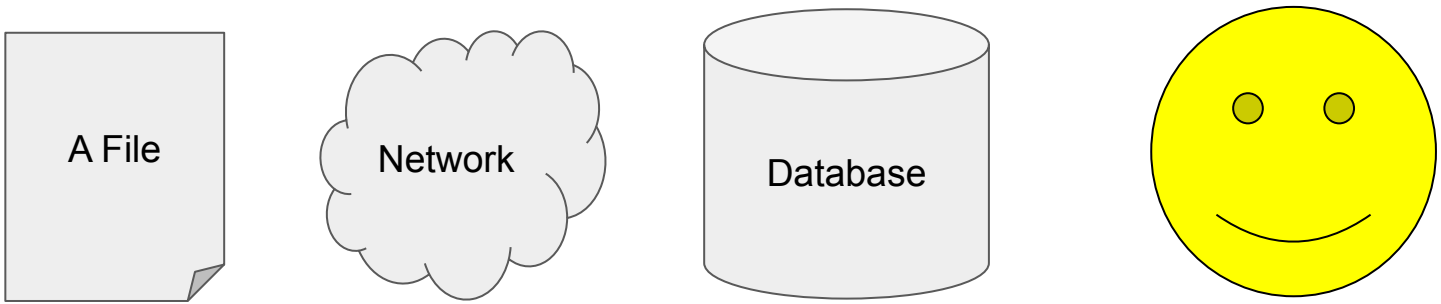


Command Line Input / Output

Getting Input from the Command Line

- All programming languages must have the ability to read data (input) in order to interact with the user and the systems, or world, around them

- Examples of input: a file, data being transmitted from a network, a datastore, or **data typed in by the user!**



Using the Scanner Object

```
import java.util.Scanner;

public class InputReader {

	public static void main(String[] args) {

		Scanner userInput = new Scanner(System.in);

		System.out.print("Please enter your name: ");
		String name = userInput.nextLine();

		System.out.print("Please enter your height: ");
		String heightInput = userInput.nextLine();
		int height = Integer.parseInt(heightInput);

		System.out.println("Your name is: " + name + ".");
		System.out.println("Your height is:  " + height + " cm's.");
	}
}
```

To use the scanner object, we must import in the correct class.

Create an object of type scanner

The input is read and stored into a String called name.

The input is read and stored into a String called heightInput.

heightInput is converted into an int using the **Integer Wrapper Class.**

Reading In Multiple Items

```
import java.util.Scanner;

public class InputReader {

	public static void main(String[] args) {

		Scanner userInput = new Scanner(System.in);
		System.out.print("Please enter several objects: ");
		String lineInput = userInput.nextLine();

		String [] inputArray = lineInput.split(" ");

		for (int i=0; i < inputArray.length; i++) {
			System.out.println(inputArray[i]);
		}
	}
}
```

This is one possible way to handle input for more than one item.

- When prompted a user enters each item separated by a space.
- The split method separates out each time using the spaces, and puts all of the items into an array!

Processing the Multiple Items Read

```java
import java.util.Scanner;

public class InputReader {

    public static void main(String[] args) {

        Scanner userInput = new Scanner(System.in);
        System.out.print("Please enter several objects: ");
        String lineInput = userInput.nextLine();

        String [] inputArray = lineInput.split(" ");

        for (int i=0; i < inputArray.length; i++) {
            System.out.println(inputArray[i]);
        }
    }
}
```

```
Console ×
<terminated> InputReader [Java Application] C:\Program Files\Java\jre1.8.0_211\bin\javaw.exe (Sep
Please enter several objects: Ford GM Chrysler Toyota Honda Nissan BMW
Ford
GM
Chrysler
Toyota
Honda
Nissan
BMW
```

The user entered each car brand separated by a space

The whole input is “split” and repackaged as an array

Wrapper Classes

- Up until now, we have seen most of the **primitive** data types, to name a few: **int**, **boolean**, **char**, **long**, **float…**
- You have also seen some **non-primitive** types: **Strings** and **Arrays**
- You might have noticed that non-primitive types seem to have extra functionality that can be invoked with the dot operator, for example: (**myArray.length**).
- All the primitive data types have more powerful non-primitive equivalents, these are called **wrapper classes**. You have seen an example of this.

```
int height = Integer.parseInt(heightInput);
```

* albeit this example uses a static method of the wrapper class (more on this at a later date)

Wrapper Classes

Unboxing ⟷ Boxing

Primitive	Wrapper	Example of Use
int	Integer	Integer myNumber = 3;
double	Double	Double myDouble = 3.1;

Declaring a variable using the Wrapper class gives you a little bit more flexibility. For example, you are able to run certain utility methods by using the dot operator.

```
Integer myNumber = 3;
String myStringNumber = myNumber.toString();
```

In the above example we have used a Wrapper class, **Integer**, and then a method of that class , **.toString()**, to convert the value to a String. In general, if you know type conversions are needed, wrapper classes are a good idea.