



Primary Programming Essentials Lesson 2

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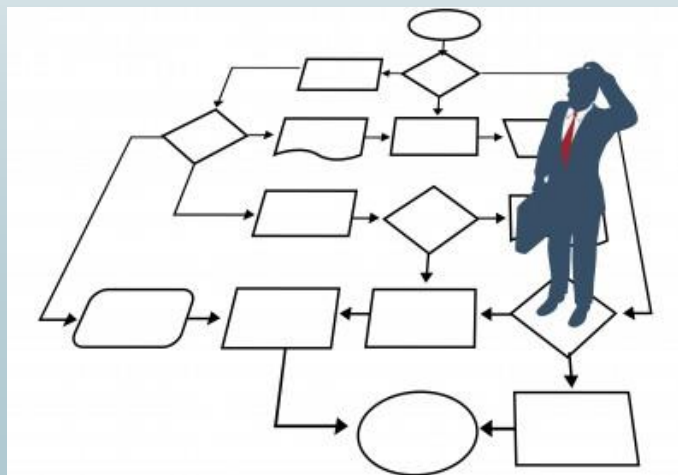
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What is a Program?

- We've talked about writing a program, but what is that?
- Program = Data + Algorithm
 - But what is an algorithm??
- Let's start defining what some of these terms are





What is a Program?

- **Algorithm**
 - A sequence of instructions
 - Like the steps of a Brownie Recipe
- **Data**
 - Numbers, Text, Images, etc.
 - Like the ingredients to a Brownie Recipe



What is a Program?

- **Program**

- Program = Data + Algorithm

- A set of instructions mixed with some data.

- We will soon write the algorithms, but we need to learn about creating data first





What is a Program?

- What is **Data** to the computer?
 - How do we create Data?
 - How does the computer remember it?





What is a Program?

- Data is the stuff that we can define in the computer
 - Numbers
 - Text
 - Etc...
- Data is stored within variables
 - Variables are like boxes that can only hold one value



What is a Program?

What is a variable?

- A UPS store has many different boxes.
 - The boxes are organized by what they can carry (its **type**)
- A computer needs to know how big a space to make for the information.





What is a Program?

Eric

Name_1

1,405

Name_2

Thomas

My_number



Activity!!!



Activity

What does this program fragment do?

```
String color_1 = "red";  
String color_2 = "green";
```

```
temp = color_1;  
color_1 = color_2;  
color_2 = temp;
```



Activity

What does this program fragment do?

```
String color_1 = "red";
```

```
String color_2 = "green";
```

```
color_1 = color_2;
```

```
color_2 = color_1;
```



Some important Coding Rules



Building Blocks in Java Programming

Why do I need to use braces (curly brackets { })?

- Imagine a book with chapters, sections, subsections, and paragraphs. Braces define these type of sections.
- Braces denote the beginning and end of a code section
 - The computer knows where our program starts and where it ends.

```
public class Math {  
    public static void main(String[] args) {  
        double sum = addition(2,3);  
    }  
}
```



Building Blocks in Java Programming

Why do I need to use semicolons?

- Imagine a story without ending the sentences no starting new sentences with uppercase either that would be really hard to read you wouldn't know to stop things would just go on and on when will this stop I wonder....
- Semicolons end statements or instructions in a code section.
- **Section references do not need semicolons.**

```
public class Math {  
  
    public static double addition(double a, double b) {  
        double c = a + b;  
        return c;  
    }  
}
```



Variables and Data Types

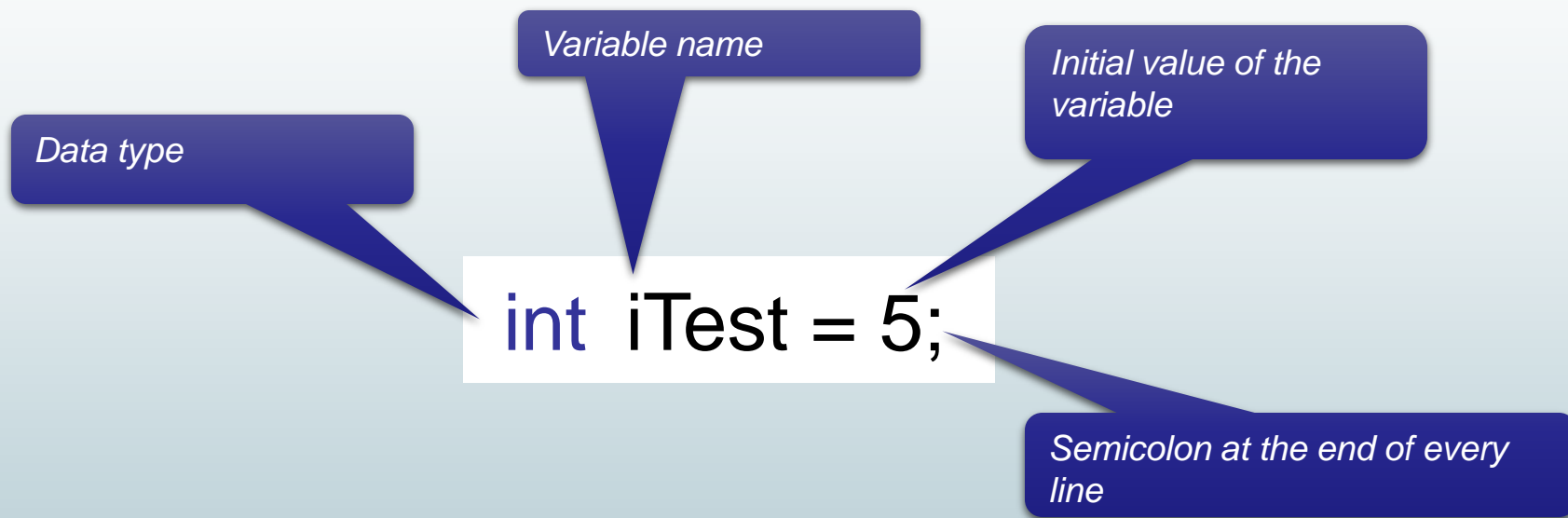
Basic data types

- **int**
 - an integer number (which means no decimal point)
- **String**
 - a sequence of characters like “Hello World!”
- **boolean**
 - two possible values, True or False
- There are more, but we’ll see them later



Variables and Data Types

Basic data types



A variable can also be made without giving it an initial value.



Variables and Data Types

Basic data types

- There are some special rules that you'll come across. Let's introduce a few.
 1. All variables created must start with a letter of the alphabet.
 2. Variables may contain letters, numbers, or an underscore (_)
 3. Variable names can be of any length
 4. Names are case-sensitive
 - **VariableName** is different from **variableName**



Variables and Data Types

Basic data types

- Example variable names:
 - myNumber
 - a_new_variable
 - TheRe_ARE_Many_CaPITaIS_Here
 - Woooooo_1123451_NUMBERS



Coding Activity!!!



END