

# Getting Started With Java

## Output of Variables (with Strings & Numbers)

# Recall:

## Recognizing Text vs Numbers

In a previous lesson, we considered output involving 2 and 3 in various forms:

```
System.out.println("2 + 3");  
System.out.println(2 + 3);  
System.out.println("2" + "3");
```

**Output:**  
2 + 3  
5  
23

# Recognizing Text vs Variables

How would the same code apply if we used variables instead of numbers? Can we anticipate the results?

```
int a = 2;  
int b = 3;  
System.out.println("a + b");  
System.out.println(a + b);  
System.out.println("a" + b);
```

**Output:**

**Try to predict the output for each line of code**

# Recognizing Text vs Variables

"a + b"

In this case, everything is between quotation marks. The whole expression is a string (text), including the plus sign.

Therefore, Java does not recognize 'a' and 'b' as variables. This is just a string.

```
System.out.println("a + b")
```

Output:

```
a + b
```

# Recognizing Text vs Variables

a + b

Now there are no quotes, so Java tries to interpret the meaning of each symbol. In this case, the variables are both integers, so the plus sign must mean "addition".

Where Java sees the variable 'a', it thinks '2'. For 'b', it thinks '3'. Thus the actual math is '2 + 3'.

```
int a = 2;  
int b = 3;  
System.out.println(a + b);
```

Output:

5

# Recognizing Text vs Variables

"a" + b

The letter 'a' is inside quotation marks. It is a string, so the variable 'a' is ignored. The plus sign and the 'b' are outside the quotes, so they have another meaning.

Since the "a" comes first, the plus is adding to a String, which is concatenation, joining strings together.

```
int a = 2;  
int b = 3;  
System.out.println("a" + b)
```

Output:

a3