Getting Started With Java

Output of Numbers

Typical Java Program
Output a String

```
class OutputTextString
{
  public static void main(String[] args)
  {
    System.out.println("hello world");
  }
}
```

hello world

Typical Java Program
Output a String with Numbers

```
class OutputNumberString
{
  public static void main(String[] args)
  {
    System.out.println("23");
  }
}
```

23

Typical Java Program
Output a String with Numbers

```
class OutputNumber
{
  public static void main(String[] args)
  {
    System.out.println(23);
  }
}
```

23

Output in Java is not limited to text (strings). It can also output different data types including integers and float (decimal) numbers.

Java has a full set of mathematical operators which can be used to manipulate these numeric values.

These operators can be incorporated into the output of a Java program to demonstrate calculations.

Typical Java Program
Output Integer Calculations

```
class SimpleCalculations
{
   public static void main(String[] args)
   {
      System.out.println(2+3);
      System.out.println(2-3);
      System.out.println(2*3);
      System.out.println(2/3);
   }
}
```

Output

5

-1

6

strange result! → 0

Typical Java Program
Output Decimal Calculations

```
class SimpleCalculations
{
   public static void main(String[] args)
   {
      System.out.println(2.0+3.0);
      System.out.println(2.0-3.0);
      System.out.println(2.0*3.0);
      System.out.println(2.0/3.0);
   }
}
```

Output

5.0
-1.0
6.0
0.6666666666666666

Basic Math in Java

operation	operator	example
add	+	2 + 3 = 5
subtract	-	2 – 3 = -1
multiply	*	2 * 3 = 6
divide	/	6 / 2 = 3

Order of Operations

Recall: BEDMAS

- B = Brackets
- E = Exponents
- D = Division
- M = Multiplication
- A = Addition
- S = Subtraction

Order of Operations

Programming languages like Java will use order of operations for calculations. Unlike a human, Java will NOT make assumptions about the correct order.

To avoid problems, use brackets to force Java to do calculations in the order you intended.

Order of Operations

Consider the following examples. The order of the numbers and operations are all the same, but the placement of brackets gives very different results.

```
5.0 * 4.0 + 3.0 / 2.0 = 21.5

5.0 * (4.0 + 3.0) / 2.0 = 17.5

5.0 * (4.0 + 3.0 / 2.0) = 27.5

(5.0 * 4.0 + 3.0) / 2.0 = 11.5
```