Tutorial 1

1. Which of these are **not** allowed as variable names?
   1. The cost
   2. 2Much
   3. Much2
   4. *star
   5. My999Var

2. Write a program to put zero in a variable called runningtotal. Then write separate instructions to add the following numbers onto what is in the variable, adding one number at a time 5, 8, 2, 3

```
public class Tutorial {
      public static void main(String[] args){
            int runningTotal = 0;
            runningTotal += 5;
            runningTotal += 8;
            runningTotal += 2;
            runningTotal += 3;
            System.out.println(runningTotal);
      }
}
```

3. Write a program to declare a variable for each variable type, then initialize each variable to its minimum and maximum value and print the result. Then try adding and subtracting 1 from each respectively. Describe what happens and why
`int myInt = 2147483647; System.out.println(myInt + 1);`

```
public class Tutorial{
        public static void main(String[] args){
                // minimum values
                byte myByteMin = -128;
                short myShortMin = -32768;
                int myIntMin = -2147483648;
                long myLongMin = -9223372036854775808l;
                float myFloatMin = 3.4e-038f;
                double myDoubleMin = 1.7e-308;
                // maximum values
                byte myByteMax = 127;
                short myShortMax = 32767;
                int myIntMax = 2147483647;
                long myLongMax = 9223372036854775807l;
                float myFloatMax = 3.4e+038f;
                double myDoubleMax = 1.7e+308;
                // boolean myBoolean = true;
                // char myChar = 'A';
                System.out.println(myByteMin - 1);
                System.out.println(myByteMax + 1);
                System.out.println(myShortMin - 1);
                System.out.println(myShortMax + 1);
                System.out.println(myIntMin - 1);
                System.out.println(myIntMax + 1);
                System.out.println(myLongMin - 1);
                System.out.println(myLongMax + 1);
                System.out.println(myFloatMin - 1);
                System.out.println(myFloatMax + 1);
                System.out.println(myDoubleMin - 1);
                System.out.println(myDoubleMax + 1);

        }
}
```

"The type of each value is converted to type of the higher type in the expression"

4. Write a program that reads in three exam marks and calculates their mean (average) and outputs the result.

```
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args){
		Scanner input = new Scanner(System.in);
		System.out.print("Enter mark1 => ");
		int mark1 = input.nextInt();
		System.out.print("Enter mark2 => ");
		int mark2 = input.nextInt();
		System.out.print("Enter mark3 => ");
		int mark3 = input.nextInt();

		double average = (mark1 + mark2 + mark3)/3;
		System.out.println("Average is " +  average);

	}
}
```

5. Write a program to calculate the volume of a box given its three dimensions (length, height, width)

```
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args){
		Scanner input = new Scanner(System.in);
		System.out.print("Enter length => ");
		double length = input.nextDouble();
		System.out.print("Enter height => ");
		double height = input.nextDouble();
		System.out.print("Enter width => ");
		double width = input.nextDouble();

		double volume = (length * height * width);
		System.out.println("Volume is " +  volume);

	}
}
```

6. Write a program that changes metres into centimetres. When the program is run it should allow you to enter in the number of metres and then the program should print out the number of centimetres.

```
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args){
		Scanner input = new Scanner(System.in);
		System.out.print("Enter meters value => ");
		double meters = input.nextDouble();
		double centimeters = (meters * 100);
		System.out.println(centimeters + " cm");

	}
}
```

7. Write a program that will read in a Centigrade temperature and then display the Fahrenheit temperature using the formula
   F = (9.0/5)*C + 32

```
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args){
		Scanner input = new Scanner(System.in);
		System.out.print("Enter Centigrade value => ");
		double centigrade = input.nextDouble();
		double fahrenheit = (9.0/5)*(centigrade) + 32;
		System.out.println(fahrenheit + " *F");

	}
}
```

8. Assume the variable "v1"references a double value. Write a statement that displays the value rounded to two decimal points

```
import java.lang.Math;
public class Tutorial{
	public static void main(String[] args) {
		double v1 = 3.1428;
		System.out.println(Math.round(v1 * 100.0) / 100.0);
		System.out.printf("%.2f", v1);
	}
}
```

9. A company employs Manual, Skilled and Management people. Manual earn £500 per week, Skilled earn £700 per week and Management earn £800 per week.
   Write a program that reads in how many manual, skilled and management people there are in a company and then print out the wage bill.
   The program should additionally print out the approximate tax to pay which is 20% of the total wage bill.

```
import java.util.Scanner;
public class Tutorial{
	public static void main(String[] args) {
		final int MANUAL_AMOUNT = 500;
		final int SKILLED_AMOUNT = 700;
		final int MANAGEMENT_AMOUNT = 800;

		Scanner input = new Scanner(System.in);
		System.out.print("Enter manual people count => ");
		int manualCount = input.nextInt();
		System.out.print("Enter skilled people count => ");
		int skilledCount = input.nextInt();
		System.out.print("Enter management people count => ");
		int managementCount = input.nextInt();

		long totalWage = (manualCount * MANUAL_AMOUNT) +
				(skilledCount * SKILLED_AMOUNT) +
				(managementCount * MANAGEMENT_AMOUNT);
		System.out.println("Wage: " + totalWage);
		double tax = totalWage * 0.2;
		System.out.println("Tax: " + tax);
	}
}
```

10. Assume the following statement has been executed:

number = 1234567.456

Write a Java statement that displays the value referenced by the number variable formatted as 1,234,567.5

```
public class Tutorial{
        public static void main(String[] args) {
                double number = 1234567.456;
                System.out.printf("%,.1f", number);
        }
}
```