Every **variable** in a Java program must be declared before it is used for the first time

```
String firstName;
```

```
firstName;
```

```
firstName = "Bob";
```


`firstName`

Bob

```
System.out.println(firstName);
```

Output:

Bob

```
String firstName;
```

data Type variable name

```
String firstName;
```

# Code Refactoring

```
public class SpongeBob {
    public static void main(String[] args) {
        System.out.println("SpangeBob: Hello Star");
        System.out.println("Patrik: Hi yellow boy");
        System.out.println("SpangeBob: Are you learning coding?");
        System.out.println("Patrik: Yes,but i have one problem");
        System.out.println("SpangeBob: Which?");
        System.out.println("Patrik: My computer is not working under the sea!))");
    }
}
```

```
 public static void main(String args[]) {
      String student1 = "Anna";
      String student2 = "Ari";
      String student3 = "Rocio";
      String student4 = "Selvin";
      String student5 = "Frank";

      String javaClass = student1 + student2 + student3 + student4 + student5;

      System.out.println(javaClass);
}
```

TODO:

1. Create a java class *Box*
2. Declare String variables: *box*
3. Assign values as *flowers*
4. Print variable *box*
5. Reassign value as *books*
6. Print variable *box*

```java
import java.util.Scanner;

public class Input {
public static void main(String[] args) {

    Scanner sc = new Scanner(System.in);
    String input = sc.nextLine();

    System.out.println(input);

    }
}
```

TODO:

1. Create a Java program *SimpleSiri*
2. It should ask:
   *Hi there, what's your name?*
   your answer..
   *Nice to meet you <answer> !*
3. It should ask:
   *What are you studying now?*
   your answer..
   *Oh, <answer> is great subject to study!*
4. It should ask:
   *What's your favorite movie?*
   your answer..
   *I heard about it.  <answer> is a great movie..*

# Java Identifiers

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- An identifier must begin with a letter or the symbols $ or _ (underscore)
- Java is case sensitive
- Good practice to follow – names of classes start with an uppercase letter, and the names of variables and methods start with a lowercase letter
- Keywords or reserved words cannot be used as the names of variables, classes or methods.

# Assignment Statements

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- Use an **assignment statement** to give a variable value or to change it
- The equal sign, =, is called the **assignment operator**
- **Variable = Expression;**

```java
public class Box {
  public static void main(String args[]) {

    String item1 = "book\n";
    String item2 = "cup\n";
    String item3 = "glasses\n";
    String item4 = "pen";

    String box = item1 + item2 + item3 + item4;
    System.out.println(box);

    }
}
```

```
public class EggBasket
{
   public static void main(String[] args)
   {
      int numberOfBaskets, eggsPerBasket, totalEggs;

      numberOfBaskets = 10;
      eggsPerBasket = 6;

      totalEggs = numberOfBaskets * eggsPerBasket;

      System.out.println("If you have");
      System.out.println(eggsPerBasket + " eggs per basket and");
      System.out.println(numberOfBaskets + " baskets, then");
      System.out.println("the total number of eggs is " + totalEggs);
   }
}
```

*Variable declarations*

*Assignment statement*

### Sample Screen Output

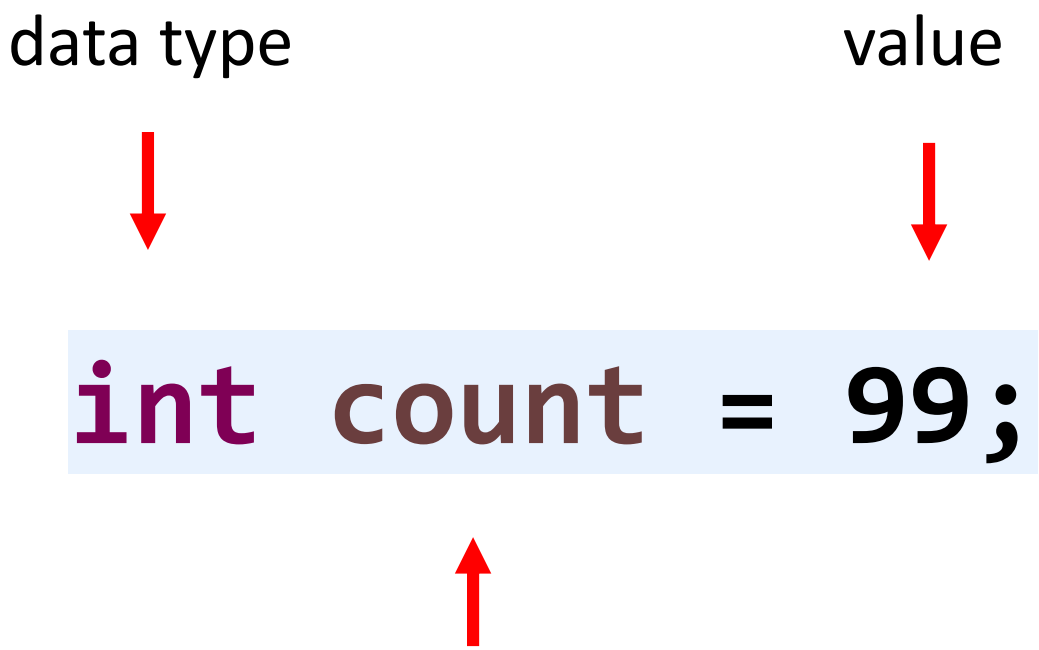
```
If you have
6 eggs per basket and
10 baskets, then
the total number of eggs is 60
```

# Data Types

| | |
|---|---|
| Characters | Hello World, ‘A’, !, $ |
| Numeric | 0, 1, 1.5, 10e2 |
| Logical Conditions | true, false |

# Primitive Types

| Type Name | Kind of Value | Memory Used | Range of Values |
|---|---|---|---|
| `byte` | Integer | 1 byte | –128 to 127 |
| `short` | Integer | 2 bytes | –32,768 to 32,767 |
| `int` | Integer | 4 bytes | –2,147,483,648 to 2,147,483,647 |
| `long` | Integer | 8 bytes | –9,223,372,036,8547,75,808 to 9,223,372,036,854,775,807 |
| `float` | Floating-point | 4 bytes | $\pm 3.40282347 \times 10^{+38}$ to $\pm 1.40239846 \times 10^{-45}$ |
| `double` | Floating-point | 8 bytes | $\pm 1.79769313486231570 \times 10^{+308}$ to $\pm 4.94065645841246544 \times 10^{-324}$ |
| `char` | Single character (Unicode) | 2 bytes | All Unicode values from 0 to 65,535 |
| `boolean` | | 1 bit | True or false |


data type
value
int count = 99;
identifier

# Primitive variables for whole numbers:

```
byte
short
int
long
```

# Primitive variables for floating numbers:

```
float
double
```

# Character

`char`

```
char h = 'H';
char i = 'I';
```

# Boolean

```
boolean
```

# arithmetic operators

\+ - * / %

TODO:

1. Create a Java program *Addition*
2. Declare and assign values for two int variables

```
int num1 = 5;
int num2 = 6;
```

3. Declare third int variable and assign value as sum of two previous variables

```
int result = num1 + num2;
```

4. Print result variable

TODO:

- For previous class *Addition* add Scanner to take user input for two int variables

```
.nextInt();
```

TODO:

1. Create a Java program *Subtraction*
2. Declare and assign values for two int variables
3. Declare third int variable and assign value as result of subtraction of two previous variables

```
int result = num1 - num2;
```

4. Print result variable

TODO:

- For previous class *Subtraction* add Scanner to take user input for two int variables

TODO:

- Create Java program to multiply two number from user

*output ex:*

```
6
*
7
=
42
```

TODO:

- Create Java program to divide two number from user

*output ex:*

```
25
/
5
=
5
```

whole number is for whole numbers

```
int num1 = 89;
int num2 = 10;

System.out.println(num1/num2);

Output: 8
```

# Specialized Assignment Operators

+=  -=  *=  /=

```
public class EggBasket
{
   public static void main(String[] args)
   {
      int numberOfBaskets, eggsPerBasket, totalEggs;

      numberOfBaskets = 10;
      eggsPerBasket = 6;

      totalEggs = numberOfBaskets * eggsPerBasket;

      System.out.println("If you have");
      System.out.println(eggsPerBasket + " eggs per basket and");
      System.out.println(numberOfBaskets + " baskets, then");
      System.out.println("the total number of eggs is " + totalEggs);
   }
}
```

*Variable declarations*

*Assignment statement*

### Sample Screen Output

```
If you have
6 eggs per basket and
10 baskets, then
the total number of eggs is 60
```

TODO:

- Add Scanner to *EggBasket* class
- Get input from user for  numberOfBaskets variable

# Remainder

%

# A Change-Making Program

# Requirement

- Write a program that accepts from a user whole number from 1 to 99
- The program responds by telling the user one combination of coins that equals that amount of change

```
Enter a whole number from 1 to 99.
I will find a combination of coins
that equals that amount of change.
87
87 cents in coins:
3 quarters
1 dime
0 nickels and
2 pennies
```