



Computer Science Virtual Learning

HS Computer Science A

April 14th, 2020



Lesson: Declaring Variables In Java?

Objective/Learning Target:

Understanding how and why we declare variables in Java



Bell Ringer Activity

List below the four types of variables discussed in the previous lesson and give an example of each

1.
 - a. Example:
2.
 - a. Example:
3.
 - a. Example:
4.
 - a. Edample:



Declaring a Variable

Computers store all values using bits (binary digits). A bit can represent two values and we usually say that the value of a bit is either 0 or 1.

To create a variable, you must tell Java its type and name. Creating a variable is also called declaring a variable. When you create a primitive variable Java will set aside enough bits in memory for that primitive type and associate that memory location with the name that you used. You have to tell Java the type of the variable because Java needs to know how many bits to use and how to represent the value. The 3 different primitive types are all represented using binary numbers (numbers that use base 2 with digits 0 and 1), but are represented in different ways. For practice converting between decimal and binary see http://forums.cisco.com/CertCom/game/binary_game_page.htm.

Declaring a Variable - Memory Location

When you declare a variable, a memory location (sequential number of bits) is set aside for a variable of that type and the name is associated with that location. An integer gets 32 bits of space, a double gets 64 bits of space and a boolean could be represented by just one bit, but the amount of space isn't specified by the Java standard.



Figure 1: Examples of variables with names and values. Notice that the different types get a different amount of space.

Declaring a Variable - Type Name

To **declare** (create) a variable, you will specify the type, leave at least one space, then the name for the variable and end the line with a semicolon (;). Java uses the keyword **int** for integer, **double** for a floating point number (a double precision number), and **boolean** for a Boolean value (true or false).

type name;

Figure 2: How to Declare a Variable

Here is an example declaration of a variable called score.

```
int score;
```



Check Your Understanding

Answer the following questions to check your understanding of the material in the previous slides

1. Circle/Highlight the variable declarations in the following code:

```
public class Test2
{
public static void main(String[] args)
{
    int numLives;
    numLives = 0;
    System.out.println(numLives);
    double health;
    health = 8.5;
    System.out.println(health);
    boolean powerUp;
```

Declaring a Variable - Initializing a Value

You can also optionally specify an initial value for the variable by adding an equals sign = followed by the value.

type name = value;

Figure 2: How to Declare and Initialize the Value of a Variable

Here is an example that shows declaring a variable and initializing it all in a single statement.

```
int score = 4;
```




Check Your Understanding

Answer the following questions to check your understanding of the material in the previous slides

1. Circle/highlight all of the variable initializations (first time the variable is set to a value) in the following code.

```
public class Test2
{
    public static void main(String[] args)
    {
        int numLives;
        numLives = 0;
        System.out.println(numLives);
        double health;
        health = 8.5;
        System.out.println(health);
        boolean powerUp;
```

Answer the following questions to check your understanding of the material in the previous slides

2. Circle/highlight all of the statements that both declare and initialize a variable in one statement

```
public class Test2
{
    public static void main(String[] args)
    {
        int numLives = 0;
        System.out.println(numLives);
        double health = 8.5;
        System.out.println(health);
        boolean powerUp = true;
        System.out.println(powerUp);
    }
```



Check Your Understanding

Answer the following questions to check your understanding of the material in the previous slides

1. Fill in the following to declare age to be an integer and set its value to 5.
_____ age = _____
2. What type should you use for a shoe size like 8.5?
3. What type should you use for a number of tickets?

4. The following method has the code to declare and initialize variables for storing a number of visits, a person's temperature, and if the person has insurance or not. It also includes extra blocks that are not needed in a correct solution. Number the needed blocks below in the correct order (declaring numVisits, temp, and hasInsurance in that order). You will not use all of the blocks

- _____ double temp = 101.2;
- _____ Double temp = 101.2;
- _____ int numVisits = 5;
- _____ Int numVisits = 5;
- _____ boolean hasInsurance = false;
- _____ Boolean hasInsurance = false;



For More Resources and to Check Answers

Go to: <https://runestone.academy/runestone/books/published/apcsareview/VariableBasics/declareVars.html>