

Building Java Programs

Lab 2: Ch. 2: Expressions and Variables, For Loops

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Variables

Recall that you can use a **variable** to store the results of an expression in memory and use them later in the program.

```
type name;           // declare
name = value or expression; // assign a value
...
type name = value or expression; // declare-and-initialize together
```

Examples:

```
double iPhonePrice;
iPhonePrice = 499.95;

int siblings = 3;
System.out.println("I have " + siblings + " brothers/sisters.");
```

Exercise 5: Variable declaration syntax

Which of the following choices is the correct syntax for declaring a real number variable named `grade` and initializing its value to `4.0`?

- a. ☐ `grade = 4.0;`
- b. ☐ `4.0 = grade;`
- c. ☐ `int grade = 4.0;`
- d. ☐ `grade : 4.0;`
- e. ☐ `grade = double 4.0;`
- f. ☐ `double grade = 4.0;`

Exercise 6: Variable assignment syntax

Suppose you have a variable named `grade`, set to 1.6:

```
double grade = 1.6; // uh-oh
```

Suppose later in the program's code, we want to change the value of `grade` to 4.0. Which is the correct syntax to do this?

- a. ☐ `set grade = 4.0;`
- b. ☐ `double grade = 4.0;`
- c. ☐ `grade : 4.0;`
- d. ☐ `4.0 = grade;`
- e. ☐ `grade = 4.0;`

Exercise 7: a, b, and c

What are the values of a, b, and c after the following statements? Write your answer in the boxes on the right.

```
int a = 5;
int b = 10;
int c = b;

a = a + 1;           // a?
b = b - 1;           // b?
c = c + a;           // c?
```

Exercise 8: i, j, and k

What are the values of *i*, *j*, and *k* after the following statements?

```
int i = 2;  
int j = 3;  
int k = 4;  
int x = i + j + k;
```

<code>i = x - i - j;</code>	<code>// i?</code>	
<code>j = x - j - k;</code>	<code>// j?</code>	
<code>k = x - i - k;</code>	<code>// k?</code>	

Exercise 9: ComputePay

The following program redundantly repeats the same expressions many times. Download it and open it in jGRASP, then modify the program to remove the redundancy using **variables**. Use an appropriate type for each variable.

- [!\[\]\(a88007b249b36c75dcbde101f514cec3_img.jpg\) ComputePay.java](#)

The program's output should be the same after your modifications. No expression should be computed more than once in the code.

Exercise 10: Syntax errors

- The following program contains 9 mistakes! What are they? Copy and paste the following code into jGRASP and correct the various mistakes. The answer is on the next 2 slides if you need some help.

```
1 public class Oops {  
2     public static void main(String[] args) {  
3         int x;  
4         System.out.println("x is" x);  
5  
6         int x = 15.2;    // set x to 15.2  
7         System.out.println("x is now + x");  
8  
9         int y;           // set y to 1 more than x  
10        y = int x + 1;  
11        System.out.println("x and y are " + x + and + y);  
12    }  
13 }
```

answer on next slide...

Exercise 10 - answer

1. line 4: missing `+` between `"x is"` and `x`
2. line 4: cannot print the value of `x` before assigning it a value
3. line 6: cannot assign `15.2` into a variable of type `int`
4. line 6: should not redeclare the variable's type
5. line 7: `"` mark should be between `now` and `+`
6. line 10: should not write the word `int` here
7. line 10: variable `y` should be same type as `x`
8. line 10: does not properly set `y` to be 1 more than `x` (should not write the word `int` here)
9. line 11: `and` should be in quotes with surrounding spaces

Exercise 10 - corrected version

- Here is a corrected version of the program:

```
public class Oops {  
    public static void main(String[] args) {  
        double x = 0.0;  
        System.out.println("x is" + x);  
  
        x = 15.2;           // set x to 15.2  
        System.out.println("x is now " + x);  
  
        double y;           // set y to 1 more than x  
        y = x + 1;  
        System.out.println("x and y are " + x + " and " + y);  
    }  
}
```