CS 139 - Act 3a - Variables and data types

Objectives

Students will be able to:

- Identify which operations can change the value of variables
- Describe the role of declaration, assignment, and I/O operations
- Identify the Java structures corresponding to the above operations

Getting started

POGIL activities require each person in the group to take on a role. Required roles are the MANAGER, RECORDER, REPORTER. Optional roles include the REFLECTOR. See ppt for further explanation.

In your group, identify one MANAGER, RECORDER, REPORTER, and (optional) REFLECTOR as described below. If your group is only three people, identify only the first three.

MANAGER – Will keep the group on track. Will secure any needed material.

RECORDER – Will write down the group consensus answers to the questions on the GROUP worksheet.

REPORTER – Will report back to the class during discussion time.

REFLECTOR – Will record the exit pass information at the end of the session.

Manager –Distribute the individual activity sheet to all members of the group. Pick up one exit pass for your team.

Part 1 – Variables in Java

```
 1 // Documentation purposely eliminated in the interest of space
 2
 3 public class Variables
 4 {
 5     public static void main(String[] args)
 6     {
 7         int checking;
 8         byte miles;
 9         short minutes;
10         long days;
11         float total;
12         double sum;
13         boolean flag;
14         char letter;
15         String message;
16
17         checking = -20;
18         miles = 105;
19         minutes = 120;
20         days = 185000;
21         total = 7.98F;
22         sum = 5628.335;
23         flag = true;
24         letter = '9';
25         message = "Now why is my type in capital letters?";
26
27         System.out.println("We have made a journey of " + miles +
28                         " miles.");
29         System.out.println("It took us " + minutes + " minutes.");
30         System.out.println("Our account balance is $" + checking);
31         System.out.println("About " + days + " days ago Columbus " +
32                         "stood on this spot.");
33         System.out.println("Your total bill is " + total);
34         System.out.println("The sum of the scores is " + sum);
35         System.out.println("The flag is " + flag);
36         System.out.println("The letter is " + letter);
37         System.out.println(message);
38     }
39 }
```

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1. Which lines numbers contain declarations of variables?

2. In your own words, what is a declaration statement?

3. Which line numbers assign values to the variables?

4. There are a several things you need to know about Java variables (containers) and literals (values).
   a. Java is strongly typed. That means you cannot put a value into the container that is of a different type.
   b. Java will automatically "widen" a value of a type that can be expanded to another type. For example, an integer can be made into a double by adding a decimal point of 0 at the end.
   c. Java will **NOT** automatically "narrow" a value of a type that cannot fit into that type. For example, if we tried to put a decimal number into an integer container, the Java compiler will report an error. (There is a way to narrow the value explicitly, but we'll deal with that later.)
   d. A literal number without a decimal point is considered to be of *int* type. A decimal number is considered to be of *double* type.
   Given the above rules, which of the following statements are valid for the declarations and values provided?

		OK or NO
a.	checking = 56000;	
b.	total = 0;	
c.	sum = total:	
d.	total = sum;	
e.	checking = miles;	
f.	sum = checking;	
g.	sum = days;	
h.	days = "0";	

5. Based on your textbook reading, which of the following variable names are illegal in Java and why?
dayOfWeek, 3dGraph, june1997, mixture#3, week day

MANAGER – Have your group put their response sheets and **Exit Pass** in the team folder and clear the board.