Objectives:

• types; type checking; simple java programs

• strings; input and output; truth tables

To do: Read course notes; Quiz #1 end of this week; MP1 due Monday

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1. Identify the following types from the literals:

-10 = int   0. = double   true = _____

4000000000L = _____   11f = _____   'c' = _____

Identify and fix these common mistakes:

• `int passed = score > 80;`

• `float x=0, y=1.5;`

• `boolean pleaseQuit; while(!pleaseQuit) { … }`

• `double score = 8 / 10;`

• `double average = count / total; // count,total are of type int`

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3. Wooden toy abstraction demo - Truth tables

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2. **Test your Java knowledge:**

T / F? A Java variable must always be declared with a type.

T / F? You cannot change the type of a variable.

T / F? Variable names often use camelCase.

T / F? A variable has a type, value, name and memory location(s).

T / F? A variable must be declared before it is assigned or read.

Write a single line of code to illustrate each of the following:

Variable Initialization:

Variable Declaration:

Variable Assignment:

Fix the following incorrect statements:

A variable of type 'char' holds one or more characters.

A character is 8 bits.

There are two Java integer representations.

There is one floating-point type: double.

A boolean variable has three states: 'true' 'false' 'unknown'.

Variable Memory Requirements

Name two Java types that use 8 bytes of storage:

Name two Java types that use 4 bytes of storage:

Name two Java types that use 2 bytes of storage:

4. Java as a high-level language: What happens 'under the covers' in the following code? How often do we read 'score' ? _____,
write to score? _____
How many bytes are used to hold the value of score?

```
int score=0;
score = score + 1;
if(score>0) ...
```

6. **Identify two examples of each of the following: local variables, operators, expressions, statements, literal values in this code:**

```
public class TrueLove {

    public static void main(String[] args) {

        boolean love = false;

        int petal = 0;

        while ( Math.random() <= 1. - 0.01 * petal ) {

            love = ! love;

            petal ++;

            if( love ) System.out.println( "Loves me" );

            else System.out.println( "Loves me not" );

        }

        System.out.println(petal + " petals picked");

    }
}
```

5. While talking to the nice people in the student ACM office at Siebel you accidentally signed up for the ACM-credit card and now you're behind on the payments. The ACM mob will not look for you until your arrears are greater than $12000. Currently you owe $1000 and the compound interest rate is 20% per month (this rate also increases by 5% per month). How many complete months remain before they knock on your door? Write some pseudo-code or Java code to determine when you should go into hiding.

6. Write the following programs (don't waste time writing the opening Class and Program statements, or writing out entire prompt text below):

Enter a string with exactly 5 characters. You typed:1234

Try again!

Enter a string with exactly 5 characters. You typed:12345

Yes!

....

Please enter a string where the first and last letters are the same.

You typed "abbA"

You win!

2. **Identify two examples of each of the following: local variables, operators, expressions, statements, literal values in this code:**

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

                boolean love = false;

                int petal = 0;

                while ( Math.random() <= 1. - 0.01 * petal ) {

                        love = ! love;

                        petal ++;

                        if( love ) System.out.println( "Loves me" );

                        else System.out.println( "Loves me not" );

                }

                System.out.println(petal + " petals picked");

        }

}
```

6. … continued

Enter a word that includes the substring 'ting' You entered: 'tingle'

Found 'ting' at position 1

7. Useful String methods 'subroutines' from pre-lecture reading ch2.3)

s1. _____ (s2) returns true if s1 and s2 have the same character sequence.

s1. _____ () the number of characters in s1.

s1. _____ (N) returns a *char* at position N

s1. _____ (N,M) returns a string from N[th] (inclusive) position up to but excluding M[th] position.

s1._____ (s2) returns an integer. If s2 occurs as a substring of s1, then the returned value is the starting position of that substring. Otherwise, the returned value is -1.

s1. _____ () returns a new string with lower case letters converted to upper case.