Announcements

• Today is the last day for schedule adjustment
• Project #0 due Wednesday 9/12
Last Primitive Type (Boolean)

- boolean

Examples:

```java
boolean result = true;
boolean state = false;
boolean hasFever = (temperature > 98.6);
```
Summary – 8 Primitive Types

Variables for whole numbers:
  long magnitude = 10500123971L;
  int length = 705;
  short height = 25;
  byte age = 22;

Variables for floating point numbers:
  double weight = 52.37;
  float GPA = 3.98F;

Others
  char symbol = ‘&’;
  boolean onFire = true;
Demonstration (BasicTypes.java)

Let’s see how to create a new project in Eclipse.

Points to raise:

• How to create a new Project
• How to create a new class (including a stub for main method)
• Declaring more than one variable in a statement
• What about spaces and blank lines?
• Proper indentation
Example: TypeProblems.java

You can’t usually mix types in Java!

Points to raise:

• Conversions between numerical types
• Distinction between char and String
• In Eclipse: Errors are in red, warning are in yellow
Arithmetic Operators

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>add</td>
</tr>
<tr>
<td>-</td>
<td>subtract</td>
</tr>
<tr>
<td>/</td>
<td>divide</td>
</tr>
<tr>
<td>*</td>
<td>multiply</td>
</tr>
<tr>
<td>%</td>
<td>modulus</td>
</tr>
</tbody>
</table>

• Order of precedence?

Evaluate:

\[ 8 / 4 \times 2 \]
Escape Sequences

Try writing a program that prints on the console:

```
I said "hi."
```

Common escape sequences for String literals:

<table>
<thead>
<tr>
<th>Escape Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;</td>
<td>Quotation mark</td>
</tr>
<tr>
<td>\n</td>
<td>New line</td>
</tr>
<tr>
<td>\t</td>
<td>Tab</td>
</tr>
<tr>
<td>\</td>
<td>One slash</td>
</tr>
</tbody>
</table>
Example:  IntegerDivision.java

What is the result of division of two integers in Java?
Example:

What is the value of the expression 28/6
## Comparison Operators

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;</td>
<td>Less than</td>
</tr>
<tr>
<td>&gt;</td>
<td>Greater than</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less than or equal to</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater than or equal to</td>
</tr>
</tbody>
</table>

The following are “boolean expressions”:

- $7 < 12$
- $8 > 50$
- $2 \leq 7$
- $2 \leq 2$
- $x < 50$
- $y \geq z$
Equality Operators

<table>
<thead>
<tr>
<th>Operator</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>==</td>
<td>Equality</td>
</tr>
<tr>
<td>!=</td>
<td>Not equal to</td>
</tr>
</tbody>
</table>

The following are “boolean expressions”:

\[
7 \; == \; 12 \\
7 \; != \; 12 \\
x \; == \; 5 \\
z \; != \; y
\]
Example: EqualityWithObjects.java

String a = myScanner.next();
String b = myScanner.next();
System.out.println(a == b);

Results are probably not what you want. (We’ll see why later...)

IMPORTANT: == works with primitives. To compare two objects use

    a.equals(b)       // boolean expression