Topics: Selection (conditional) statement, the Math class, input

Reading (JV): Sec 2.7 (exclude the Random class), Sec 2.8, 3.0-3.2

Example 1: Temperature conversion, re-visited

Write a program to convert a user-entered temperature in degrees Fahrenheit to degrees Celsius. Display the temperature both in °F and °C.

// Convert temperature from F to C

import cs1.Keyboard;

public class TempConvert {
    public static void main(String[] args) {
        final int FREEZE = 0;
        System.out.print("Enter temp in F: ");
        double tempF = Keyboard.readDouble();
        double tempC;
        tempC = (tempF-32)*5/9;
        System.out.println(tempF + " F is " + tempC + " C");

        if (tempC < FREEZE)
            System.out.println("So very cold!");
        else
            System.out.println("Tolerable");
    }
}

Conditional Statement

if (condition1)
    statement1;
else
    statement2;
else if (condition2)
    statement2;
else
    statement3;

At most one statement is executed; at most one else clause

Logical Operators

!    logical NOT
&&   logical AND
||    logical OR
**User Input**

See Lewis & Loftus Sec 2.7 for details on the **Keyboard** class.

Examples:

```java
var1 = Keyboard.readInt();
var2 = Keyboard.readDouble();
var3 = Keyboard.readChar();
var4 = Keyboard.readBoolean();
```

**The Math class**

A collection of basic mathematical functions. See Lewis & Loftus p. 84 for details.

```java
double tmp = Math.exp(1);
tmp = 3*Math.sin(2);
tmp = Math.random();
tmp = Math.floor(Math.random());
```

**Example 2: Shipping cost**

A shipping company calculates shipping prices as follows:

- A package weighing 5 lbs (pounds) or less costs $12, excluding tax.
- A package weighing over 5 lbs and less than 10 lbs costs $18, excluding tax.
- A package weighing at least 10 lbs costs $20 plus $1.50 for each pound over 10 lbs. For example, a 10.5 lb package costs $20.75 to ship, excluding tax.
- Tax (8%) is charged for shipment to Region 1. No tax is charged for shipment to Region 2.

Write a program segment that

- prompts the user for package weight (variable `wt`), destination code (variable `code`). Code will be entered as 1 or 2.
- calculates the shipping charge (including tax) and stores the result in variable `charge`
- prints the value of `charge` in a descriptive sentence.

```java
double charge;  // shipping charge

// Get the package weight and destination code
System.out.print("Enter the package weight: ");
double weight = Keyboard.readDouble();
System.out.print("Enter destination code (either 1 or 2): ");
int des_code = Keyboard.readInt();

// Calculate shipping charge without tax
if (weight<=5)
    charge = 12;
else if (weight<10)
    charge = 18;
else
    charge = 20 + 1.5*(weight-10);

// Add tax for destination code 1
if (des_code == 1)
    charge = charge + 0.08*charge;

System.out.println("The shipping charge (including tax) = $" +charge);
```