# System.out.println and print

println, in the System.out class, allows you to output a String.

```
System.out.println("Welcome to Vassar College!");
```

This method puts in a newline after printing the String.  You can use the line System.out.println(); with no String argument to put a blank line in your output.

System.out.print("This is a line with no newline after it.");
is a method that does not put in a newline. The problem with this is that it brings up the cursor immediately after the output.

# System.out.println and print

Inside the String argument to println, any variable concatenated to a String using the + operator is automatically turned into a String.

```
System.out.println("x is "+x+" and y is "+y);
```

At times, concatenating the empty String first causes all subsequent values to be converted to their String equivalent:

```
char beta = 'B';
String letters = ""; // set letters to empty string
letters += ""+beta+" ";
```

# System.out.printf

printf, in the System.out class, allows you to specify the number of places after the decimal point when printint a double. The printf method's first argument is a String that contains a *format string.* The format string is embedded in the String argument as %1.2f as shown below and in Section 2.4.1 of our textbook.

```
System.out.printf("Your BMI is %1.2f.\n", bMI);
```

The \n embeds a newline after the String is printed. The , separates the String with embedded format characters from the variable to be embedded in the String.

printf can be used to format any type of data.

# Scanner, Sect.2.4.6

Scanner is a class in the java.util package that provides methods that take input from the keyboard.  To use a Scanner to read from the keyboard (standard input), you need to instantiate an object of type Scanner.

```
Scanner in = new Scanner(System.in);
System.out.println("Please enter a number.");
double rnum = in.nextDouble();
System.out.printf
     ("Number in dollars is $%1.2f.\n", rnum);
```

The keyword new is used to create a new object of type Scanner.

The input is done by calling the nextDouble instance method of the new Scanner object.

System.in refers to the keyboard.

# JOptionPane

Class in the javax.swing package that provides another way of taking input from the keyboard.  To use a JOptionPane to read from the keyboard (standard input), you need to call a static method in the JOptionPane class.

```
String in = JOptionPane.showInputDialog
                ("Please enter a line of text");
```

This causes a pop-up dialog box to appear with a blank for input.

For output, use another static method from the JOptionPane class:

```
JOptionPane.showMessageDialog
                (null,"The answer is 42");
```

null is the default value for any object type. In graphics programs, this is often a JFrame.