

COMP 170 Week 4 Lab

Do a variation of Practice Program 3, but using a loop, and also do Chapter 4 Practice Programs 3, 5, and 8

Start with any existing program you like or create these from scratch:

- Use a counter-controlled *for* loop to read in a number of Strings based on a constant (**final int**) called **NUM_STRINGS** you set to **3**. (If you want, you can ask the user how many.) As you're processing the Strings, keep track of the largest one you have seen so far – use String method ***compareToIgnoreCase()*** to compare one String to another; you can start with the empty String, "", which is smaller than all other Strings. At the end of the program print out how many Strings you saw and the largest one. *Save as LargestString.java*
3. (from Chapter 4) Perform temperature conversion in an ask-before-iterating loop: (*save as TemperatureConversion.java*) Repeat Chapter 3 Practice Program 5 that allows a user to convert temperatures. In an outer loop, prompt for a (*double*) temperature value and then prompt for C/c or F/f for the type of temperature, Celsius or Fahrenheit, using Scanner method ***next()***; if they enter something else, loop until they enter one of those values (a nested inner validation loop!), but do not ask them to repeat entering the temperature value. Once you know the type, use *if/else* or *switch* to convert it to the other type and print the result, using these formulas: $C = (5 * F - 32) / 9$ and $F = (9 * C / 5) + 32$. After printing the converted output, ask the user to type Q/q to quit, or to press any other key to repeat the outer loop and perform another conversion (it's OK to use ***break***; to end the outer loop if they type Q/q)

Week 4 Lab, continued:

5. Create [LargeSmallAverage.java](#), in a *sentinel-controlled* loop: Write a program to read a list of non-negative numbers and then print out the largest integer, the smallest integer, and the average of all of the integers that were entered. The user indicates the end of the input by entering any negative *sentinel* value, and that value must not be used in finding the largest, smallest, and average values. The average should be of type *double* so it is computed with a fractional part. Handle the case where the first value is the *sentinel* by printing an error message and not trying to calculate the average (which would cause a division by 0 runtime error).

8. Write a [Magic 8 Ball program](#), using random numbers: Write a program that simulates the Magic 8 Ball game by generating a random number that allows choosing one of the following 8 responses, then asks the user if they would like to repeat the program and loop if so (an *ask-before-iterating* loop). **This is an extra credit Lab exercise.**

The following Java statement generates a random number between 1 and 8:

```
int num = (int) (Math.random() * 8) + 1; // use in a switch
```

These are the 8 responses your program should randomly choose from and print out:

- 1. It is certain**
- 2. It is decidedly so**
- 3. Most likely**
- 4. Signs point to yes**
- 5. Reply hazy, try again**
- 6. Ask again later**
- 7. Don't count on it**
- 8. My sources say no**

[*Save as Magic8Ball.java*](#)

Show me how you have completed these exercises.