Lab 5 - Loops

**Instructions:** For this, and all following labs you will turn in a single .java file that has all of your code in their own methods. For each problem, create a **method** that solves that portion of the lab. Call that method from your main method. You can start with this code in your main method, or use it as an example to format your submission:

public class Lab5 {

public static void main(String[] args) {

// Menu system here

//if they selected problem 1

problem1(); // This runs the problem 1 method.

//if they selected problem 2

problem2(); // This runs the problem 2 method.

}

public static void problem1(){

//Code for problem 1 here.

}

public static void problem2(){

//Code for problem 2 here.

}

}

**Lab 5:**

**Problem 0** – complete this task in your main method:

Write a menu system for your program. To do this you will use a **while loop** to print the available options (the methods you will write) and ask the user to select which method they would like to run. Use a sentinel value to end the program.

Hint: A switch statement is easier to use here than a bunch of if statements.

Note: You will reuse this as the basis for most (if not all) of the other labs, so write it well!

**Problem 1**

Write a method that does the following:

Takes Input for temperatures and prints whether they are above or below freezing, counts and prints out a running total of the number of temperatures above and below freezing, prints the average temperature of all temperatures that have been entered so far, then asks user if they want to enter another temperature.

Hint: Remember to take this one piece at a time. It is easy to get lost in all of the details if you try to do it all at once. Make a plan before starting the code!

Tasks you should make sure you are doing:

|  |
| --- |
|  |
| Input validation |
| Correct calculations and output |
| Correctly output running total. |

**Problem 2**

Write a method with a while loop that repeatedly takes test scores (score values range from 0 to 100) input until the user decides to stop (pick a sentinel value to exit). Then print the total numbers of As, Bs, Cs, Ds, and Fs and the average test score. (You can use the 90/80/70/60 scale to determine letter grades.)

Tasks you should make sure you are doing:

|  |
| --- |
|  |
| Use a while loop |
| Input & data validation |
| Used sentinel value |
| Correct output |

**Problem 3**

Write a method that uses multiple loops to perform the following tasks. You must use at least 1 of each: while loop, do-while loop, and for loop. Each of the following sections will have their own loop:

* 1. Print 1...10
  2. Print 10..1
  3. Print 2..20, evens only
  4. Print “Hello” and then ask the user if they want to repeat this section (only THIS section, section d), print the total number of times they have repeated section d, continue until the user no longer wants to repeat this section. (This section doesn’t DO anything but count the number of times the user said to repeat it.)
  5. Output all the uppercase letters using a loop. (Hint: you don’t have to type them all yourself.)
  6. Prompt for a number and print "I love Java" that many times to the screen.

Tasks you should make sure you are doing:

|  |
| --- |
|  |
| Uses 1 of each type of loop |
| Correct output for all sections |
| Used sentinel value |

**Problem 4**

Write a method that uses a loop to prompt the user for the name of 5 destinations (you can choose anything here, addresses, cities, planets, etc.). Store these destination names in an array. Then use a second loop to print 3 random destinations from those entered, ensuring that you do not repeat the same destination.

Things to consider:

How do you get a random number? (We’ve briefly talked about this but you’ll need to look it up.)

How do you keep track of what you have printed already so you don’t print it again? This can be some tricky logic. If you get stuck, think about an example from real life – you had 5 outfits to wear for the 3-day weekend and randomly picked them, how could you keep track of which ones you plan on wearing so you don’t wear the same one twice?

(Notice the problem solving steps? Finding an example I know you know how to solve and adapting that to code. I swear this stuff works if you remember to use it.)

Tasks you should make sure you are doing:

|  |
| --- |
|  |
| Uses more than one loop |
| Uses more than one array |
| Outputs three random destinations |