IT 168
Fall, 2021
Califf

Programming Assignment 1

Due Date: 11:55 pm, Friday, September 10, 2021

This programming assignment is actually 2 small programs. They will be completed separately; then you will zip the 2 .java files into a single .zip file and submit it via ReggieNet to the program 1 assignment. You will also submit a PDF document with the test data for your programs. This assignment is worth 50 programming points: 30 for Problem 1 and 20 for Problem 2.

The Problems:

1. Write a program that creates a username and a secret code based on the user's first and last name, along with their phone number. Do each of the following steps in turn.
    a. Prompt the user for and read the user's first name and last name separately.
    b. Print a string composed of the first letter of the user's first name, followed by the first five characters of the user's last name, followed by a random number in the range 10 to 99.
    c. Output the username in all lowercase. You will then create a secret code number using the user's phone number.
    d. Prompt the user to enter a phone number, including the dashes.
    e. Create a code by taking the last four digits of the phone number, appending a random number from 100 to 999 and then appending the area code. Finally, replace all 6's in the secret code with **@**, all 3's with the letter **E**, and all 5's with the letter **S**: i.e., if the number is 309-452-6029 with a random number of 522 would give you 6029522309. Output the code. You must use String methods to find the correct portions of the number. You must search for the second dash in the phone number to retrieve the last four numbers of the phone number.

Sample input and output(user input in bold):

```
Enter your first name: Susan
Enter your second name: Johnson
Enter your phone number with dashes- xxx-xxx-xxxx: 309-456-6875
Random number: 94
The username is: sjohns94
Random number: 268
Your secret code is: @87S2@8E09
```

Remember that the random numbers will generate different values than what is displayed here.

Name your program **UserSecretCode.java.** Make sure your output matches the format above. Input will come from the keyboard using the Scanner class. Output will be displayed on the console.

In the file Program 1 Test Data.docx, enter data for three different names and phone numbers. Where random numbers are output, put X's as placeholders for the randomly generated data. Make sure your program works correctly for each of the test cases.

2. Write a program that calculates the distance between two points. You will use the formula:

$$Distance = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Prompt the user for two x integer values and two y integer values and then display the distance based on these two points.

Sample output(user input in bold):

```
Enter the first x value: 5
Enter the first y value: 12
Enter the second x value: 18
Enter the second y value: 25
The distance of (5,12) and (18,25) is 18.38.
```

Note: The output distance must contain only two decimal places, so you will have to use number formatting.

Name your program **Distance.java**. Use a named constant for the exponent (2) that is used in the formula and use this named constant within your expression. Make sure your output matches the format above.

In the file Program 1 Test Data.docx, enter three sets of points and the correct output for each. Make sure your program works correctly for each of your test cases.

General Instructions and Hints:
Your files must start with beginning comment blocks as specified in the coding guidelines for this course. The code should be well documented.

Make sure you use meaningful variable names that follow the Java naming conventions.

Once you have filled in your TestData table, export it to a PDF file. You will attach the PDF file to your Programming Assignment 1 submission in ReggieNet.

Hints:

- Remember that the first index in a string is 0 and the last index in the string is the length of the string -1.
- To get a random number that starts with a number other than 0, decrease the stop value by the same amount as you are starting with and then add to the final number by the same amount. For example, if you want a number from 1 to 10, retrieve the numbers 0-9 and then add 1 to the result.

Submission:
You will attach two files to the assignment in ReggieNet. One will be a .zip file containing your two .java files. The other will be the completed Program 1 Test Data.pdf (exported from Program 1 Test Data.docx).

Program Grading Criteria

Base Grade

90%	• Includes all program structure needed to complete the assignment with no logical errors • Has meaningful and conventional names for most variables, methods, and classes • Produces output completely matching the project specification
80%	• Incudes all program structure needed to complete the assignment, possibly with some logical errors • Has meaningful and conventional names for most variables, methods, and classes • Produces output matching the project specification with one or fewer errors or omissions.
70%	• Successfully accomplishes some program steps needed to complete the project. • Uses appropriate variables, operations, and classes. • Produces at least some output meeting the project requirements.
60%	• Is a recognizable attempt to meet the project requirements. • Includes variables, operations, and classes that relate to the project requirements. • Compiles and runs.

Adjustments (in percentages – actual adjustment will be made in a minimum of 0.5 point increments)

Deductions		Additions	
-10	Compiler error	+5	All test cases produce correct output
-10	Has no commenting	+5	Meets full formatting requirements (header comments, braces, indentation)
-5	Runtime error		
-2 ea.	Incorrect variable type		
-2 ea.	Variable when constant indicated		
-1 ea.	Naming convention violation		