Java for Non Majors

CGS 3416: Spring 2016

Homework 3: 100 points

Due date: 11:59 PM 02/13/2016

Objective

The purpose of this assignment is to test your proficiency with Java I/O statements, switch statements, Java strings and Java libraries. It will also serve to check if you can integrate older concepts with newer ones.

For this assignment you are required to write two programs. Please email your files `"Card.java"` and `Trig.java` to `jayarama@cs.fsu.edu`

Problem 1 - Card Generator

The great exalted Preston Hamlin is planning on playing Blackjack on ACM game night. Unfortunately, he has forgotten to bring the cards. Not deterred by such minor details, Preston calmly hires you to write a random card generator as a Java Console application. This card generator generates one card per turn. It translates two random values into a card and prints it.

Specifications

- This program is worth 50 points, and is called `Card.java`.
- Create a class with the appropriate name. All of the code should be in the main method. (5 points)
- Create variables for the suit, the number and the value of the card. (5 points)
- Use the Java Random library to generate two numbers. For the number, generate a number in the range [1,13]. For the suit, generate a number in the range [1,4]. These numbers must be integers. (10 points)
- Use a switch structure to translate the number of the card and store the number followed by the literal string "of" in the variable for value. For example, 4 translates to "Four". Similarly, 1 is "Ace", 11 is "Jack", 12 is "Queen" and 13 is "King". The number cards retain their numbers. (10 points)
- Use another switch structure to determine the suit. Here, 1 is "Spades", 2 is "Clubs", 3 is "Hearts" and 4 is "Diamonds". Concatenate the suit to the end of the value variable. (10 points)
- Print the value of the card you just generated. (5 points)
- Please include comments wherever appropriate. (5 points)

Sample Runs

This program has no user input.

Sample Run 1

```
Hi!!
The card generated was the Seven of Diamonds.
```

Sample Run 2

```
Hi!!
The card generated was the Queen of Spades.
```

Problem 2 - Trigonometric Functions

Poe Dameron is in trouble. He has lost his trusty droid BB-8 on Jakku. In order to keep up his reputation as the best pilot in the resistance, he should be able to calculate the relative 3 dimensional velocities of enemy spacecraft and obstacles. However, Poe is not very skilled in trigonometry, which is essential for these calculations, and he no longer has BB-8 to pick up the slack. He has hired you to write a Java Console application to calculate the sine, cosine and tangent values for a given angle. To complicate things further, sometimes Poe thinks in degree and at other times in radians, so you would have to resolve that as well.

Specifications

- This program is worth 50 points, and is called `Trig.java`. You need to use the java.Math library for all of the math operations.
- Create a class with the appropriate name. All of the code should be in the main method. (5 points)
- Create variables for the angle and the unit. Read in the values from the user. (10 points)
- If the angle is in degrees, convert it to radians. Use if statements and string comparison. (10 points)
- Calculate and print the sine, cosine and tangent values accurate to 4 decimal digits. (20 points)
- Please include comments wherever appropriate. (5 points)

Sample Runs

Regular text is what's printed by your program. Underlined text is user input, shown here as a sample. You will not be printing the underlined parts in your program.

Sample Run 1

```
Please enter the angle:  56
Radians or Degrees?  degrees
Sine:  0.8290
Cosine:  0.5592
Tangent:  1.4826
```

Sample Run 2

```
Please enter the angle:  27
Radians or Degrees?  Radians
Sine:  0.9564
Cosine:  -0.2921
Tangent:  -3.2737
```

Generic Guidelines

- Please add your name and FSUID as comments on the top of your program.
- Please make sure youre only using the concepts already discussed in class. These assignments are used to determine if you passed a certain learning milestone. So, please follow the specifications. Using concepts that are not in the specifications will result in a score of 0 points for that particular specification.
- Please make sure that youre conforming to specifications (program name, expected inputs and outputs etc.). Your output must match the sample output exactly (especially the literal text on print statements).
- Please make sure your code is readable and well documented.
- Make sure to compile and run your program before you turn it in. Compilation errors can be costly.
- You can use an IDE for this assignment, but make sure your program compiles and runs on a terminal, since the program will be tested on a terminal.