CSC 115 Assignment #4 ***Due Wednesday, November 13 by 3:00 PM, PDT*** **via email only**

Question #1: Enhance question ***two***, from assignment #3 using Scratch such that graphics are added to the program. Specifically, draw both circles, as entered by the user, which will graphically show whether the circles overlap. Also perform error processing, i.e. if an improper radius or center is specified tell the user and re-prompt for the required input. Finally, your program ***shall*** output a message stating whether the circles are intersecting, are not intersecting, or are "kissing"; where kissing means the edge of both circles are touching, i.e. the distance between the centers of the circles is identical to the sum of the circles' radii.

Question #2: Write a program in both Scratch **and** Java that determines if a specific year is a leap year. The program shall perform input, in the form of a year and provide a response in English specifying that the year was either a leap year or was not a leap year. Be sure to support error checking. For example, the first leap year was 1752, so earlier years are invalid. As a second example, note that the year 2000 was a leap year, but 2100 is not a leap year.

Question #3: In either ***Scratch or Java*** write a program as defined below:

For this assignment you are to write a program that incorporates nearly everything we have learned thus far, including:

-Use of variables
-Assignment statements
-Counters
-Conditionals (if-statements)
-Loops (for-loops)
-Input
-Output
-Simple Random number generation

The program you are to write is a simple game called guesser; the object of the game is to guess a secret number that is between 1 and 100, inclusive. Your program is also to keep track of the number of turns it takes the user to guess the secret number, and print this value out when the user guess the correct code. If after ten turns the user cannot guess the secret code, your program should print out the secret code.

Below are two sample runs in Java; the runs would be similar in Scratch:

```
$ java guesser

Welcome to the guesser game where you attempt to guess
the secret number in as few a turns as possible.  For
each turn I will tell you if you are too low, too high,
or if you guessed the secret number.  I will also - tell you
the number of turns you took.

Enter guess: 50
Your guess is too low.
Enter guess: 75
Your guess is too high.
Enter guess: 62
Your guess is too high.
Enter guess: 56
Your guess is too low.
Enter guess: 59
Congratulations, turns required to find the secret number: 5

$ java guesser

Welcome to the guesser game where you attempt to guess
the secret number in as few a turns as possible.  For
each turn I will tell you if you are too low, too high,
or if you guessed the secret number.  I will also tell you
the number of turns you took.

Enter guess: 1
Your guess is too low.
Enter guess: 2
Your guess is too low.
Enter guess: 3
Your guess is too low.
Enter guess: 4
Your guess is too low.
Enter guess: 5
Your guess is too low.
Enter guess: 6
Your guess is too low.
Enter guess: 7
Your guess is too low.
Enter guess: 8
Your guess is too low.
Enter guess: 9
Your guess is too low.
Enter guess: 10

Your guess is too low.
The secret code was: 21
```

Notes:

1. Be sure to perform the necessary error checking
2. Include source code listings and sample runs for all three questions!