**CSC 110**

**Game with numeric systems**

**Objectives**:

* working with loops and if statements
* working with random numbers
* working with functions

**Program behavior**

This is a game that pits the user against the computer.  The program plays several rounds. During one round, the computer displays a random number between 1 and 100, either as a base-10 value or another base (from 2 to 9) value (chosen randomly). The computer gets a random number, the base of the numeric system and the game mode.

The game mode can be:

0 - convert numbers from the decimal system to another system,

1 - convert to the decimal system.

**The first example:**

the random number is 15, the number system is 2, the game mode equals 0. Hence the program prompts the user to convert the decimal number 15 to the binary system. The user enters the answer and if this answer is correct, the program gives the user one point and ask whether he/she wants to continue.

**The second example:**

the random number is 15, the number system is 2, the game mode equals 1. Hence the program converts the decimal number 15 to the binary system and displays this number. The user should convert this number to the decimal system and enter the answer, so if this answer is correct, the program gives the user one point and ask whether he/she wants to continue.

The game continues while the user answers “Yes”. Once the game is completed, the program should display a result, how many rounds, scores and grades in %.

**Program specifications**

* The program should begin with a brief user introduction of the game.
* The program should display the current round number before a round starts.
* After each round, the program should display how many rounds the user has gotten right or wrong.
* I'm not going to specify what functions you should including in your solution. The only requirement is that you do design a program that uses functions. I recommend you write functions for converting numbers and for counting scores and printing the result, that will compare numbers and calculate scores.
* Part of your score is how well your program uses functional decomposition.
* When the user needs to enter a binary number, they only need to enter the sequence of 0s and 1s. For example, if the user wanted to enter the number 5 in binary, they would enter 101
* You will need to use the function randint() or randrange() from the random module to generate a random mode.

**Suggestions**

* As always, I would suggest working on this program in pieces.
* There is a method in the Python library to convert from decimal to binary that you shouldn’t use, named [bin()](https://docs.python.org/3/library/functions.html#bin). You have to implement your own function to convert from decimal to another numeric system.

**Documentation and Other Style Issues**

* You should follow all of the commenting guidelines covered in the commenting guidelines.
* Use descriptive ***variable*** and ***function names*.**Remember to include block comments at the beginning of each function.
* This program has probably the most complex algorithm to date. Make sure to include algorithm comments in your solution.This doesn't mean you have to comment every line, but you might comment a block of code, like a control structure.
* You can use a global constant in this game (the winning score) This way, it is easy to modify the program to change that value.

**Written Report**

Please type up the answers to the following questions and include as a comment at the bottom of your .py file:

1. How did you go about starting this assignment?
2. During development, where did you get stuck, if at all, and how did you get unstuck?
3. How did you test your program? Does your program meet the homework specification? If not, in what ways does it fall short?
4. What did you learn from this assignment? What would you do differently next time?

**Examples for testing**

