CS-UY 1114 LAB 5, Spring 2018

Topics of this lab:
- Turtle
- For/While Loops
- Nested Loops

Pen and Paper Questions

1. What would be the output of this program?

```
k = 0
for i in range(10, -1):
        for j in range(2):
                k = k * 2
print(k)
```

2. What would be the output of this program?

```
mystery = 0
for i in range(10):
        if i % 2 == 0:
                mystery = mystery * 2
        if i % 3 == 1:
                mystery = mystery // 3
        else:
                mystery = mystery + 10
        print(mystery)
```

3. What would be the output of this program?

```
mystery = 0
for i in range(10, 0, -2):
        for j in range(5, 6):
                mystery = mystery + j - i
print(mystery)
```

Programming Questions

1. Write a program that ask the user for a number, then displays the following pattern using nested loops and the number entered by the user.

Example Output:

```
Please enter a number: 5
1
12
123
1234
12345
```

2. Write a program that asks the user to enter an integer n, then produce the following output.

Example Output:

```
Please enter a number: 5
....1
...22
..333
.4444
55555
```

3. The Hamming Distance is the number of positions at which the corresponding symbols between two strings of equal length is different. For example:

The Hamming Distance between 123<u>4</u> and 123<u>5</u> is 1
The Hamming Distance between 3<u>1</u>2<u>5</u>0 and 3<u>2</u>1<u>5</u>0 is 2
The Hamming Distance between 123 and 123 is 0

Ask the user for 2 numbers. Then calculate the Hamming Distance between the two strings. Assume the length of both strings entered by the user is always the same. **<u>Use only knowledge from the following topic: for range loop, div and mod</u>**

Example Output:

```
Please enter the first number: 5342
Please enter the second number: 3343
The Hamming Distance between 5342 and 3343 is 2
```

4. Write a program that asks user to input an integer *n* and draw a *n*-gon of equal sides with Turtle. Assume side length is 100 px.

Hint: The equation for calculating sum of all interior angles is: S = (n – 2) * 180

5. Write a random number game. The program would generate a random integer between 1 and 100 (inclusive). The user will continue to guess what the number is until the user entered the correct number.

Your program should start by generate a random number between 1 and 100. Then you should input an integer and the computer would print out if the randomly generated number is bigger or smaller than user's guess. The user will have to keep guessing until the user guessed the number.

Example Output

```
I thought of a number between 1 and 100!

Try to guess what it is: 10
Wrong guess. My number is bigger than yours
Try to guess what it is: 20
Wrong guess. My number is bigger than yours
Try to guess what it is: 30
Wrong guess. My number is bigger than yours
Try to guess what it is: 70
Wrong guess. My number is smaller than yours
Try to guess what it is: 60
Wrong guess. My number is smaller than yours
Try to guess what it is: 50
Wrong guess. My number is smaller than yours
Try to guess what it is: 45
Wrong guess. My number is bigger than yours
Try to guess what it is: 48
Wrong guess. My number is smaller than yours
Try to guess what it is: 47
Wrong guess. My number is smaller than yours
Try to guess what it is: 46
Congrats! You guessed my number!
```