# COME103 / CENG111 Computer Programming I

**Lab - 5** 7 November 2019

## 1. TRUE / FALSE QUESTIONS

_____A good way to repeatedly perform an operation is to write the statements for the task once and then place the statements in a loop that will repeat as many times as necessary.

_____In a nested loop, the inner loop goes through all of its iterations for each iteration of the outer loop.

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_____In order to draw an octagon with turtle graphics, you would need a loop that iterates eight times.

_____In a nested loop, the inner loop goes through all of its iterations for every single iteration of the outer loop.

## 2. COMPLETION QUESTIONS: Fill in the blanks.

**a)** The while loop is known as a(n) _____ loop because it tests the condition before performing an iteration.

**b)** The acronym _____ refers to the fact that the computer cannot tell the difference between good data and bad data.

**c)** A(n) _____ validation loop is sometimes called an error trap or an error handler.

**d)** The _____ function is a built-in function that generates a list of integer values.

## 3. ALGORITHM WORKBENCH QUESTIONS

**a)** Write a while loop that asks the user to enter two numbers. The numbers should be added and the sum displayed. The loop should ask the user if he or she wishes to perform the operation again. If so, the loop should repeat, otherwise it should terminate.

**b)** Write Python code that inputs three numbers from the screen. Code should do an input validation for the 3-entered numbers so that all of them are positive numbers. Otherwise it should ask to enter three of them again and again until all of the entered numbers are positive.

## MULTIPLE CHOICE QUESTIONS

**4.** GIGO stands for _____.

**a)** great input, great output

**b)** garbage in, garbage out

**c)** GIGahertz Output

**d)** GIGabyte Operation

**5.** Which of the following is not an augmented assignment operator?

**a)** *=

**b)** /=

**c)** +=

**d)** <=

**6.** A variable used to keep a running total is called a(n)_____.

**a)** Accumulator

**b)** Total

**c)** running total

**d)** Summer

**7.** _____ is the process of inspecting data that has been input into a program in order to ensure that the data is valid before it is used in a computation.

**a)** Input validation

**b)** Correcting data

**c)** Data validation

**d)** Correcting input

**8.** Which of the following represents an example to calculate the sum of numbers (that is, an accumulator), given that the number is stored in the variable number and the total is stored in the variable total?

**a)** total + number = total

**b)** number += number

**c)** total += number

**d)** total = number

**9.** What will be displayed after the following code is executed?

```
total = 0
for count in range(4,6):
    total += count
    print(total)
```

**a)**
```
4
9
```

**b)**
```
4
5
```

**c)**
```
6
4
```

**d)**
```
5
9
```

**10.** What will be displayed after the following code is executed?

```
for num in range(0, 20, 5):
    num += num
print(num)
```

**a)** 30
**b)** 25
**c)** 0 5 10 15 20
**d)** 5 10 15

**11.** What does the following program do?

```
student = 1
while student <= 3:
    total = 0
    for score in range(1, 4):
        score = int(input("Enter test score: "))
        total += score
    average = total/3
    print("Student ", student, "average: ", average)
    student += 1
```

**a)** It accepts 4 test scores for 3 students and outputs the average of the 12 scores.
**b)** It accepts 3 test scores for each of 3 students and outputs the average for each student.
**c)** It accepts 4 test scores for 2 students, then averages and outputs all the scores.
**d)** It accepts one test score for each of 3 students and outputs the average of the 3 scores.

## PROGRAMS

**12.** At one college, the tuition for a full-time student is $8,000 per semester. It has been announced that the tuition will increase by 3 percent each year for the next 5 years. Write a program with a loop that displays the projected semester tuition amount for the next 5 years.

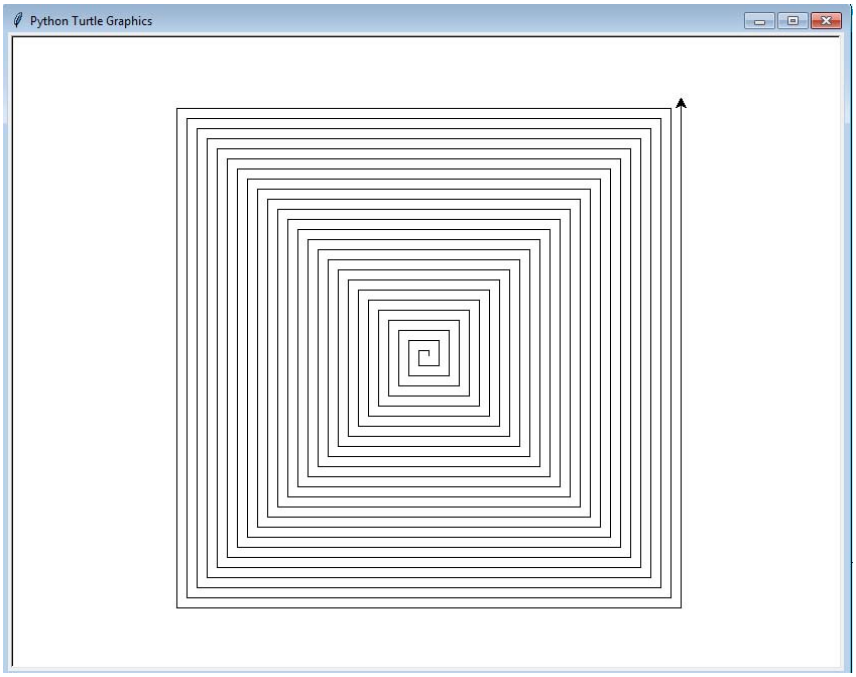
**13.** Conversion from kilograms to pounds and pounds to kilograms: Write a program that displays the following two tables side by side (note that 1 kilogram is 2.2 pounds and that 1 pound is .45 kilograms):

| kilograms | pounds | pounds | kilograms |
|---|---|---|---|
| 10 | 22.0 | 20 | 9.09 |
| 20 | 44.0 | 35 | 15.91 |
| 30 | 66.0 | 50 | 22.73 |
| 40 | 88.0 | 65 | 29.55 |
| 50 | 110.0 | 80 | 36.36 |
| 60 | 132.0 | 95 | 43.18 |
| 70 | 154.0 | 110 | 50.00 |
| 80 | 176.0 | 125 | 56.82 |
| 90 | 198.0 | 140 | 63.64 |
| 100 | 220.0 | 155 | 70.45 |

**14.** Displaying a number pattern by using loops: Use nested loops that display the following patterns in four separate programs:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

**15.** Use a loop with the turtle graphics library to draw the design shown in Figure.




**16.** Compute π : You can approximate by using the following series:

$$\pi = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \frac{1}{11} + \cdots + \frac{(-1)^{n+1}}{2n-1}$$

Write a program that displays the π value for *n* = 10000, 20000, . . ., and 100000.