PGR107 – Python Programming
Spring 2023
While Loop

1. Provide trace tables for these loops.

a.
```
i = 0
j = 10
n = 0
while i < j :
   i = i + 1
   j = j - 1
   n = n + 1
```

b.
```
i = 0
j = 0
n = 0
while i < 10 :
   i = i + 1
   n = n + i + j
   j = j + 1
```

c.
```
i = 10
j = 0
n = 0
while i > 0 :
   i = i - 1
   j = j + 1
   n = n + i - j
```

d.
```
i = 0
j = 10
n = 0
while i != j :
   i = i + 2
   j = j - 2
   n = n + 1
```

2. Using a **while loop**, write a program to print all squares less than **n** (which is entered by the user). For example, if n is 100, print 0 1 4 9 16 25 36 49 64 81.

3. Write a program, using **while loop**, that prints a Celsius/Fahrenheit conversion table such as the following using the formula: **C * (9/5) + 32 = F**

```
Celsius | Fahrenheit
--------+-----------
      0 |         32
     10 |         50
     20 |         68
  . . .       . . .
    100 |        212
```

4. Write a program that reads a student record, consisting of the student's first and last name, followed by a sequence of test scores and a sentinel of –1. The program should print the student's average score.

```
Harry
Morgan
94
71
86
95
-1
```

5. Write programs that read a line of input as a string and print
   a. Only the uppercase letters in the string.
   b. Every second letter of the string.
   c. The string, with all vowels replaced by an underscore.
   d. The number of digits in the string.
   e. The positions of all vowels in the string.

6. Write a program that reads a set of floating-point values. Ask the user to enter the values, then print
   - the average of the values.
   - the smallest of the values.
   - the largest of the values.
   - the range, that is the difference between the smallest and largest.

7. Write a program that reads a word and prints each character of the word on a separate line. For example, if the user provides the input "Harry", the program prints

```
H
a
r
r
y
```

8. Write a program that reads a word and prints the word in reverse. For example, if the user provides the input "Harry", the program prints

```
yrraH
```