Assignment 3 :- Python Loops

1. What are the Loop Control Statements in Python?

In [ ]:
```
Break :
        The break statement used to terminates the loop and transfer control to the next statement.

Continue :
        The continue statement skip the current iteration of the loop and moves to the next iteration.

Pass :

       The pass statement is a no-operation statement.
```

2. What is the Python syntax for a for loop?

In [ ]:
```
for variable in iterable:
    statement 1
    statement 2
    statement 3
    .
    .....
    statement n
```

3. What is the Python syntax for a While loop?

In [ ]:
```
while condition == True:
    statement 1
    statement 2
    statement 3
    .
    ....
    statement n
```

4. What are the advantages of using a for loop in Python?

In [ ]:
```
Loops is the best way to do the same program without writing the same code repeatedly.
simplifies creation of lists,set and dictionaries with comprehensions.
It can iterates over any iterable, like list, string, dictionaries.
```

5. what is the difference between the continue and break statements in Python?

In [ ]:
```
Continue :
        continue statement is used to skip certain iterations without exiting the loop.
        skip the specific conditions and continue the loop.

Break :
        break statement is used when we want to stop the loop under certain conditions.
        this is used to completely stop a loop for a specific condition.
```

6. What is For Else and While Else in Python?

In [ ]:
```
in for loop else block is run after the whole loop is finished.
if break statement occurs in for loop then the else block is skipped.

in while loop else block is runs after the loop's condition becomes false.
if the loop is exited via a break statement, the else block is skipped.
```

7. Python program to calculate the sum of all the odd numbers within the given range.

In [3]:
```
odd_sum = 0
for i in range(1,99):
    if i%2 != 0:
        odd_sum += 1
print(odd_sum)
```

```
49
```

8. Python program to print a multiplication table of a given number

In [7]:
```
x = 9
for i in range(1,11):
    print(f'{x}*{i}={x*i}')
```

```
9*1=9
9*2=18
9*3=27
9*4=36
9*5=45
9*6=54
9*7=63
9*8=72
9*9=81
9*10=90
```

9. Python program to count the total number of digits in a number.

In [8]:
```
x = 963258741
print(len(str(x)))
```

```
9
```

In [10]:
```
x = 963258741
y = str(x)
count = 0
for i in y:
    count += 1
print(count)
```

```
9
```

10.Python program to check if the given string is a palindrome.

In [15]:
```
x = "121"
for i in x:
    if x != x[::-1]:
        print(f"{x} is not palidrome number ")
        break

else:
    print(f"{x} is a palidrome number ")
```

```
121 is a palidrome number
```

In [16]:
```
x = "PythonandDataScience"
for i in x:
    if x != x[::-1]:
        print(f"{x} is not palidrome number ")
        break

else:
    print(f"{x} is a palidrome number ")
```

```
PythonandDataScience is not palidrome number
```

In [19]:
```
x = "333666999666333"
for i in x:
    if x != x[::-1]:
        print(f"{x} is not palidrome number ")
        break

else:
    print(f"{x} is a palidrome number ")
```

```
333666999666333 is a palidrome number
```

11. Python program that accepts a word from the user and reverses it.

In [20]:
```
x = str(input("Enter the word: "))

for i in x[::-1]:
    print(i,end='')
```

```
olleH
```

12.Python program to check if a given number is an Armstrong number

In [21]:
```
x = int(input("Enter the number: "))

y = str(x)
z = len(y)
armstrong_num = 0
for i in y:
    armstrong_num += int(i)**z
    if armstrong_num == x:
        print(f'{x} is armstrong number')
        break
else:
    print(f'{x} is not armstrong number')
```

```
987 is not armstrong number
```

In [22]:
```
x = int(input("Enter the number: "))

y = str(x)
z = len(y)
armstrong_num = 0
for i in y:
    armstrong_num += int(i)**z
    if armstrong_num == x:
        print(f'{x} is armstrong number')
        break
else:
    print(f'{x} is not armstrong number')
```

```
370 is armstrong number
```

13.Python program to count the number of even and odd numbers from a series of numbers.

In [26]:
```
x = [0,1,2,3,4,5,6,7,8,9]
even = 0
odd = 0
for i in x:
    if i%2 == 0:
        even += 1
    else:
        odd += 1

print(f'Even Numbers : {even}\nOdd Numbers : {odd}')
```

```
Even Numbers : 5
Odd Numbers : 5
```

14. Python program to display all numbers within a range except the prime numbers.

In [30]:
```
non_prime_list = []
for num in range(2,51):
    for i in range(2,num):
        if num % i == 0:
            non_prime_list.append(num)
            break

print(non_prime_list)
```

```
[4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 36, 38, 39, 40, 42, 44,
45, 46, 48, 49, 50]
```

15. Python program to display all prime numbers within a range.

In [31]:
```
prime_num_list = []
for num in range(2,31):
    for i in range(2,num):
        if num % i == 0:
            break
    else:
        prime_num_list.append(num)

print(prime_num_list)
```

```
[2, 3, 5, 7, 11, 13, 17, 19, 23, 29]
```

16. Python program to get the Fibonacci series between 0 to 50.

In [32]:
```
n = 50
Fibonnaci_series = [0,1]

for i in range(2,n+1):
    x = Fibonnaci_series[-1]+Fibonnaci_series[-2]
    Fibonnaci_series.append(x)
print(Fibonnaci_series)
```

```
[0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657,
46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269, 2178309, 3524578, 5702887, 9227465, 14930352, 241
57817, 39088169, 63245986, 102334155, 165580141, 267914296, 433494437, 701408733, 1134903170, 1836311903, 297121
5073, 4807526976, 7778742049, 12586269025]
```

17. Display Fibonacci series up to 7 terms

In [33]:
```
n = 12
Fibonnaci_series = [0,1]

for i in range(2,n+1):
    x = Fibonnaci_series[-1]+Fibonnaci_series[-2]
    Fibonnaci_series.append(x)
print(Fibonnaci_series[0:7])
```

```
[0, 1, 1, 2, 3, 5, 8]
```

18. Python program to find the factorial of a given number.

In [34]:
```
n = int(input("Enter the number :"))
fact = 1
for i in range(1,n+1):
    fact *= i
print(fact)
```

```
362880
```

19. Python program that accepts a string and calculates the number of digits and letters.

In [35]:
```
x = str(input("Enter the string :"))
digits = 0
letter = 0
for i in x:
    if i.isdigit():
        digits += 1
    else:
        letter += 1

print("Digits :", digits)
print("Letter :", letter)
```

```
Digits : 3
Letter : 6
```

20. Python program to convert the month name to a number of days.

In [37]:
```
months = {"January": 31,
          "February": 28,
          "March": 31,
          "April": 30,
          "May": 31,
          "June": 30,
          "July": 31,
          "August": 31,
          "September": 30,
          "October": 31,
          "November": 30,
          "December": 31}

month = input("Enter a Month :")
days = months[month]
print(f'In a month {month} Number of days is {days} ')
```

```
In a month June Number of days is 30
```

21. Write a Python Program to print below Patterns using For and While Loop:

In [77]:
```
""" 1.
*
* *
* * *
* * * *
* * * * *
"""

n = 6  #number of lines
for i in range(1,n):
    print("* " * i)
```

```
*
* *
* * *
* * * *
* * * * *
```

In [ ]:
```

```

In [79]:
```
""" 2.
        *
      * *
    * * *
  * * * *
* * * * *
"""

n = 6
for i in range(1,n):
    print("  " * (n-i),"* "*i,end=" ")
    print()
```

```
          *
        * *
      * * *
    * * * *
  * * * * *
```

In [81]:
```
""" 3.
    *
   * *
  * * *
 * * * *
* * * * *
"""

n = 6
for i in range (1,n):
    print(" "*(n-i),"* "*i,end=" ")
    print()
```

```
     *
    * *
   * * *
  * * * *
 * * * * *
```

In [57]:
```
""" 4.
    *
   ***
  *****
 *******
*********
"""

counter = 1
for i in range(1,6):
    print("   " * (n-i)," * "*counter)
    counter += 2
```

```
                *
              *  *  *
            *  *  *  *  *
          *  *  *  *  *  *  *
        *  *  *  *  *  *  *  *  *
```

In [82]:
```
for i in range(1,6):
    print(" "*(n-i)+'*' * (2 * i - 1))
```

```
    *
   ***
  *****
 *******
*********
```

In [70]:
```
""" 5.
*********
 *******
  *****
   ***
    *
"""

counter = 9
for i in range(1,6):
    print("   " * (n+i), " * "*counter)
    counter -= 2
```

```
                    *  *  *  *  *  *  *  *  *
                       *  *  *  *  *  *  *
                          *  *  *  *  *
                             *  *  *
                                *
```

In [83]:
```
for i in range(6,0,-1):
    print(" "*(n-i)+'*' * (2 * i - 1))
```

```
***********
 *********
  *******
   *****
    ***
     *
```

In [86]:
```
""" 6.
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
"""

for i in range(1,6):
    x=1
    for j in range(i):
        print(x,end=" ")
        x += 1
    print( )
```

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

In [88]:
```
""" 7.
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
"""

count_no = 1
for i in range(1,6):
    for j in range(1, i + 1):
        print(count_no, end=" ")
        count_no += 1
    print()
```

```
1
2 3
4 5 6
7 8 9 10
11 12 13 14 15
```

In [ ]:
```
""" 8. Write a Python program to print Pascal’s Triangle
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
"""
```

In [ ]:

In [90]:
```
""" 9.
A
B B
C C C
D D D D
E E E E E
"""

n = 5
x = 65
for i in range(1,n+1):
    for j in range(i):
        print(chr(x),end=' ')
    x+=1
    print()
```

```
A
B B
C C C
D D D D
E E E E E
```

In [91]:
```
""" 10.
A
B C
D E F
G H I J
K L M N O
"""

n = 5
x = 65
for i in range(1,n+1):
    for j in range (i):
        print(chr(x),end=" ")
        x+=1
    print( )
```

```
A
B C
D E F
G H I J
K L M N O
```

In [92]:
```
"""11.
K
K K
K K K
K K K K
K K K K K
"""

n = 5
x = 75
for i in range(1,n+1):
    for j in range (i):
        print(chr(x),end=" ")

    print( )
```

```
K
K K
K K K
K K K K
K K K K K
```

In [93]:
```
"""12.
A
A B
A B C
A B C D
A B C D E
"""

n=5
for i in range(1,n+1):
    x=65
    for j in range (i):
        print(chr(x),end=" ")
        x+=1
    print()
```

```
A
A B
A B C
A B C D
A B C D E
```

In [94]:
```
"""13.
P
Py
Pyt
Pyth
Pytho
Python
"""

s = "Python"
for i in range(len(s)):
    print(s[0:i+1])
```

```
P
Py
Pyt
Pyth
Pytho
Python
```

In [95]:
```
"""14.
1 1 1 1 1
2 2 2 2
3 3 3
4 4
5
"""

n = 5
x = 1
for i in range(n,0,-1):
    for j in range(i):
        print(x,end=" ")
    x+=1
    print( )
```

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

In [96]:
```
"""15.
6 6 6 6 6 6
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
"""

n = 6
x = 6
for i in range(n,0,-1):
    for j in range(i):
        print(x,end=" ")
    x-=1
    print( )
```

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

In [97]:
```
"""16.
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
0
"""

n = 6
for i in range(n,0,-1):
    x=0
    for j in range(i):
```

```
        print(x,end=" ")
        x+=1
    print( )
```

```
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
0
```

In [98]:
```
"""17.
1
2 3 4
5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25
"""

n = 9
x = 1
for i in range(1,n+1):
    if i%2!=0:
        for j in range(i):
            print(x,end=" ")
            x+=1
        print( )
```

```
1
2 3 4
5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25
```

In [99]:
```
"""18.
6 5 4 3 2 1
5 4 3 2 1
4 3 2 1
3 2 1
2 1
1
"""

n = 6
for i in range(n,0,-1):

    for j in range(i,0,-1):
        print(j,end=" ")

    print( )
```

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

In [100…
```
"""19.
1
3 3
5 5 5
7 7 7 7
9 9 9 9 9
"""

n = 5
x = 1
for i in range(1,n+1):
    for j in range(i):
        print(x,end=" ")
    x+=2
    print()
```

```
1
3 3
5 5 5
7 7 7 7
9 9 9 9 9
```

In [101…
```
"""20.
        1
      1 2
    1 2 3
  1 2 3 4
```

```
1 2 3 4 5
"""

n = 5
for i in range(1, n + 1):
    print(" " * (2 * (n - i)), end="")

    for j in range(1, i + 1):
        print(j, end=" ")
    print()
```

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

In [102…

```
"""21.
1 2 3 4 5
2 2 3 4 5
3 3 3 4 5
4 4 4 4 5
5 5 5 5 5
"""

for i in range(1,6):
    for j in range(1,6):
        if j<i:
            print(i,end=" ")
        else:
            print(j,end=" ")

    print()
```

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

In [103…

```
"""22.
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
"""

n=5
for i in range(1,n+1):
    for j in range(1,i+1):
        print(i*j,end=" ")

    print()
```

```
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
```

In [104…

```
"""23.
1
2 1
4 2 1
8 4 2 1
16 8 4 2 1
32 16 8 4 2 1
64 32 16 8 4 2 1
128 64 32 16 8 4 2 1
"""

n = 8
for i in range(1, n + 1):
    for j in range(i, 0, -1):
        print(2 ** (j - 1), end=" ")
    print()
```

```
1
2 1
4 2 1
8 4 2 1
16 8 4 2 1
32 16 8 4 2 1
64 32 16 8 4 2 1
128 64 32 16 8 4 2 1
```

In [105…

```
"""24.

*
**
***
****
*****
******
******
*****
****
***
**
*
"""

n=6
for i in range(1,n+1):
    print("*"*i,end=" ")

    print()
for i in range(n,0,-1):
    print("*"*i,end=" ")

    print()
```

```
*
**
***
****
*****
******
******
*****
****
***
**
*
```

In [ ]: