In [1]:
```
# Basic For loop
# Print numbers from 1 to 100

for i in range(1, 101) :
    print(i, end = ' ')
```

```
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 26 27 28 29 30 31 32 33
46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75
88 89 90 91 92 93 94 95 96 97 98 99 100
```

In [2]:
```
# Basic While Loop and if-else statement
# Print even numbers from 1 to 100

i = 1
while i <= 100:
    if i % 2 == 0:
        print(i, end = " ")
    i += 1
```

```
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62
88 90 92 94 96 98 100
```

In [3]:
```
# For Loop with step
# Print odd numebrs from 1 to 100

# Since 1 is known to be odd, a for loop is run with range from 1 to
for i in range (1, 100, 2):
    # At each iteration of the loop, i will only get odd values
    print(i, end = " ")
```

```
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61
7 89 91 93 95 97 99
```

In [4]:
```
# Do While loop
# Print numbers from 10 to 1

i = 10
# Infinite loop
while True:
    # This statement executes atleast once no matter the value of i
    # So, this implements do-while loop in Python
    print(i, end = " ")
    i -= 1
    # Checks for break condition
    if (i == 0):
        break
```

```
10 9 8 7 6 5 4 3 2 1
```

In [5]:
```
# Pattern Printing -> Number triangle using for loop and if-else state
# Non optimised

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

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

In [6]:
```
# Pattern Printing -> Number triangle using for loop with step and if
# Optimised and reversed

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

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

In [7]:
```
# Example 1: Print the first 10 natural numbers using for loop.
for i in range (1, 11):
    print(i, end = " ")
```

```
1 2 3 4 5 6 7 8 9 10
```

In [8]:
```
# Example 2: Python program to print all the even numbers within the g

low = int(input("Enter lower limit of range: "))
high = int(input("Enter higher limit of range: "))

if (low <= high):
    # Check if low is an even number or not
    if low % 2 != 0:
        # If low is odd, add 1 to make it even
        low += 1
    # Now, a for loop with step = 2 is used to directly get all the ev
    # numbers between low and high without further checking
    for i in range (low, high + 1, 2):
        print(i, end = " ")
else:
    print("Invalid range")
```

```
Enter lower limit of range: 1
Enter higher limit of range: 5
2 4
```

In [9]:
```
# Example 3: Python program to calculate the sum of all numbers from 1

num = int(input("Enter a number upto which sum is to be calculated: "
# A variable to store sum of required range of numbers
res = 0
# In for Loop
for i in range(1, num + 1):
    res += i
print("Required Sum (Using for loop): ", res)

# Without using for loop -> using sum() function instead
print("Required Sum (Using sum() function): ", sum(range(1, num + 1))
```

```
Enter a number upto which sum is to be calculated: 10
Required Sum (Using for loop):  55
Required Sum (Using sum() function):  55
```

In [10]:
```
# Example 4: Python program to calculate the sum of all the odd numbe

low = int(input("Enter lower limit of range: "))
high = int(input("Enter higher limit of range: "))

if (low <= high):
    # Check if low is an odd number or not
    if low % 2 == 0:
        # If low is even, add 1 to make it odd
        low += 1
    print("Required Sum: ", sum(range(low, high + 1, 2)))
else:
    print("Invalid range")
```

```
Enter lower limit of range: 5
Enter higher limit of range: 10
Required Sum:  21
```

In [11]:
```
# Example 5: Python program to print a multiplication table of a given
num = int(input("Enter a number: "))
for i in range(1, 11):
    print(num, " x ", i, " = ", num * i)
```

```
Enter a number: 10
10  x  1  =  10
10  x  2  =  20
10  x  3  =  30
10  x  4  =  40
10  x  5  =  50
10  x  6  =  60
10  x  7  =  70
10  x  8  =  80
10  x  9  =  90
10  x  10  =  100
```

In [12]:
```
# Example 6: Python program to display numbers from a list using a for
# Creating a list.
list = [1, 2, 3, 4, 5]
print("List elements are: ", end = "")
for i in list:
    print(i, end = " ")
```

```
List elements are: 1 2 3 4 5
```

In [13]:
```
# Example 7: Python program to count the total number of digits in a n
num = input("Enter a number: ")
print("Number of digits =", len(num))
```

```
Enter a number: 4675
Number of digits = 4
```

In [14]:
```
# Example 8: Python program to check if the given string is a palindro
str = input("Enter a string: ")
# Convert String to lowercase
str = str.lower()
print("Is Palindrome: ", str == str[::-1])
```

```
Enter a string: 121
Is Palindrome:  True
```

In [15]:
```
# Example 9: Python program that accepts a word from the user and reve
string = input("Enter a string: ")
print("Reversed String: ", string[::-1])
```

```
Enter a string: Hello World
Reversed String:  dlroW olleH
```

In [16]:
```
# Example 10: Python program to check if a given number is an Armstron
num = int(input("Enter a number: "))
sum = 0
# Creating a temporary variable with same value as num
temp = num
while temp > 0:
    sum += (temp % 10) ** 3
    temp //= 10
print("Is Armstrong: ", sum == num)
```

```
Enter a number: 153
Is Armstrong:  True
```

In [17]:
```
# Example 11: Python program to count the number of even
# and odd numbers from a series of numbers.
inputString = input("Enter a list of integers: ")
list = inputString.split()
list = [int(ele) for ele in list]

# Varibles to keep count of even numbers and odd numbers
countOdd = 0
countEven = 0
for ele in list:
    if ele % 2 == 0:
        countEven += 1
    countOdd += 1

print("Number of Even Numbers in given series: ", countEven)
print("Number of Odd Numbers in given series: ", countOdd)
```

```
Enter a list of integers: 5 7 8 9 10 11 19 20 30
Number of Even Numbers in given series:  4
Number of Odd Numbers in given series:  9
```

In [18]:

```
# Example 12: Python program to display all numbers within a range ex

# Function to check if a given number is prime or not
def checkPrime(num):
    if (num == 2):
        return True
    if (num <= 1):
        return False
    for i in range(2, (int) (num ** 0.5 + 1)):
        if num % i == 0:
            return False
    return True

# Get the lower and higher limit of range
low = int(input("Enter lower limit of range: "))
high = int(input("Enter higher limit of range: "))

if (high < low):
    print("Invalid range")

else:
    for i in range(low, high + 1):
        # If element is NOT PRIME, then print it
        if not checkPrime(i):
            print(i, end = " ")
```

```
Enter lower limit of range: 5
Enter higher limit of range: 15
6 8 9 10 12 14 15
```

In [49]:
```
# Example 13: Python program to get the Fibonacci series between 0 to
# First 2 elements of Fibonacci sequence are 0 and 1 respectively.
ele1 = 0
ele2 = 1

# Printing the first 2 elements
print(ele1, ele2, end = " ")
while ele1 + ele2 <= 50:
    print(ele1 + ele2, end = " ")
    # Changing ele1 and ele2 to represent the latest 2 elements of th
    ele1, ele2 = ele2, ele1 + ele2
```

```
0 1 1 2 3 5 8 13 21 34
```

In [20]:
```
# Example 14: Python program to find the factorial of a given number.
num = int(input("Enter a number: "))
# Check if the input number is -ve or not
if (num < 0):
    print("Invalid Number. Negative numbers do not have factorials")
# Check if input number is 0 or 1
elif (num < 2):
    print("Factoria = 1")
# Any number from 2 and above
else:
    fact = num
    for i in range(2, num):
        fact *= i
    print("Factorial =", fact)
```

```
Enter a number: 5
Factorial = 120
```

In [22]:
```
# Example 15: Python program that accepts a string and
# calculates the number of digits and letters
string = input("Enter a string")

# Variables to store count of alphabets and digits respectively
countLetter = 0
countDigit = 0

for char in string:
    # Checks is character is Alphabet
    if char.isalpha():
        countLetter += 1
    # Checks is character is Digit
    elif char.isdigit():
        countDigit += 1
print("Number of Letters / Alphabets =", countLetter)
print("Number of Digits =", countDigit)
```

```
Enter a stringHello123 World7878
Number of Letters / Alphabets = 10
Number of Digits = 7
```

In [23]:
```
# Example 16: Write a Python program that iterates the integers from 1
print("Iterating through: ", end = "")
for i in range(1, 26):
    print(i, end = " ")
```

```
Iterating through: 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 [28]:

```
# Example 17: Python program to check the validity of password input
# Import the regular expression module, this allows us to use the sea
from re import *
# Flag Variable for checking
valid = True
password = input("Enter your password: ")
if (len(password) < 8):
    valid = False
# Checks if previous cases are valid and the password contains lowerca
if (not valid and not search("[a-z]", password)):
    valid = False
# Checks if previous cases are valid and the password contains upperca
if (not valid and not search("[A-Z]", password)):
    valid = False
# Checks if previous cases are valid and the password contains digit
if (not valid and not search("[0-9]", password)):
    valid = False
# Checks if previous cases are valid and the password contains upperca
if (not valid and not search("[A-Z]", password)):
    valid = False
# Checks if previous cases are valid and the password contains specia
if (not valid and not search("[_@$]", password)):
    valid = False

if valid:
    print("Your password is Valid")
else:
    print("Your password is NOT Valid")
```

```
Enter your password: Hello@123
Your password is Valid
```