Control Structures

Programming often involves examining a set of conditions and deciding which action to take based on those conditions. Python's if statement allows you to examine the current state of a program and respond appropriately to that state.

Decision Making - (if - else) Statement

Ex. WAP to check entered number is even or odd (if - else)

In [4]:

```
x = int(input("Enter a no: "))
if (x % 2) == 0:
    print(x, " is an even no")
else:
    print(x, " is an odd no")
```

```
Enter a no: 5
5  is an odd no
```

Ex. Grade system example (if - elseif - else (Ladder))

In [5]:

```
marks = int(input("Enter your marks:"))
if (marks >= 75):
    print("You are passed in distinction")
elif (marks < 75 and marks >= 60):  # use and or &
    print("You are passed in First Class")
elif (marks < 60 and marks >= 40):
    print("You are passed in Second class")
else:
    print("You are failed in your exam")
```

```
Enter your marks:60
You are passed in First Class
```

Ex. Print largest of three numbers -- nested if..else

In [6]:

```
print("Enter three numbers")
a, b, c = int(input()), int(input()), int(input())

if(a==b and a==c):
    print("all r equal")

elif(a>b):

    if(a>c):
        print(a, "is largest")
    else:
        print(c, "is largest")

elif(b>c):
    print(b, "is largest")

else:
    print(c, "is largest")
```

```
Enter three numbers
3
5
7
7 is largest
```

Ex. check if a is present in string "Mumbai" -- Membership Operator (in)

In [7]:

```
if "a" in "Mumbai":
    print("Present")
else:
    print("Not present")
```

```
Present
```

Iteration - while

Ex. Find number of digits in a number and then find sum of digits of a number

In [12]:

```
num = int(input("Enter a number"))
sum = 0
count = 0

while num > 0:
    count += 1
    digit = num % 10
    sum += digit
    num = num // 10

print("No. of digits =", count, "and sum of digits=", sum)
```

```
Enter a number1234
No. of digits = 4 and sum of digits= 10
```

- Continue and break

Ex. WAP that keeps accpeting character from user till user enters 'q'

In [8]:

```
while True:
    ch = input("enter a character")
    if ch == 'q':
        break
print("end of program!")
```

```
enter a charactere
enter a characterw
enter a character5
enter a characterq
end of program!
```

Ex. WAP that prints all number from 1 to 50 skipping multipes of 3

In [11]:

```
x = 0
while x <= 50:
    x += 1
    if x % 3:
        print(x, end=" ")
    else:
        continue
```

```
1 2 4 5 7 8 10 11 13 14 16 17 19 20 22 23 25 26 28 29 31 32 34 35 37 38 40 4
1 43 44 46 47 49 50
```

Iteration - for

- range()

range(start, stop, step) - Return a virtual sequence of numbers from start to stop by step.

In [16]:

```
for i in range(10): # default start = 0, end = 9, default step = 1
    print(i, end= " ")
```

```
0 1 2 3 4 5 6 7 8 9
```

In [17]:

```
for i in range(1, 10): # start = 1, end = 9, default step = 1
    print(i, end= " ")
```

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

In [18]:

```
for i in range(1, 10, 2): # start = 1, end = 9, step = 2
    print(i, end= " ")
```

```
1 3 5 7 9
```

In [19]:

```
# Reverse numbering

for i in range(10, 0, -1): # start = 10, end = 1, step = -1
    print(i, end= " ")
```

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

Ex. Find factorial of a number

In [14]:

```
n=int(input("Enter a number : "))
fact=1
for i in range(1,n+1,1):
    fact *= i
print ("Factorial of",n,"is",fact)
```

```
Enter a number : 5
Factorial of 5 is 120
```