Flow control and Loop

Decision Making (if , if..else, Nested if, if-elif)

- if-Syntax:

```
if condition:
        # Statement1
        # Statement2
        …
Statement3…
```

```
# python program to illustrate if statement

i = 10

if (i > 15):
        print ("10 is less than 15")

print ("Not in if")
```

if..else

```
a = int ( input ( "Enter a number: " ) )
b = int ( input ( "Enter another number: " ) )
if a > b :
        print ( "First no is greater than second no" )
        print ("in if Block")
else :
        print ( "Second no is greater than first no" )
        print ("in else Block")
print (“not in if and not in else Block")
```

if..elseif

```
i = 20
if (i == 10):
        print ("i is 10")
elif (i == 15):
        print ("i is 15")
elif (i == 20):
        print ("i is 20")
else:
        print ("i is not present")
```

if..elseif

```
a = input("Enter a number: ")
b = input("Enter another number: ")
if a>b:
        print("First no is greater then Second no")
elif a==b:
        print(“Numbers are equal")
else:
        print("Second no is greater than First no")
```

Loops in python

- **While:**

Ex1:

```
# Single statement while block
while (count < 3): count = count + 1
```

Ex2:

```
count = 0
while (count < 3):
        count = count + 1
        print(“count = “, count)
```

Loops in python

- **while-else:**

- The else clause is only executed when your while condition becomes false.

- If you break out of the loop, or if an exception is raised, it won’t be executed.

```
count = 0
while (count < 3):
        count = count + 1
        print(“count = “, count)
else:
      print("In Else Block")
```

Loops in python

- **for examples:**

```
for i in range(1,10):
        print(i)

for i in range(1,10,2):
        print(i)

for i in range(10,5,-2):
       print(i)
```

Example

for loop:

```
for i in range(1,num + 1):
        factorial = factorial*i
```

Loops in python

- **for_else:**

```
for i in range(10,5,-2):
   print(i)
else:
   print("loop over")
```

o/p:

```
10
8
6
loop over
```

break statement
(e.g. division operation)

```
for i in range (1,10):
    a = int(input(“Num1”))
    b = int(input(“Num2”))
    if b == 0:
        print(“Div by zero! Aborting!”)
        break
    else:
        c = a // b
    print(“quotient = “, c)
```

WAP to implement “guess the number” game

- Randomly generate num between range (1, 20)
- The user is given 5 chances to guess

“guess the number” game

```
import random
num = random.randint(1,20)
ch = 0
while ch<5:
    guess = int(input("Guess number in range 1..20"))
    if guess == num :
      print("Congratulations!!! You win")
      break
    else :
      ch += 1
if ch == 5:
  print("Number is: ",num)
  print("You lose! better luck next time")
```

continue statement

```
for i in range (1,20) :
    if i%5 == 0:
        continue
    else :
        print(i)
```

O/p: print all numbers except 5, 10, 15

pass statement

- The **pass statement** is used as a placeholder for future code.
- When the **pass statement** is executed, nothing happens,
- but you avoid getting an error when empty code is not allowed.
- Empty code is not allowed in loops, function definitions, class definitions, or in if **statements**.

pass statement

```
x = 33
if x < 100:

print("outside if statement")
```

O/p: Error: expected an indented block

pass statement

```
x = 33
if x < 100:
        pass
print("outside if statement")
```

O/p: outside if statement

Comprehensions in Python

- It provide us with a short and concise way to construct new sequences

- Types of comprehensions:
  - List Comprehensions
  - Dictionary Comprehensions
  - Set Comprehensions

List Comprehensions

```
# Constructing list using for loop
L1 = []
for i in range(1, 10):
    L1.append(i ** 2)
```

```
# Constructing list using list comprehension
L1 = [i ** 2 for i in range(1,10)]
```

- **We may add conditions also**

```
L3 = [ i for i in range(1,20) if i%5 == 0 ]
```

Dictionary comprehension

```
# Constructing dictionary using for loop
D1 = {}
for i in range(1, 10):
      D1[i] = i ** 2
```

O/p:

```
{1: 1,   2: 4,   3: 9,   4: 16,  5: 25,  6: 36,  7: 49,  8: 64,  9: 81}
```

Dictionary comprehension

```
# Constructing dictionary using comprehension
D2 = {  i : i**2    for i in range(1,10) }
```

```
D3 = {  i : i     for i in range(1,20)   if i%5 == 0 }
```

O/p:

```
{5: 5, 10: 10, 15: 15}
```

Set comprehension

```
D3 = { i for i in range(1,20) if i%5 == 0}
```

O/P

```
{10,  5,  15}
```

Example1:

# Type casting of all list elements

```
L1=list(input("enter list").split(' '))

L1=[int(L1[i]) for i in range(len(L1))]

print(sum(L1))
```

Example2:

```
# Take input elements from user without creating empty Matrix

L1=[[int(input("Enter element")) for i in range(3)] for j in range(3)]
```

Example3:

```
#Matrix Addition
A = [[1,2,3], [4 ,5,6], [7 ,8,9]]

B = [[9,8,7], [6,5,4], [3,2,1]]
  C= [[A[i][j]+B[i][j] for j in range(0,len(A[0]))] for i in range(0,len(A))]

for i in range(len(A)):
    print(C[i])
```