GATE

CRASH COURSE

Data Science & AI

Subject

Python - For Data Science Control Strings and Lists

Lec No. 04

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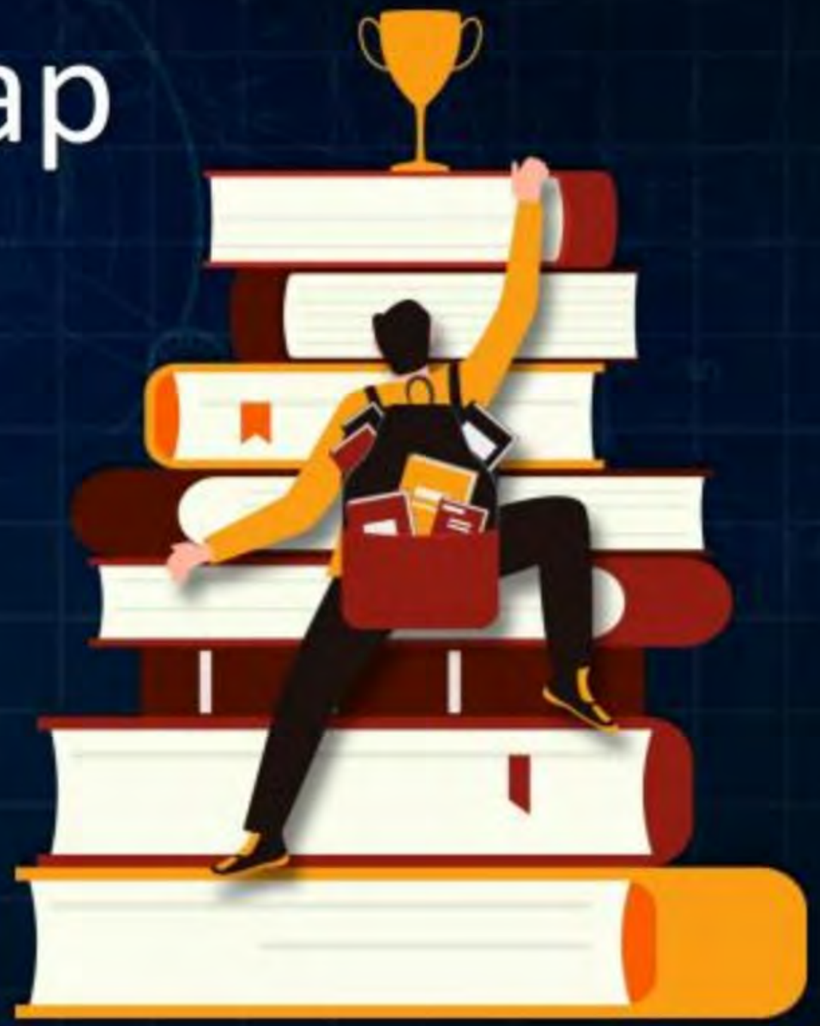
Last Class

Quick Recap

1. Homework Question Solution
2. Types Of Control Statements
3. Selection Statements



Topics to be covered

1. Homework Question Solution
2. Iterative Control Statements
3. Unconditional Statements
4. Strings and Lists
5. Examples

Homework Question

o/p : −4

```
count=1
i=0
while i<=10:
        match i:
                case 3: count=count+2
                case 1: count=count+4
                case 7: count*=2
                case 0: count-=2
                case 6: count//=2
                case 9: count+=3
                case _: count=count-1
        i=i+2
print(count)
```

i=0 Count = 1 − 2 = −1

i=2 Count = −2

i=4 Count = −3

i=6 Count = −3 // 2 = −1.5 ⇒ −2

1.5
2 | 3

i=8 Count = −2 − 1 = −3

i=10 Count = −3 − 1 = −4

Iterative Control Statements

Iteration = Repetition == Loop

- while loop , while-else
- for loop , for-else

Syntax:

```
while expression :
    statement(s)
```

- Until Expression becomes false, Statement(s) will get executed.
- Advised is to avoid Infinite Execution

o/p: 9

Ex:1

```
i=1
while i<5:
    Print('Hi')
```

o/p: Hi
Hi
Hi
:
:
Infinite times

Ex:2

```
Count = 0
i = 1
while i<=5 :
    Count = Count + i
    i = i+2
Print(Count)
```

Sol:

i=1 <=5 True Count=0+1 =1

i=3 <=5 True Count=1+3 =4

i=5 <=5 True Count = 4+5 = 9

i=7, 7<=5 False

Print(Count) ⇒ 9

i=3 result = 10+3=13

1>3 False

i=5 5<5 False

Ex:3

result = ~~1 7 7~~ 10 13

i=1

j=~~5 3~~ 1

```
while i<5 :
    result = result + i
    while j>i :
        result = result + j
        j = j-2
    i = i+2
Print(result)
```

#13

i=1 result = 1+1 = 2

5>1 True result = 2+5=7

3>1 True result = 7+3=10

1>1 False

Iterative Control Statements

for loop

Syntax: for object in Iterable/range(start, stop, step):
    Statement(s)

default=0 (start), default=1 (step)

start: optional
stop: mandatory — Value is Excluded for Iteration
step: optional

Ex:1

```
for i in range(5):
    print(i, end=' ')
```

o/p: 0 1 2 3 4

Ex:2

```
for i in range(2, 10, 3):
    print(i, end=' ')
```

o/p: 2 5 8

i=1	i=3	i=5	i=7	i=9
=2x1+1 =3	2x3+3 =9	2x9+5 =23	2x23+7 =53	2x53+9 =115

Ex:3

```
for i in range(10, 1, -2):
    print(i, end=' ')
```

o/p: 10 8 6 4 2

Ex:4

```
count = 1
for i in range(count, 10, 2):
    count += count + i
print(count)
```

(count considered at beginning)

count = count + count + i = 2 * count + i

o/p: 115

Question

```
ans = 1
i = 38
for j in range(3, 7):
    ans = ans + i + j
    while i < ans:
        j = j + 1
        i = i + j
Print(ans)
```

o/p: 82

j=3	ans= 1+2+3=6	2<6 True	j=3+1=4, i=2+4=6
		6<6 False.	
j=4	ans= 6+6+4 = 16	6<16 True	j=5, i=6+5=11
		11<16 True	j=6, i=11+6=17
		17<16 False	
j=5	ans= 16+17+5 = 38	17<38 True	j=6, i=17+6=23
		23<38 True	j=7, i=23+7=30
		30<38 True	j=8, i=30+8=38
		38<38 False	
j=6	ans= 38+38+6 = 82	38<82 True	j=7, i=38+7=45
			j=8, i=45+8=53
			j=9, i=53+9=62
			j=10, i=62+10=72
			j=11, i=72+11=83
		83<82 False	

Question

```
result = 1

for i in range(2, 7, 3):
    for j in range(i):
        result = result + i + j

Print(result)
```

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$i=2$	$j=0$	$j=1$
for j in range(2)	result = 1+2+0	result = 3+2+1
⇒ 0, 1	= 3	= 6

$i=5$	$j=0$	$j=1$	$j=2$	$j=3$
for j in range(5)	= 6+5+0	= 11+5+1	17+5+2	24+5+3
⇒ 0, 1, 2, 3, 4	= 11	= 17	= 24	= 32

$j=4$

$= 32+5+4 = 41$

Jumping Control Statements

break, continue, Pass, return

break : Causes Control to move out of the current loop

Continue : Causes Control to move to beginning of Next iteration of respective loop

Pass : A Place holder Statement

Ex:

```
for i in range(7)
    if i==3:
        break
        Print(i)
```

o/p: 0 1 2

```
for i in range(7):
    if i==3:
        continue
    Print(i)
```

o/p: 0 1 2 4 5 6

Question

Home-work-1

```
for i in range(1, 7, 2):
    for j in range(i):
        Print(i+j)
        if j%2==1:
            break
```

The Number of times Print Statement Executed is _____

Home-work-2

```
for i in range(1, 7, 2):
    for j in range(i):
        Print(i+j)
        if j%2==1:
            continue
```

The Number of times Print Statement Executed is _____

Strings and Lists in Python

- String: A class of zero or one or multiple characters.

- object = ( ) (or) object = " " (or) object = """ """ (or) obj = str( )

Ex: x = 'GATE' (or) x = "GATE" (or) x = """GATE EXAM 2025""" (or) x = str("GATE")

Ex:
```
st = "GATE EXAM"
for i in st:
    print(i, end=',')
```
o/p: G, A, T, E, , E, X, A, M,

Ex:
```
st = "GATE EXAM"   #len(st) = 9
for i in range(len(st)):
    print(st[i], end=',')
```
o/p: G, A, T, E, , E, X, A, M

0	1	2	3	4	5	6	7	8	Index
G	A	T	E		E	X	A	M	

Strings and Lists in Python

Lists: A mutable, ordered collection

- It supports duplicates.
- object = [values] (or) object = [ ] (or) object = list( )

Ex: lis = [10, 'GATE', 3.47, 12+6j, 'x', 15, True, None]

	0	1	2	3	4	5	6	7
lis	10	GATE	3.47	12+6j	x	15	True	None

Strings and Lists in Python

- Strings, Lists, Tuples Supports both +ve and -ve Indexing
- Positive Indexing Starts with 0 by default, from start to End.
- Negative Indexing Starts with -1 by default, from End to start.

Ex: s = 'GATE EXAM'

+ve Index	0	1	2	3	4	5	6	7	8
	G	A	T	E		E	x	A	M
-ve Index	-9	-8	-7	-6	-5	-4	-3	-2	-1

l = [10, 20, 50, -34, -23, 27, 10]

+ve	0	1	2	3	4	5	6
l	10	20	50	-34	-23	27	10
-ve Index	-7	-6	-5	-4	-3	-2	-1

Question

Slicing ⇒ ':' operator is called Slice operator.

⇒ Actually it is a seperator.

Start : Stop : Step

	0	1	2	3	4	5	6	7	8
i	G	A	T	E		E	x	A	M
	-9	-8	-7	-6	-5	-4	-3	-2	-1

Ex:

```
i = 'GATE EXAM'
print(i[1:5])      # ATE_
print(i[2:])       # TE EXAM
print(i[:6])       # GATE E
print(i[1:7:2])    # AEE
print(i[-1:-5])    # No o/p
print(i[-1:])      # M
print(i[:-5])      # GATE
```

Summary

- Iterative Stmts
- Unconditional Stmts
- Strings, lists
  - Indexing
  - Slicing

To be contd...

Keep Hustling!