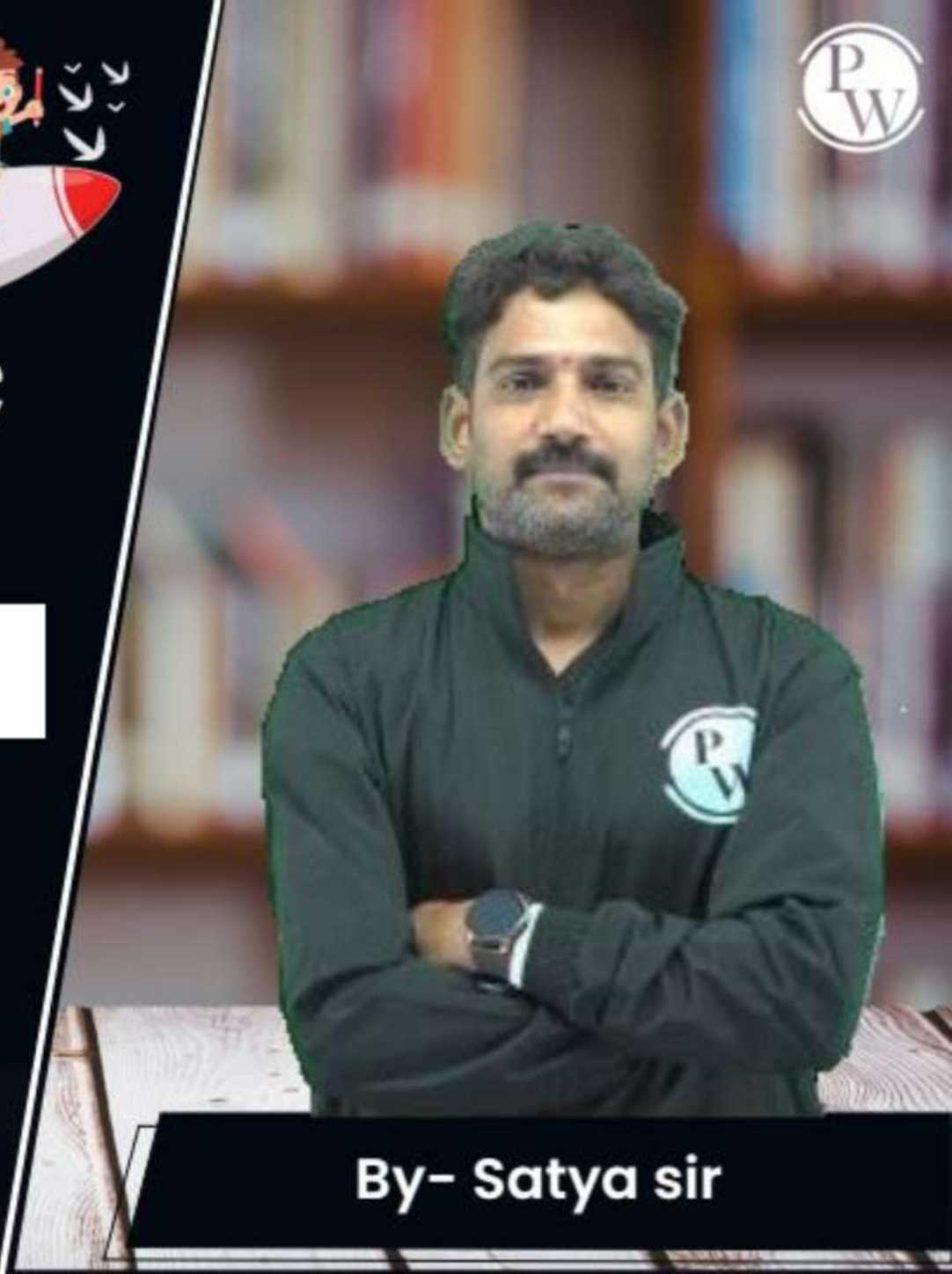
Data Science & Artificial Intelligence

Python For Data Science



Lecture No.- 03

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Recap of Previous Lecture

Conditional Control Statements

- if
- Nested if
- if-else
- if-elif-else
- match-case

Topics to be Covered

- Looping Control Statements
  - while
  - for
- Jumping statements
  - break
  - Continue
  - Pass

SUPER 1500+ - CLASS – 2 - Homework Question - 1

#Q. The final count value is 5

```
i=1
count=2
while i<=5:
    while count<5:
        count=count+i
    i=i+2
```

Count

i=1 1<=5 — 2<5 True — Count = 2+1=3 — 3<5 True — Count = 3+1=4 — 4<5 True — Count = 5 — 5<5 False

i=3 3<=5 — 5<5 False

i=5 5<=5 — 5<5 False

i=7 7<=5 False

SUPER 1500+ - CLASS – 2 - Homework Question - 2

#Q. The final value of count will be -2

```
i=1
count=0
while i<4:
   match i:
      case 1:
         count+=2
         count<<=i
      case 3:
         count-=i
      case _:
         count>>=i
   i=i+1
print(count)
```

i = 1

Count = 2

Count = 2<<1

= 2 * 2^1

= 4

i = 2

Count = Count >> 2

= 4 >> 2

= 4 // 2^2

= 4 // 4

= 1

i = 3

Count = Count - i

= 1 - 3

= -2

SUPER 1500+ - CLASS – 2 - Homework Question - 3

#Q. How Many Times print statement executes in the below Code?

```
i=1 2
j=5
while i is not j:
    i=i+1
    while j is not i:
        j=j-1
        print(" ")
```

1 is not 5 True

5 is not 2, 4 is not 2, 3 != 2, 2 != 2 false

j=4 (1st) j=3 (2nd) j=2 (3rd)

2 is not 2 False

ANS: 3

SUPER 1500+ - CLASS – 2 - Homework Question - 4

#Q. The final value of count will be 36

```
i=1
j=5
count=1
while i<j:
    count=count+j
    while j<10:
        count=count-i
        j+=2
    i+=3
print(count)
```

1 < 5

Count = 1+5 = 6

5<10 T

Count = 6-1 = 5

7<10 T

count = 5-1 = 4

9<10 T

Count = 4-1 = 3

j = 11

4 < 11

Count = 3+11 = 14

7 < 11

Count = 14+11 = 25

10 < 11

Count = 25+11 = 36

13 < 11

False

SUPER 1500+ - CLASS – 2 - Homework Question - 5

#Q. The output printed by below code is _____

```
a=1
count=1
while a<5:
    while count<10:
        count<<=a
    a=a+1
print(count)
```

a=1

1<10 True

Count = 1 << 1
= 1 * 2^1
= 2

2<10 True

Count = 2 << 1
= 2 * 2 = 4

4<10

Count = 4 * 2 = 8

8<10

Count = 8 * 2 = 16

a=2

16<10 False

a=3

16<10 F

a=4

16<10 false

#Q. The Output printed will be ____

```
i=1
while i<=3:
        i=1
        print(i+1)
        i=i+1
```

i=1 | 1<=3 True, i=1, Print 2, i=2 | 2<=3 True, i=1, Print 2, i=2 | 2<=3 True, i=1, Print 2, i=2 | ---- Infinite times

A) 2 2 2

B) 2 3 4

C) 2 3

D) Infinite Execution

#Q. The Output printed will be ____

```
i=1
for i in range(3):
    i=1
    print(i+1)
    i=i+1
```

$i_1 = 1$

$i_2 = 0$,	$i_2 = 1$	$i_2 = 2$	$i_2 = 3$, $3 < 3$ False
$i_3 = 1$	$i_3 = 1$	$i_3 = 1$	
Print 2	Print 2	Print 2	
$i_3 = 2$	$i_3 = 2$	$i_3 = 2$	

A) 2 2 2

B) 2 3 4

C) 2 3

D) Infinite Execution

#Q. The Output printed will be 7

```
a=1
b=0
count=1
while a<=4:
   while b<=a:
      count=count+b
      b=b+2
   a=a+1
print(count)
```

a=1

b= 0<=1 True

Count = 1+0 = 1

b=2

a=2

2<=4 True

b<=a

2<=2 True

Count = 1+2 = 3

b=4

a=3

4<=3 False

a=4

4<=4 True

Count = 3+4 = 7

b=6

Count = 7

A) 1
B) 3
C) 7
D) 11

#Q. Result Value at the end of execution will be 68

```
count=1
for i in range(5):
    match i:
        case 1:
            count+=4
        case 3:
            count*=3
        case 5:
            count//=2
        case _:
            count-=1
result=count-i
for i in range(count):
    result=result+count
```

i=0 Count = 1-1=0 result = 0-0=0

i=1 Count: 0+4=4 result = 4-1=3

i=2 Count = 4-1=3 result = 3-2=1

i=3 Count = 3*3=9 result = 9-3=6

i=4 Count = 9-1=8 result = 8-4=4

result=4

i in range(8)

result = 4+8+8+8+8+8+8+8+8

=68

#Q. The final value of result will be 32

$A >> n \equiv A // 2^n$

$A << n = A * 2^n$

```
result=1
x=2**10
y=1
while x>1:
    y=y*2
    x=x>>3
while y>=1:
    result=result+y
    y=y//2
print(result)
```

$x = 2^{10} = 1024$

$x = 1024$	$x = 128$	$x = 16$	$x = 2$	$x = 0$
$y = 1 * 2 = 2$	$y = 2 * 2 = 4$	$y = 4 * 2 = 8$	$y = 8 * 2 = 16$	$0 > 1$ False
$x = 1024 >> 3$	$x = 2^7 // 2^3$	$x = 2^4 // 2^3$	$x = 2^1 // 2^3$	
$= 1024 // 2^3$	$= 2^4 = 16$	$= 2$	$= 0$	
$= 1024 // 8$				
$= 2^7 = 128$				

$y = 16 >= 1$	$8 >= 1$	$4 >= 1$	$2 >= 1$	$1 >= 1$	$0 >= 1$ False
result = 1 + 16	result = 17 + 8	result = 25 + 4	result = 29 + 2	result = 31 + 1	
= 17	= 25	= 29	= 31	= 32	
$y = 16 // 2$	$y = 8 // 2$	$y = 4 // 2$	$y = 2 // 2$	$y = 1 // 2$	
$= 8$	$= 4$	$= 2$	$= 1$	$= 0$	

#Q. The Output will be 51

```
count=1
for i in range(10,1,-2):
    i=i-3
    for j in range(i):
        count=count+i-j
print(count)
```

start stop step

51

C: for(i=10; i>1; i=i-2)

Python: for i in range(10,1,-2)

i = 10

i = 7	j=0	j=1	j=2	j=3	j=4	j=5	j=6
	Count = 1+7-0 = 8	Count = 8+7-1 = 14	14+7-2 = 19	19+7-3 = 23	23+7-4 = 26	26+7-5 = 28	28+7-6 = 29

i = 8

i = 5	j=0	j=1	j=2	j=3	j=4
	Count = 29+5-0 = 34	Count = 34+5-1 = 38	Count = 38+5-2 = 41	Count = 41+5-3 = 43	Count = 43+5-4 = 44

i = 6

i = 3	j=0	j=1	j=2
	Count = 44+3-0 = 47	47+3-1 = 49	49+3-2 = 50

i = 4

i = 1	j=0
	Count = 50+1-0 = 51

i = 2

i = -1 j in range(-1) ⇒ Not Executed.

#Q. The running time complexity of below code segment is _____

```
for i in range(n):
    for j in range(i):
        k=1
        while k<=n:
            print(" ")
            k=k*2
```

2^0 2^1 2^2 2^3 ..... $2^x <= n$

K=1 K=2 K=4, 8 .....

1<=n 2<=n 4<=n 8<=n

for i in range(n): ⟹ n times

for j in range(i): ⟹ n times

while k<=n: $\log_2^n$ times

$= n * n * \log_2^n$ times

$= O(n^2 * \log_2^n)$

$2^x <= n$

$x <= \log_2^n$

$x = \lceil \log_2^n \rceil$

A) $O(n^3)$

B) $O(n^2 * \log n)$

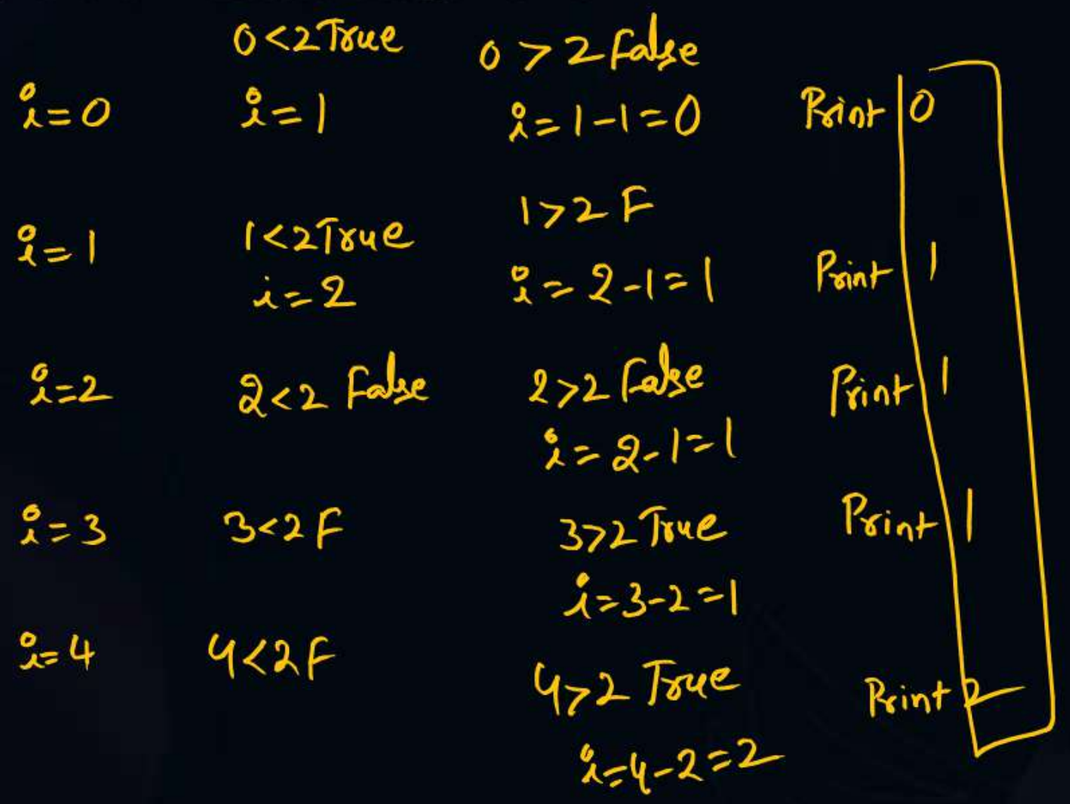
C) $O(n \log^2 n)$

D) $O(n^2 * 2^n)$

#Q. What gets printed by below code segment?

```
n = 5
for i in range(n):
    if i < 2:
        i+=1
    if i > 2:
        i-=2
    else:
        i-=1
    print(i)
```

A) 1 2 1 1 2
B) 2 3 2 2 3
C) 0 1 1 1 2
D) 1 2 1 1 3



#Q. What gets printed by below code segment?

```
for i in range(0,9,2):
    print(i^1,end=' ')
```

A) 0 2 4 6 8

B) 1 3 5 7 9

C) 1 0 1 0 1

D) 0 1 0 1 0

i=0 $0 \wedge 1 = 1$

i=2 $2 \wedge 1 \Rightarrow 2 = 10,\ 1 = 01,\ 11 = 3$

i=4 $4 \wedge 1 \Rightarrow 4 = 100,\ 1 = 001,\ 101 = 5$

i=6 $6 \wedge 1 \Rightarrow 7$

i=8 $8 \wedge 1 = 9$

SUPER 1500+ - CLASS – 3 - Homework Question - 1

#Q. Count Value at the end of execution will be _____

```
count=1
for i in range(5):
    for j in range(4):
        if i<j:
            count=j-count
        elif i>j:
            count=i-count
        else:
            break
print(count)
```

SUPER 1500+ - CLASS – 3 - Homework Question - 2

#Q. What does the following Python code segment print?

```
result=4
for i in range(3):
    i*=2
    for j in range(i):
        j+=2
        result=result+i+j
print(result)
```

SUPER 1500+ - CLASS – 3 - Homework Question - 3

#Q. The final value of count will be _____

```
a,b,c=1,2,0
count=1
for i in range(c,b,a):
    b=b+1
    for j in range(b):
        count+=i+j
```

SUPER 1500+ - CLASS – 3 - Homework Question - 4

#Q. Count Value at the end of execution will be _____

```
count=1
for i in range(5):
   match i:
      case 1:
         count+=1
         for i in range(count):
            count+=1
      case 2:
         count*=2
         for i in range(count):
            count+=1
      case 4:
         count//=2
         for i in range(count):
            count+=1
      case _:
         count-=1
         for i in range(count):
            count+=1
```

SUPER 1500+ - CLASS – 3 - Homework Question - 5

#Q. The Total number of times print statement executed is _____

```
i=len("GATE")
j=len("EXAMINATION")
while j!=i:
    print(i+j)
    j=j-1
else:
    print(i+j)
```

2 mins Summary

- Iterative Control statements

Next Topic : Strings, Lists, Tuples*

THANK - YOU