

PYTHON SIMPLE PROGRAMS – PART 3

While Loop • Quick Notes

About This Note

This collection focuses on Python programs written using the while loop. The examples emphasize initialization, condition, processing, updating the loop variable, and termination.

Programs Included

No.	Program
1	Compute Factorial of N
2	Sum of First Five Natural Numbers
3	Sum of Integers from 1 to 100
4	Sum of Even Numbers up to N
5	Sum of Squares of First N Natural Numbers

1. Compute Factorial of N

Python Code

```
# Program to compute factorial of N
n = int(input("Enter value of N: "))

factorial = 1
i = 1

while i <= n:
    factorial = factorial * i
    i = i + 1

print("Factorial of N is:", factorial)
```

► Sample Output

```
Enter value of N: 5
Factorial of N is: 120
```

Key Idea

A while loop repeatedly multiplies the numbers from 1 to N. The variable i must be updated explicitly.

2. Sum of First Five Natural Numbers

Python Code

```
# Program to find the sum of first five natural numbers
sum = 0
count = 1

while count <= 5:
    sum = sum + count
    count = count + 1

print("Sum of 1st 5 numbers is:", sum)
```

► Sample Output

```
Sum of 1st 5 numbers is: 15
```



Key Idea

sum is an accumulator. count starts at 1 and is increased by 1 after every iteration.

3. Sum of Integers from 1 to 100



Python Code

```
# Program to calculate the sum of integers from 1 to 100
sum = 0
i = 1

while i <= 100:
    sum = sum + i
    i = i + 1

print("Sum of integers from 1 to 100 is:", sum)
```

► Sample Output

```
Sum of integers from 1 to 100 is: 5050
```



Key Idea

The loop adds each integer from 1 through 100. Initialization, condition, and update control the repetition.

4. Sum of Even Numbers up to N



Python Code

```
# Program to find the sum of all even numbers up to N
n = int(input("Enter value of n: "))

sum = 0
i = 0

while i <= n:
    sum = sum + i
    i = i + 2

print("Sum of even numbers up to n is:", sum)
```

► Sample Output

```
Enter value of n: 10
Sum of even numbers up to n is: 30
```



Key Idea

Starting at 0 and increasing i by 2 generates only even numbers: 0, 2, 4, 6, 8, 10.

5. Sum of Squares of First N Natural Numbers



Python Code

```
# Program to find the sum of squares of first N natural numbers
n = int(input("Enter value of n: "))

sum = 0
i = 1

while i <= n:
    sum = sum + i * i
    i = i + 1

print("Sum of squares of integers up to n is:", sum)
```

► Sample Output

```
Enter value of n: 5
Sum of squares of integers up to n is: 55
```



Key Idea

$i * i$ calculates the square of the current natural number, and the result is added to the accumulator sum.



Quick Revision: while Loop

Remember the four steps

1. Initialize the control variable
2. Check the condition
3. Execute the loop body
4. Update the control variable



Important

A while loop must eventually reach a condition that becomes False. If the control variable is not updated correctly, the loop may run indefinitely.



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Guido van Rossum
Creator of Python

Stefan M. Lutz
Co-creator of Python

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