

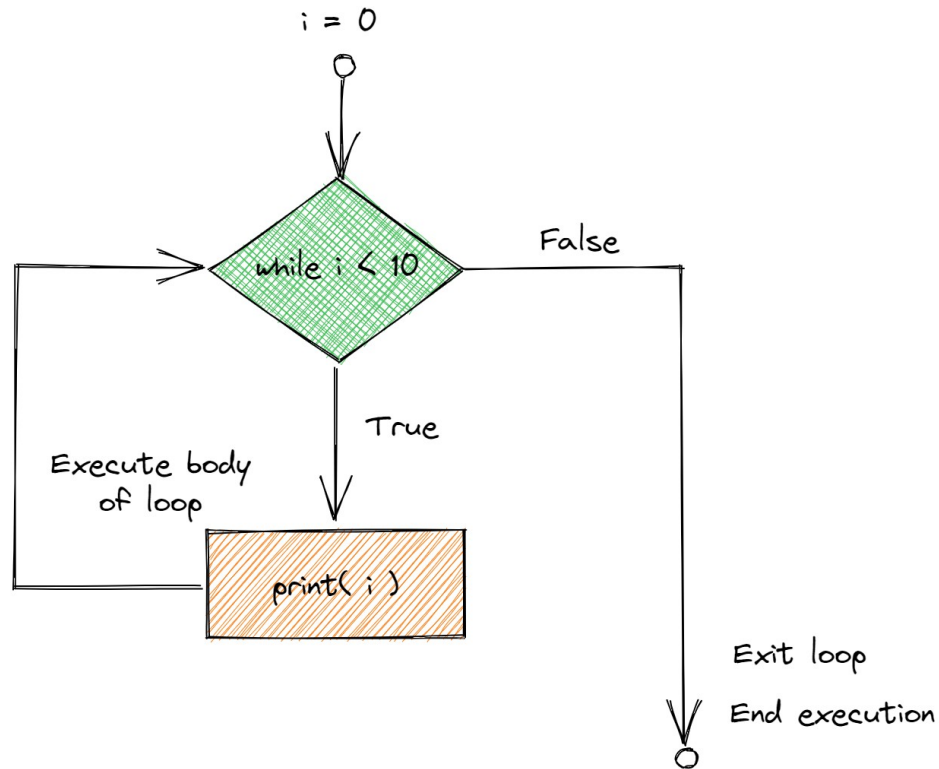
Learn to program, for OUSL BSE 2025/26

Session 6, 26 March 2026 (pre-recorded)
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Topics today

- **Recap 4.1 Print 1..N | 4.2 Sum of 1..N**
- **Discussion 4.3 Average of a given number of data points**
- **Discussion 4.4 Average of a sequence of data points**
- **Pre-session 4.7 Draw a flag**
- **Main: 4.8 Draw a Christmas tree**
- **What next**

“while” the central mechanism for iteration



4.1 Print 1..N, 4.2 Sum of 1..N (while)

Print 1 2 3..N for a given N.

Input:

Type N: 4

Output:

```
1      6
2      7 print("Type n: ")
3      8 n = int(input())
4      9
      10 i = 1
      11 while (i <= n):
      12     print(i)
      13     i = i + 1
      14
```

Find the sum $1 + 2 + 3 + \dots + N$ for a given N .

Input:

Type N: 4

Output:

```
6
7 print("Type N: ")
8 n = int(input())
9
10 sum = 0
11 i = 1
12 while (i <= n):
13     sum = sum + i
14     print(sum)
15     i = i + 1
16
```

4.3 Average of a given no. of data points

Find the average of marks. The program first asks the number of data points, then read them and finally print their average.

Input

How many data points? 5

Enter the marks one-by-one, with Enter in between:

45.6

67.0

85.6

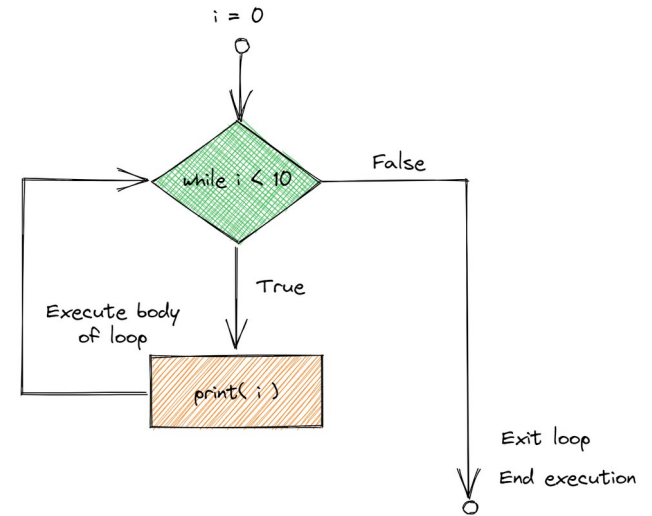
38.0

88.0

The average is: 64.84

```
6
7 print("Type n: ")
8 n = int(input())
9
10 i = 1
11 while (i <= n):
12     print(i)
13     i = i + 1
14
```

Solution 4.1:



4.4 Average of a sequence

Write a program to calculate the average of your exam marks. You don't want to type the number of subjects at the beginning. Instead you signal the end of the sequence with a 0 marks.

Input

Enter the marks one-by-one, with Enter in between:

45.6

67.0

85.6

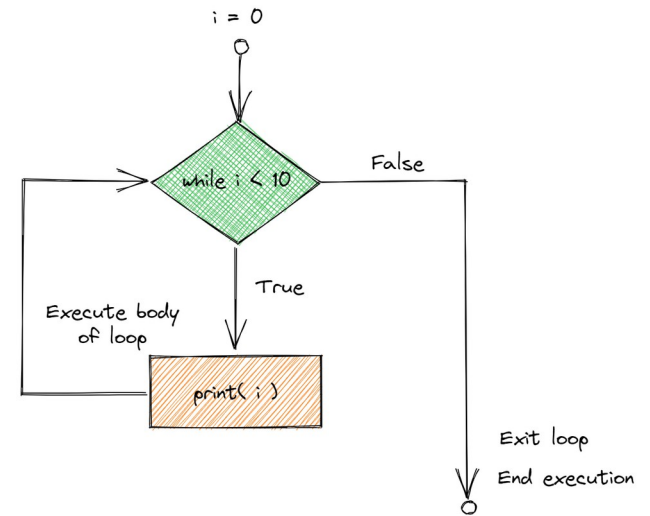
38.0

88.0

0

The average is: 64.84

while mark > 0:
 sum it!
 increment the count
 input next



4.7 Draw a flag (while in a while)

Given the height in `lines`, draw the following "flag" (sample shows `lines = 5`):

Input :

What is the height (in lines)? `5`

Output :

```
*  
**  
***  
****  
*****
```

```
while counter1 1..N:  
  while counter2 ?..?:  
    print("*")
```

4.8 Draw a Christmas tree

Given the number of lines, draw the "Christmas tree" (sample shows lines = 5):

```
  *
 * * *
* * * * *
* * * * * *
* * * * * * * *
```

```
while counter1 1..N:
  while counter2 ?..?:
    Print("_")
  while counter3 ?..?:
    Print("*")
```

What next

- From Iteration (Unit 4) to Subprograms (Unit 5, final unit)
 - Pre-session: Calendar functions
 - Pre-session: Safe Exam Browser
 - Session: Menu-driven programs (Units 4 and 5)
- Session: Trial exam



End