
For loop, while loop

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Python loop

Python has 2 loop command

- While loop
- For loop

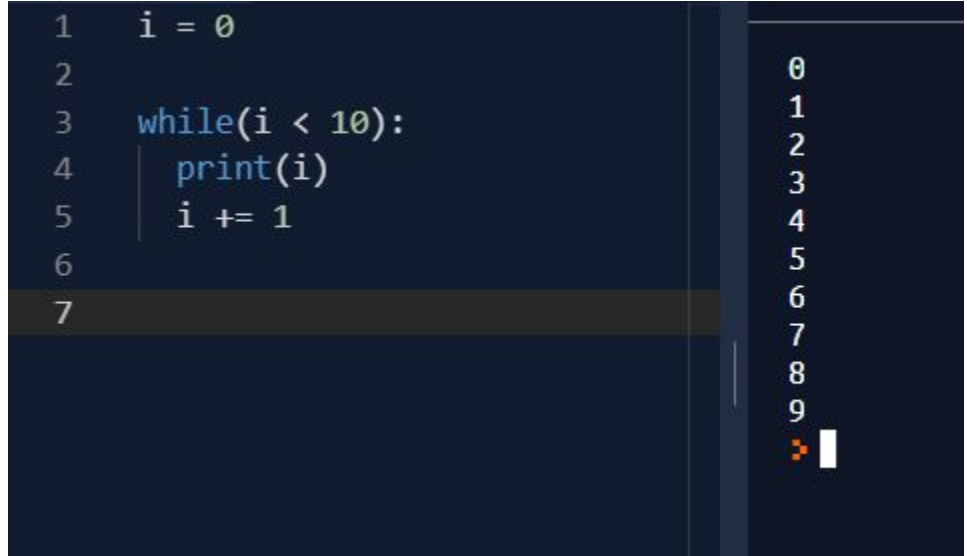
While loop

While condition:

Do_commands

Do the commands until
the condition False

```
1  i = 0
2
3  while(i < 10):
4      print(i)
5      i += 1
6
7
```

A screenshot of a Python interpreter window with a dark background. The left pane shows a code editor with a while loop that initializes i to 0 and prints i while i is less than 10, incrementing i by 1 each time. The right pane shows the output of the program, which is the numbers 0 through 9 printed on separate lines. A cursor is visible at the end of the last line of output.

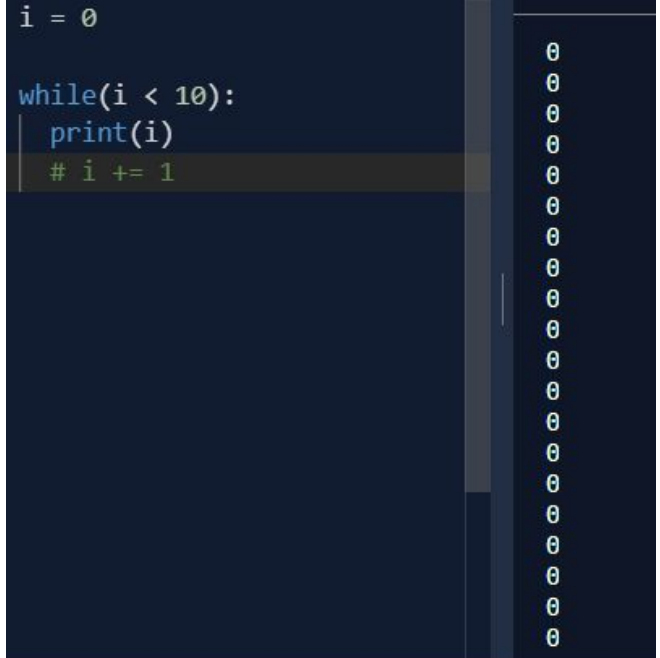
0
1
2
3
4
5
6
7
8
9

Infinite loop

The loop runs infinitely => the program doesn't stop at all => avoid it

Need to change the condition inside the while

```
i = 0  
  
while(i < 10):  
    print(i)  
    # i += 1
```



Exercise

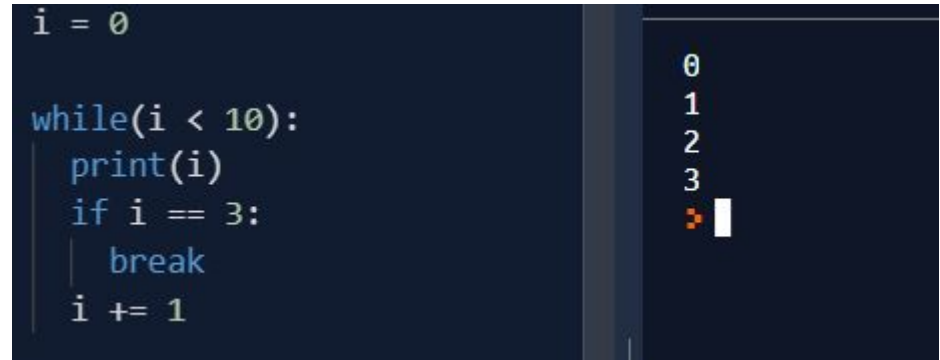
1. In ra các số chẵn nhỏ hơn 10
2. Cho người dùng nhập điểm cho đến khi điểm trong khoảng 0 - 10, nếu người dùng nhập sai in thông báo điểm không hợp lệ và cho người dùng nhập lại. Cuối cùng in ra điểm nhập đúng.

Break

Break command exit the loop immediately

```
i = 0

while(i < 10):
    print(i)
    if i == 3:
        break
    i += 1
```



Continue

Continue command skips the current loop and continue the next loop.

```
i = 0

while(i < 10):
    i += 1
    if i == 3:
        continue
    print(i)
```

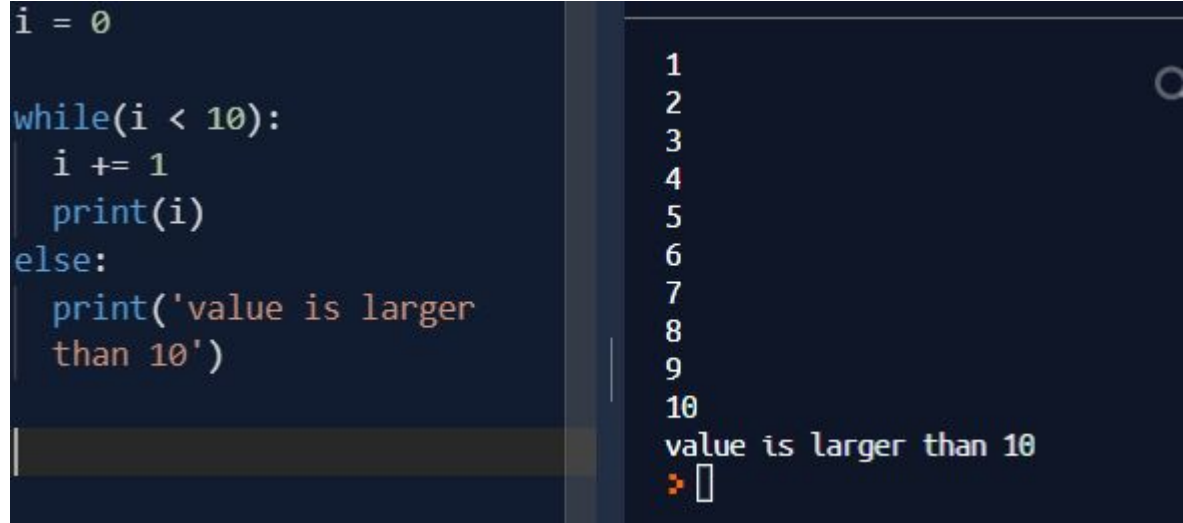
1
2
4
5
6
7
8
9
10

Else

While condition:
 commands

Else:
 commands

```
i = 0
while(i < 10):
    i += 1
    print(i)
else:
    print('value is larger
    than 10')
```



```
1
2
3
4
5
6
7
8
9
10
value is larger than 10
```


For loop

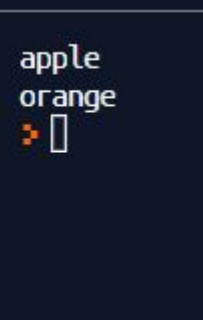
For is used to iterate the collection (dict, set, list, tuple,..)

```
fruits = ['apple', 'orange',  
          'banana']  
  
for f in fruits:  
    print(f)
```

```
apple  
orange  
banana  
❏
```

Break


```
fruits = ['apple', 'orange',  
         'banana']  
  
for f in fruits:  
    print(f)  
    if f == 'orange':  
        break
```



The terminal output on the right shows the execution of the code. It displays 'apple' on the first line, 'orange' on the second line, and an empty list representation '[]' on the third line, indicating that the loop has terminated after printing 'orange'.

Continue

```
fruits = ['apple', 'orange',  
          'banana']  
  
for f in fruits:  
    if f == 'orange':  
        continue  
    print(f)
```



range()

Range returns a sequence of number to iterate through it
range(start = 0, **stop**, step = 1): must provide stop, start and step are optional with default value 0, 1 respectively.

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

```
0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
▶
```

Exercise

1. Dùng for in ra các số nguyên dương chia hết cho 3 nhưng không chia hết cho 5 nhỏ hơn 100

Nested loop

Index of matrix

Sort array

```
for i in range(3):  
    for j in range(4):  
        print(i, j)
```

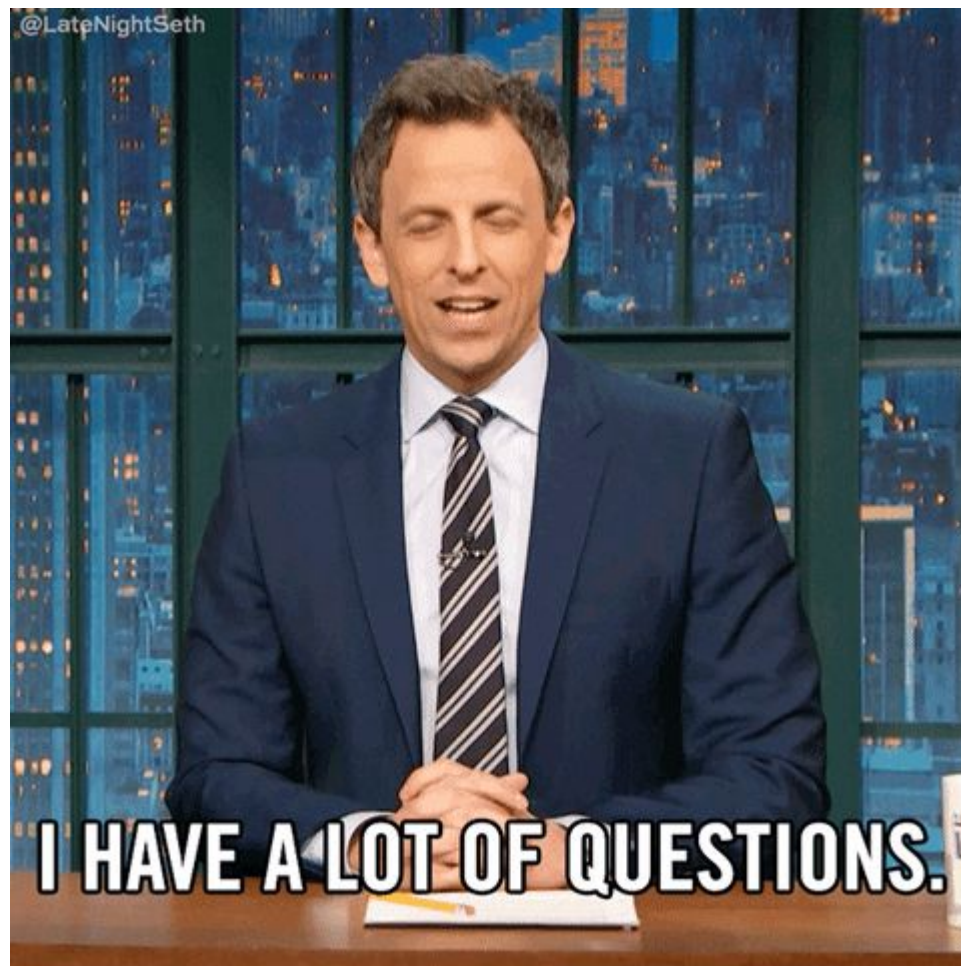
```
0 0  
0 1  
0 2  
0 3  
1 0  
1 1  
1 2  
1 3  
2 0  
2 1  
2 2  
2 3
```

Exercise

Cho ma trận kích thước 2×3 , $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$, tính:

- Tổng các phần tử trong ma trận.
- Tổng từng hàng của ma trận.
- Tổng từng cột của ma trận.

Q&A



The end

