What are control flow statements in Python?

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A program's `control flow` is the order in which the program's code executes.

The control flow of a Python program is regulated by conditional statements, loops, and function calls.

Python has *three* types of control structures:

- **Sequential** - default mode
- **Selection** - used for decisions and branching
- **Repetition** - used for looping, i.e., repeating a piece of code multiple times.

1. Sequential

Sequential statements are a set of statements whose execution process happens in a sequence. The problem with sequential statements is that if the logic has broken in any one of the lines, then the complete source code execution will break.

```
## This is a Sequential statement

a=20
b=10
c=a-b
print("Subtraction is : ",c)
```

2. Selection/Decision control statements

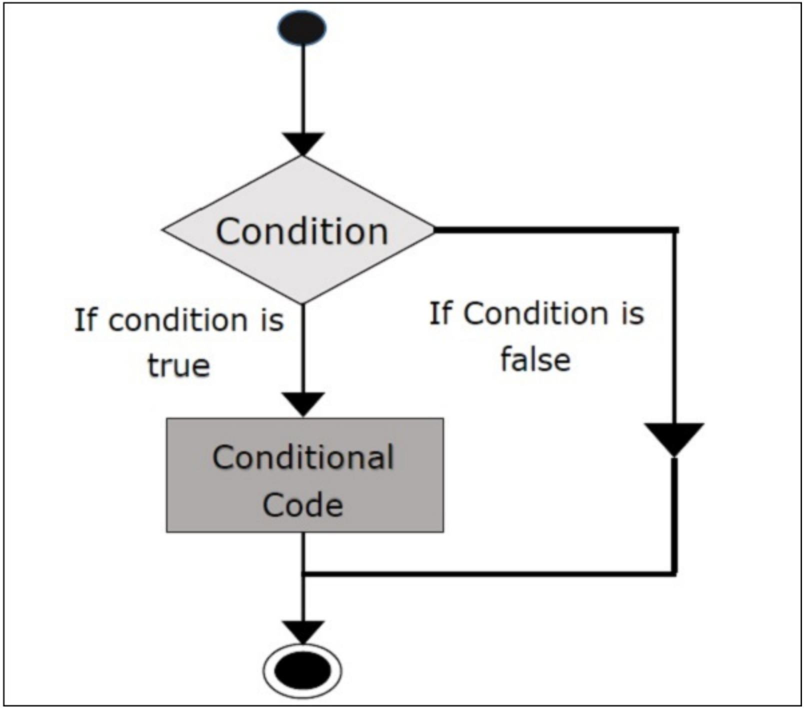
In Python, the selection statements are also known as *Decision control statements* or *branching statements*.

The selection statement allows a program to test several conditions and execute instructions based on which condition is true.

Some Decision Control Statements are:

- Simple if
- if-else
- nested if
- if-elif-else

Simple if: *If statements* are control flow statements that help us to run a particular code, but only when a certain condition is met or satisfied. A *simple if* only has one condition to check.



```
n = 10
if n % 2 == 0:
    print("n is an even number")
```

if-else: The *if-else statement* evaluates the condition and will execute the body of `if` if the test condition is True, but if the condition is False, then the body of `else` is executed.

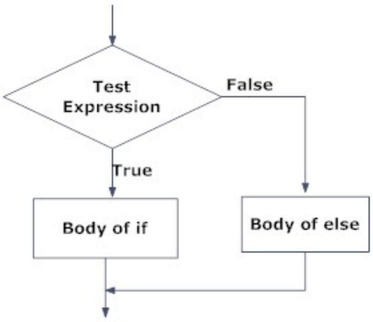
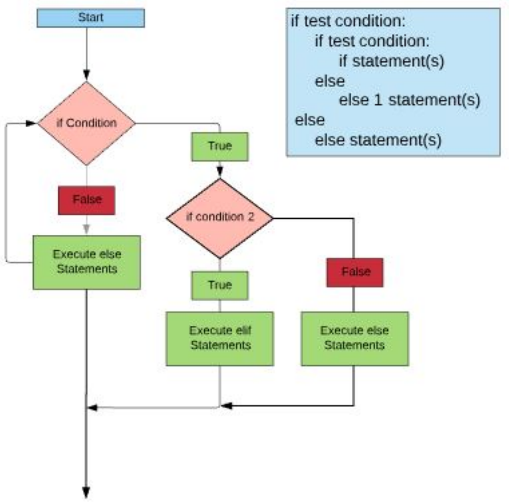


Fig: Operation of if...else statement

```
n = 5
if n % 2 == 0:
    print("n is even")
else:
    print("n is odd")
```

nested if: *Nested if statements* are an if statement inside another if statement.



```
if test condition:
    if test condition:
        if statement(s)
    else
        else 1 statement(s)
else
    else statement(s)
```

```
a = 5
b = 10
c = 15
if a > b:
   if a > c:
      print("a value is big")
   else:
       print("c value is big")
elif b > c:
    print("b value is big")
else:
     print("c is big")
```

if-elif-else: The *if-elif-else statement* is used to conditionally execute a statement or a block of statements.

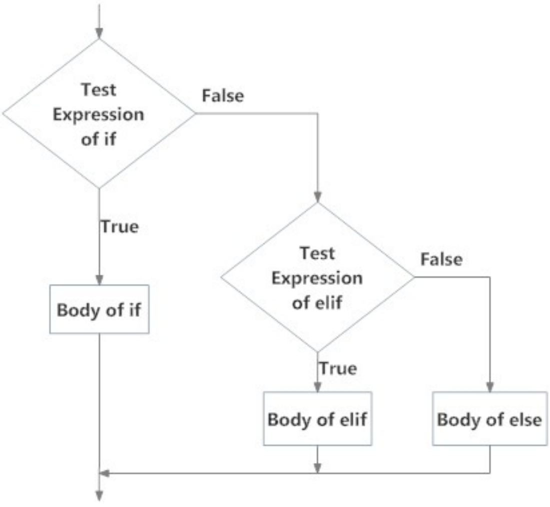


Fig: Operation of if...elif...else statement

```
x = 15
y = 12
if x == y:
   print("Both are Equal")
elif x > y:
    print("x is greater than y")
else:
    print("x is smaller than y")
```

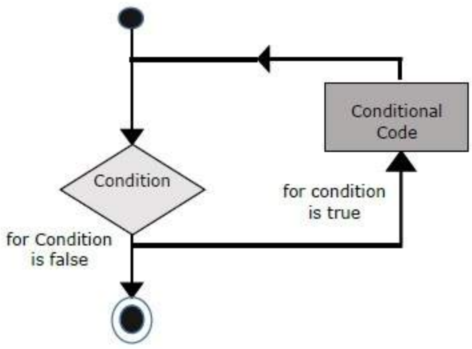
3. Repetition

A **repetition statement** is used to repeat a group(block) of programming instructions.

In Python, we generally have two loops/repetitive statements:

- for loop
- while loop

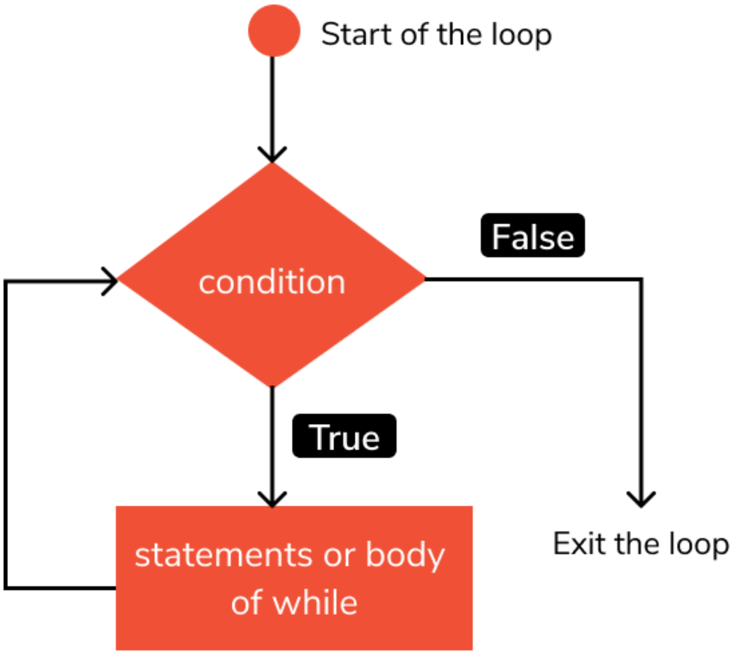
for loop: A *for loop* is used to iterate over a sequence that is either a list, tuple, dictionary, or a set. We can execute a set of statements once for each item in a list, tuple, or dictionary.



```python
lst = [1, 2, 3, 4, 5]
for i in range(len(lst)):
     print(lst[i], end = " ")

for j in range(0,10):
    print(j, end = " ")
```

while loop: In Python, *while loops* are used to execute a block of statements repeatedly until a given condition is satisfied. Then, the expression is checked again and, if it is still true, the body is executed again. This continues until the expression becomes false.



CONTRIBUTOR

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```python
m = 5
i = 0
while i < m:
     print(i, end = " ")
     i = i + 1
print("End")
```

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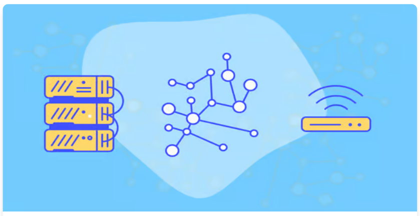

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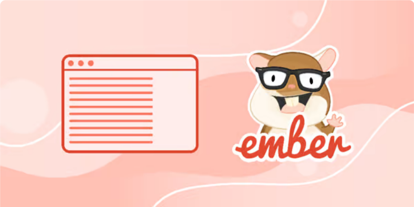

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