

Operator Precedence

Descending Order of Operators Precedence	
Operator	Explanation
()	Parenthesis
**	Exponent
+X, -X, ~X	Unary Plus, Unary Minus, Unary NOT
*, /, //, %	Multiplication, Division, Floor Division, Modulus
+, -	Addition, Subtraction
<<, >>	Bitwise shift operators
&	Bitwise AND

Associativity of Operators

- ❑ The associativity is the order in which python evaluates an expression containing multiple operators of the same precedence.
- ❑ Except exponential operator (**) almost all operators supports **left-to-right associativity**.

```
>>> 5 * (4 - 1)
15
>>> 12 - 5 * 2
2
>>> (12 - 5) * 2
14
>>> 2 * 3 ** 2
18
```

```
>>> 6 * 5 // 4
7
>>> 55 // 7 // 2
3
>>> 2 ** 2 ** 3
256
>>> 2 ** 3 ** 2
512
```

Operator Precedence

^	Bitwise XOR
	Bitwise OR
==, !=, >, >=, <, <=, is, is not, in, not in	Comparision, Identity, Membership Operators
not	Logical NOT
and	Logical AND
or	Logical OR

Statement

- ❑ Instructions written in a code for execution are called **statements**.
- ❑ Python has different kind of statements like assignment statement, conditional statement, looping statement etc.
- ❑ Statements in Python can be extended to more than one line using parentheses (), braces {}, square brackets [], continuation character slash (\).
- ❑ Multiple statements can be written in single line using semi-colon(;).

```
sum = (1 + 2 + 3 +
      4 + 5 + 6
      + 7 + 8 )
sum = [1 + 2 + 3 +
      4 + 5 + 6
      + 7 + 8 ]
```

```
sum = 1 + 2 + 3 + \
      4 + 5 + 6 \
      + 7 + 8
sum = {1+2+
      3+4}
a = 4; b = 5; c = 6
```

Example

- ☐ Grouping of a series of statements written for a specific purpose is called a **block of code**.
- ☐ Python uses **indentation** to highlight the block of code.
- ☐ **Whitespaces** is used for **indentation** in python.
- ☐ A series of statements having **same number of whitespaces from the left** belong to the **same block of a code**.

? Questions:

Can you have a series statements in a block of code with different number of whitespaces in different lines?

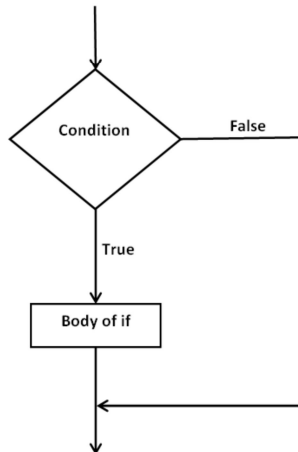
if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
```

if Statement

A simplest form of a conditional statements is the **if** statement. It executes the body/block of the code only when **if** statement is **True**.



```
if Condition:
    Statement(s)
```

if Statement

If the number is odd, print message 'The number is odd'

```
→>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
```

number ← 7

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
→>>>if 7%2 != 0:
    print("The number is
        odd")
```

```
number ← 7
Condition: 7%2 != 0
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
→    print("The number is
        odd")
```

```
number ← 7
Condition: 7%2 != 0    True
executing body of if
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
→>>>if 7%2 != 0:
    print("The number is
        odd")
```

```
number ← 7
Condition: 7%2 != 0    True
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
→The number is odd
>>>
```

```
number ← 7
Condition: 7%2 != 0    True
executing body of if
Output:
The number is odd
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
The number is odd
>>>
```

```
number ← 7
Condition: 7%2 != 0   True
executing body of if
Output:
The number is odd
```

```
>>>number = 10
>>>if 10%2 != 0:
    print("The number is
        odd")
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
The number is odd
>>>
```

```
number ← 7
Condition: 7%2 != 0   True
executing body of if
Output:
The number is odd
```

```
>>>number = 10
→>>>if 10%2 != 0:
    print("The number is
        odd")
```

```
number ← 10
Condition: 10%2 != 0
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
The number is odd
>>>
```

```
number ← 7
Condition: 7%2 != 0   True
executing body of if
Output:
The number is odd
```

```
→>>>number = 10
>>>if 10%2 != 0:
    print("The number is
        odd")
```

```
number ← 10
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
The number is odd
>>>
```

```
number ← 7
Condition: 7%2 != 0   True
executing body of if
Output:
The number is odd
```

```
>>>number = 10
→>>>if 10%2 != 0:
    print("The number is
        odd")
```

```
number ← 10
Condition: 10%2 != 0   False
```

if Statement

If the number is odd, print message 'The number is odd'

```
>>>number = 7
>>>if 7%2 != 0:
    print("The number is
        odd")
The number is odd
>>>
```

```
number ← 7
Condition: 7%2 != 0   True
executing body of if
Output:
The number is odd
```

```
>>>number = 10
>>>if 10%2 != 0:
    print("The number is
        odd")
→>>>
```

```
number ← 10
Condition: 10%2 != 0   False
Output:
```

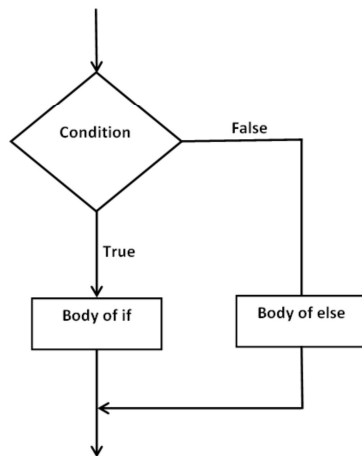
if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
```

if-else Statement

An **else** statement is used with a **if** statement to execute a block of code when the condition of **if** statement is **False**.



```
if Condition:
    Body of if
else:
    Body of else
```

if-else Statement

Check whether the number is an even or odd.

```
→number = 7
if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
```

```
number ← 7
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
→if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
```

```
number ← 7
number%2 == 0
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
        number")
→else:
    print(number,"is an odd
        number")
```

```
number ← 7
number%2 == 0  False

else:  True
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
→if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
```

```
number ← 7
number%2 == 0  False
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
        number")
else:
→ print(number,"is an odd
    number")
```

```
number ← 7
number%2 == 0  False

else:  True
executing body of else
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
           number")
else:
    print(number,"is an odd
           number")
ln[1]: 7 is an odd number
```

```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
           number")
else:
    print(number,"is an odd
           number")
ln[1]: 7 is an odd number
```

```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

```
→number = 10
if number%2 == 0:
    print(number,"is an even
           number")
else:
    print(number,"is an odd
           number")
```

```
number ← 10
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
           number")
else:
    print(number,"is an odd
           number")
ln[1]: 7 is an odd number
```

```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

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

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
           number")
else:
    print(number,"is an odd
           number")
ln[1]: 7 is an odd number
```

```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

```
number = 10
→if number%2 == 0:
    print(number,"is an even
           number")
else:
    print(number,"is an odd
           number")
```

```
number ← 10
number%2 == 0
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
ln[1]: 7 is an odd number
```

```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

```
number = 10
→if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
```

```
number ← 10
number%2 == 0  True
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
ln[1]: 7 is an odd number
```

```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

```
number = 10
if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
ln[2]: 10 is an even number
```

```
number ← 10
number%2 == 0  True
executing body of if
```

```
Output:
10 is an even number
```

if-else Statement

Check whether the number is an even or odd.

```
number = 7
if number%2 == 0:
    print(number,"is an even
        number")
else:
    print(number,"is an odd
        number")
ln[1]: 7 is an odd number
```

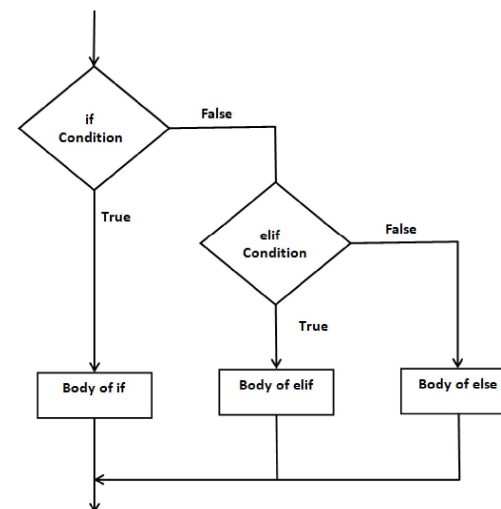
```
number ← 7
number%2 == 0  False
```

```
else:  True
executing body of else
Output:
7 is an odd number
```

```
number = 10
if number%2 == 0:
→ print(number,"is an even
    number")
else:
    print(number,"is an odd
        number")
```

```
number ← 10
number%2 == 0  True
executing body of if
```

if-elif-else Statement



```
if Condition1:
    Body of if
elif Condition2:
    Body of elif
else:
    Body of else
```


if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 20
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 20
→if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 20
number > 0
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
→number = 20
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    ("Negative")
```

```
number ← 20
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 20
→if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 20
number > 0  True
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 20
if number > 0:
→ print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 20
number > 0  True
executing body of if
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 20
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 20
number > 0  True
executing body of if
```

Output

```
Positive
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 20
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
→
```

```
number ← 20
number > 0  True
executing body of if
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
→number = 0
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 0
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
→if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 0
number > 0 False
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
→if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 0
number > 0
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
if number > 0:
    print("Positive")
→elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 0
number > 0 False

number == 0
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
if number > 0:
    print("Positive")
→ elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 0
number > 0  False

number == 0  True
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
→
```

```
number ← 0
number > 0  False

number == 0  True
executing body of elif
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
if number > 0:
    print("Positive")
elif number == 0:
→ print("Zero")
else:
    print("Negative")
```

```
number ← 0
number > 0  False

number == 0  True
executing body of elif
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = 0
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← 0
number > 0  False

number == 0  True
executing body of elif
```

Output

```
Zero
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
→if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← -5
number > 0
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
→number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    ("Negative")
```

```
number ← -5
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
→if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← -5
number > 0 False
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
→ elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← -5
number > 0  False

number == 0
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
→ else:
    print("Negative")
```

```
number ← -5
number > 0  False

number == 0  False

else:
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
→ elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number ← -5
number > 0  False

number == 0  False
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
→ else:
    print("Negative")
```

```
number ← -5
number > 0  False

number == 0  False

else:  True
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    → print("Negative")
```

```
number <- -5
number > 0  False

number == 0  False

else:  True
executing body of else
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
```

```
number <- -5
number > 0  False

number == 0  False

else:  True
executing body of else
```

Output

```
Negative
```

if-elif-else Statement

Check whether the number is positive, negative or zero.

```
number = -5
if number > 0:
    print("Positive")
elif number == 0:
    print("Zero")
else:
    print("Negative")
→
```

```
number <- -5
number > 0  False

number == 0  False

else:  True
executing body of else
```
