

## Python Conditions and If .. elif ... else statements

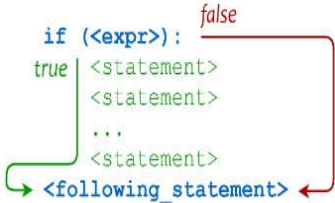
**Condition:** Python supports the usual logical conditions from mathematics (`=`, `!=`, `>`, `<=`, `>=`, `<`).

**Note:** we can create more complex logical conditions. We can use the logical "AND" (`and`), logical "OR" (`or`), logical negation (`not`) and brackets (`()`).

**Construct the truth table for the following expressions:**

- `a = 2; b = 6; print ((a == b) or (a != b)) and (b >= a))` .....
- `print (not ((a != b) and (a == b) or (b >= a)))` .....

**If, elif, else statements:** here is the complete syntax with examples

 <pre> if (&lt;expr&gt;):     &lt;statement&gt;     &lt;statement&gt;     ...     &lt;statement&gt; &lt;following_statement&gt; </pre>	<pre> if Condition:     STATEMENT1 else:     STATEMENT2 </pre>	<pre> if Condition1:     STATEMENT1 elif: Condition2:     STATEMENT2 else:     STATEMENT3 </pre>
<p><b>Type and conclude?</b></p> <pre> a=float(input('a= ')) if a &gt; 0:     print('a is positive') </pre>	<pre> a=float(input('a= ')) if a &gt; 0:     print('a is positive') else:     print('a is &lt;= 0 ') </pre>	<pre> a=float(input('a= ')) if a &gt; 0:     print('a is positive') elif a=0:     print('a is null ') else     print('a is Negative ') </pre>

**Writing scripts:**

- Write a script that asks the user for two real numbers and then informs them if their product is negative, positive or null. you should not calculate the product of the two numbers
- Write a Python program that determines whether a given number (accepted from the user) is even or odd, and prints an appropriate message to the user
- rewrite the script in -4- without using the built-in function
- Write a program that makes it possible to discern a mention for a student based on the average mark of their grades:
  - "Very good" for an average mark between 16 and 20 ( $16 \leq \text{average} \leq 20$ ).
  - "Good" for an average mark between 14 and 16 ( $14 \leq \text{average} < 16$ ).
  - "Fairly good" for an average mark between 12 and 14 ( $12 \leq \text{average} < 14$ ).
  - "Fair" for an average mark between 10 and 12 ( $10 \leq \text{average} < 12$ )
- Write a script that input two real numbers and calculates their sum if they are positives or their product if they are negatives.
- Residents of a given city pay tax according to the following rules:
  - Men over 20 pay tax
  - Women pay tax if they are between 18 and 35 years old
  - The others do not pay tax

Write a script that asks for the age and gender ('M' or 'W') of a resident and displays whether they are taxable.
- Write a script called CALCULATOR, which reads in this order:
  - The first real.
  - Arithmetic operator (+, -, \*, /).
  - The second real.

Each valid operator corresponds to a calculation that should be performed and display result or an error message, if not applicable