

Python – if / if-else Tutorial

Programs Used in the Tutorial

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Note: These programs are written in Python syntax only. C/C++ elements such as #include, main(), curly braces { }, semicolons, and return 0 are intentionally omitted. Python uses indentation to define blocks.

1. Simple if Statement

Demonstrates that the statement inside the if block executes when the condition is true.

```
x = 5

if x > 0:
    print("Positive number")
```

2. if Statement – Non-zero Condition

Uses the tutorial example where a non-zero value is treated as True.

```
x = 5

if x:
    print("Stephen Hawking")
```

3. Basic if-else Statement

Demonstrates the two possible paths of an if-else statement.

```
x = 5

if x > 10:
    print("Stephen Hawking")
else:
    print("Albert Einstein")
```

4. if-else with Equality Operator (==)

Demonstrates the difference between a condition using == and assignment using =.

```
x = 5

if x == 10:
    print("Stephen Hawking")
else:
    print("Albert Einstein")
```

5. if-else with an Arithmetic Expression

Demonstrates that an expression can be used as the condition.

```
x = 5
y = 10

if x + y:
    print("Stephen Hawking")
else:
    print("Albert Einstein")
```

6. if-else with a Relational Expression

Uses the tutorial's main example: $x + y$ is compared with 30.

```
x = 5
y = 10

if x + y > 30:
    print("Stephen Hawking")
else:
    print("Albert Einstein")
```

7. if-else with Multiple Statements

Shows how multiple statements are grouped using indentation instead of curly braces.

```
x = 5
y = 10

if x + y > 30:
    print("Stephen Hawking")
    print("Cosmology")
else:
    print("Albert Einstein")
    print("Physics")
```

8. Main Tutorial Example – Output with Multiple Statements

This is the expanded example used in the later slides. For $x = 5$ and $y = 10$, $15 > 30$ is False, so the else block executes.

```
x = 5
y = 10

if x + y > 30:
    print("Stephen Hawking")
    print("Cosmology")
else:
    print("Albert Einstein")
    print("Physics")
```

Output:

Albert Einstein
Physics

9. Indentation Demonstration

A compact example specifically for explaining that indentation replaces { } in Python.

```
if condition:
    statement1
    statement2
else:
    statement3
    statement4
```

Python Syntax Points Used in the Tutorial

- Use a colon (:) after if and else.
- Do not put a semicolon after print() statements.
- Do not use #include <stdio.h> or main() in normal Python programs.
- Do not use return 0 merely to finish a Python program.
- Python uses indentation to define the statements belonging to an if or else block.
- Four spaces are the conventional indentation level used in the tutorial examples.
- Use == for comparison and = for assignment.
- A condition such as $x + y > 30$ produces True or False.