# If-Else Statements in Python: A Complete Guide

In Python, if-else statements are used for decision-making, where the program chooses one action or another based on a condition. These statements control the flow of the program by executing a block of code only if a specified condition is true.

## 1. What is an If-Else Statement?

- if statement: Executes a block of code if a condition is true.  
- else statement: Executes a block of code if the condition is false.  
- elif statement: Used for multiple conditions, short for 'else if'.

## 2. Syntax of If-Else

if condition:  
 # Block of code if condition is true  
else:  
 # Block of code if condition is false

## 3. Example of If-Else

age = 20  
  
if age >= 18:  
 print("You are eligible to vote.")  
else:  
 print("You are not eligible to vote.")  
  
Output:  
You are eligible to vote.

## 4. The elif Statement (Multiple Conditions)

The elif statement is used when you need to check multiple conditions.  
Syntax:  
if condition1:  
 # Block of code if condition1 is true  
elif condition2:  
 # Block of code if condition2 is true  
else:  
 # Block of code if none of the conditions are true

## 5. Nested If-Else

You can place one if-else inside another. This is known as nested if-else. It allows you to check multiple conditions in a hierarchy.

## 6. One-Line If-Else (Ternary Operator)

Python allows you to write an if-else statement in a single line, which is useful for short conditions.  
Syntax:  
value = true\_value if condition else false\_value

## 7. Logical Conditions in If-Else

You can use logical operators (and, or, not) in if statements to combine multiple conditions.

## 8. Indentation in Python If-Else

Python relies on indentation (spaces or tabs) to define blocks of code. All statements within an if or else block must have the same indentation.

## 9. Common Errors in If-Else Statements

1. Incorrect Indentation: Ensure consistent indentation; Python will raise an IndentationError if not.  
2. Using = instead of ==: = is for assignment, while == is for comparison.  
3. Forgetting the Colon (:): Every if, elif, and else must end with a colon.

## 10. Practical Use Cases of If-Else

Example 1: Login System

username = "admin"  
password = "1234"  
  
if username == "admin" and password == "1234":  
 print("Login successful")  
else:  
 print("Invalid credentials")

Example 2: Temperature Check

temperature = 35  
  
if temperature > 30:  
 print("It's a hot day.")  
elif temperature > 20:  
 print("It's a nice day.")  
else:  
 print("It's a cold day.")