2- Conditional Statements

Conditional Statements in Python

Objective: Execute actions only if a certain condition is verified.

Syntax in Python:

```
if condition:
    # instructions to execute if the condition is true
```

The condition is a boolean expression.

Note:

- Indentation is crucial in Python. It indicates which block an instruction belongs to and is mandatory.

If...Else Statements

Objective: Execute different actions based on whether a certain condition is verified or not.

Syntax in Python:

```
if condition:
    # instructions to execute if the condition is true
else:
    # instructions to execute if the condition is false
```

Note: The `else` statement is not followed by a condition.

Example:

```
x = float(input("Enter a number:"))

if x > 0:
    print(x, "is greater than 0")
    print("It is strictly positive")
else:
```

```
    print(x, "is negative or zero")

print("End")
```

If...Elif...Else Statements

Objective: Chain multiple conditions.

Example: Calculating the number of real roots of a quadratic equation

Given a quadratic equation: $f(x) = ax^2 + bx + c$

Roots are the values of x that satisfy the equation $f(x) = 0$.

Calculate the discriminant: $\Delta = b^2 - 4ac$

- $\Delta > 0$: 2 real roots
- $\Delta = 0$: 1 real root
- $\Delta < 0$: 0 real roots

Example:

```
a = 3.2  # coefficient of the x^2 term
b = 5    # coefficient of the x term
c = -7.9 # constant term

d = b**2 - 4*a*c  # discriminant

if d > 0:
    print("Two distinct real roots")
elif d == 0:
    print("One real root")
else:
    print("No real roots")
```

Use as many `elif` blocks as needed.