IF-ELSE STATEMENT

In Python, the `if-else` statement is used to control the flow of a program based on a certain condition. It allows you to execute a block of code if a specified condition is true and another block of code if the condition is false. Here's a detailed explanation with examples:

Basic Syntax:

```python
if condition:
    # Code to be executed if the condition is true
else:
    # Code to be executed if the condition is false
```

Example 1: Simple if-else statement:

```python
# Example 1: Simple if-else statement

# Get user input
age_str = input("Enter your age: ")

# Convert input to an integer
age = int(age_str)

# Check if the person is eligible to vote
if age >= 18:
    print("You are eligible to vote!")
else:
    print("Sorry, you are not eligible to vote yet.")
```

In this example, the program checks if the user's age is greater than or equal to 18. If the condition is true, it prints a message saying the person is eligible to vote; otherwise, it prints a message saying they are not eligible.

Example 2: Nested if-else statements:

```python
# Example 2: Nested if-else statements


# Get user input
number_str = input("Enter a number: ")


# Convert input to an integer
number = int(number_str)


# Check if the number is positive, negative, or zero
if number > 0:
    print("The number is positive.")
elif number < 0:
    print("The number is negative.")
else:
    print("The number is zero.")
```

In this example, the program checks whether the entered number is positive, negative, or zero using a combination of `if`, `elif` (short for "else if"), and `else` statements.

Example 3: Multiple conditions:

```python
# Example 3: Multiple conditions

# Get user input
mark_str = input("Enter your exam mark: ")

# Convert input to an integer
mark = int(mark_str)

# Determine the grade based on the mark
if mark >= 90:
    grade = "A"
elif mark >= 80:
    grade = "B"
elif mark >= 70:
    grade = "C"
elif mark >= 60:
    grade = "D"
else:
    grade = "F"

# Display the grade
print(f"Your grade is {grade}.")
```

In this example, the program determines the grade based on the entered exam mark, considering multiple conditions using `if` and `elif`.

These examples showcase the basic usage of the `if-else` statement in Python. It's a fundamental construct for making decisions in your programs based on certain conditions.