Print Statement and Decision Control Structures in Python

By

Prof. Muhammad Iqbal Bhat

Government Degree College Beerwah

Prof. M. Iqbal Bhat (JKHED)

Topics

- Print Statement in Python
- Decision Control Structures in Python

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Print Statement

The print statement is used to display output in Python.

The basic syntax of the print statement is:

```
print(value1, value2, ..., sep=' ', end='\n',
file=sys.stdout, flush=False).
```

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Printing a single value:

```
print("Hello, world!")
```

Printing multiple values:

```
name = "John"
age = 30
print("My name is", name, "and I am", age,
"years old.")
```

Changing the separator

```
name = "John"
age = 30
print("My name is", name, "and I am", age,
"years old.", sep="-")
```

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Changing the end character:

```
print("Hello, world!", end="")
print("How are you?")
```

Using string formatting:

```
name = "John"
age = 30
print("My name is {} and I am {} years old.".format(name, age))
```

Using f-strings

```
name = "John"
age = 30
print(f"My name is {name} and I am {age} years old.")
```

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Decision Control Structures

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Decision Control Structures in Python:

Decision control structures are used to control the flow of a program based on certain conditions.

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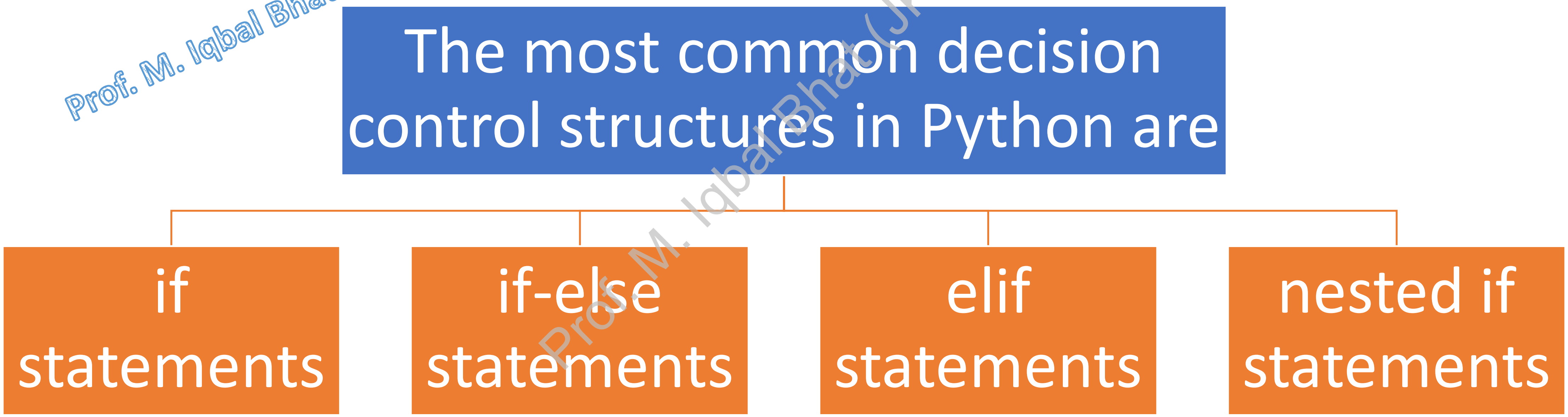

The most common decision control structures in Python are

if statements

if-else statements

elif statements

nested if statements

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If statement:

The syntax of an if statement is as follows

```
if condition:
    statement(s)
```

If the condition is true, the statement(s) will be executed. Otherwise, they will be skipped.

Example

```
x = 10
if x > 5:
    print("x is greater than 5")
```

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Blocks in Python

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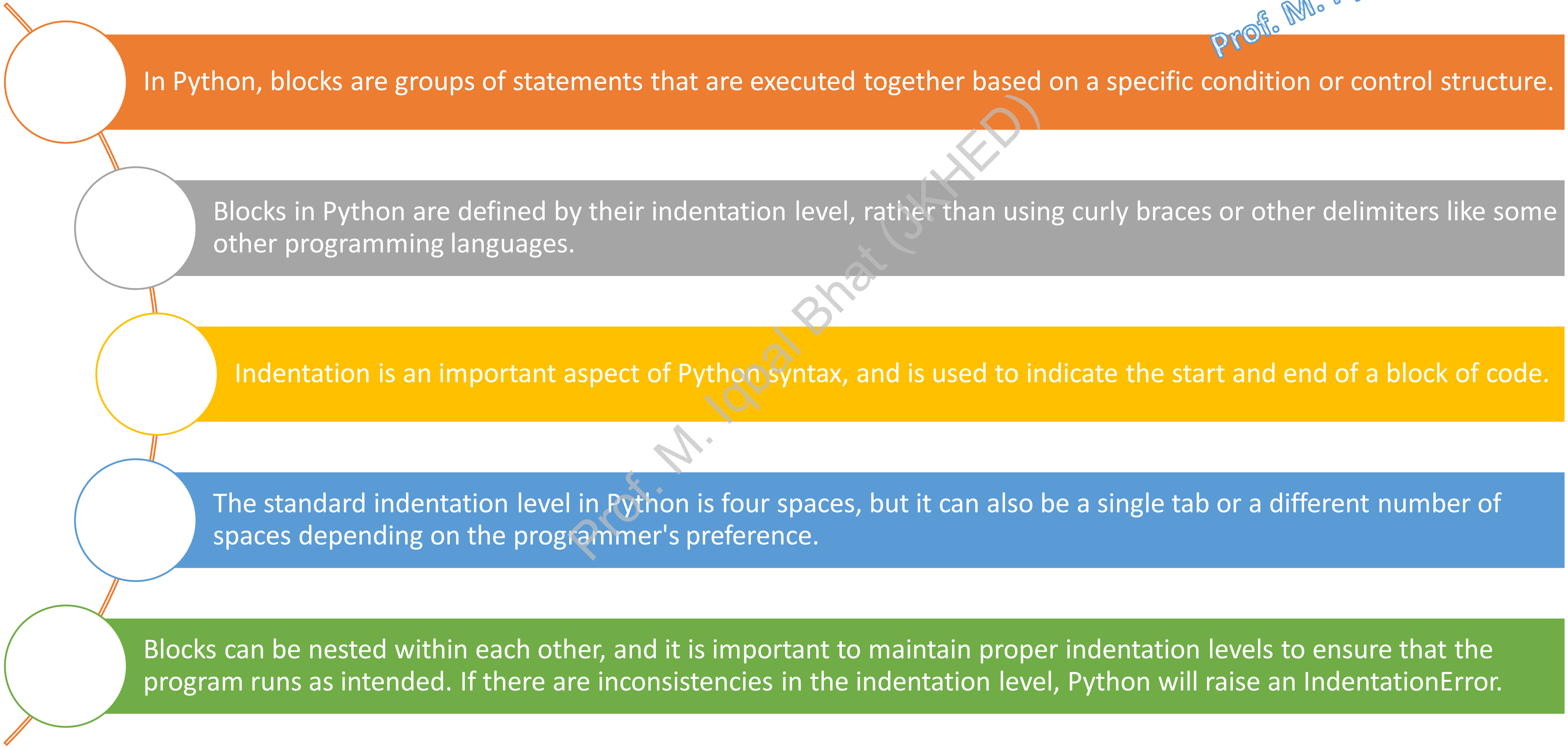

In Python, blocks are groups of statements that are executed together based on a specific condition or control structure.

Blocks in Python are defined by their indentation level, rather than using curly braces or other delimiters like some other programming languages.

Indentation is an important aspect of Python syntax, and is used to indicate the start and end of a block of code.

The standard indentation level in Python is four spaces, but it can also be a single tab or a different number of spaces depending on the programmer's preference.

Blocks can be nested within each other, and it is important to maintain proper indentation levels to ensure that the program runs as intended. If there are inconsistencies in the indentation level, Python will raise an IndentationError.

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Blocks in Python (example)

```
x = 5
if x > 0:
    print("x is positive")
    if x % 2 == 0:
        print("x is even")
    else:
        print("x is odd")
else:
    print("x is negative")
```

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If-else statement:

The syntax of an if-else statement is as follows

```
if condition:
    statement(s) if condition is true
else:
    statement(s) if condition is false
```

Example

```
x = 2
if x % 2 == 0:
    print("x is even")
else:
    print("x is odd")
```

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elif statement:

The syntax of an elif statement is as follows

```
if condition1:
    statement(s) if condition1 is true
elif condition2:
    statement(s) if condition2 is true and condition1 is false
else:
    statement(s) if both condition1 and condition2 are false
```

Example

```
x = 2
if x > 5:
    print("x is greater than 5")
elif x > 0:
    print("x is positive")
else:
    print("x is negative")
```

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Nested if statements:

> The syntax of an nested if-else statement is as follows

```
if condition1:
    statement(s) if condition1 is true
    if condition2:
        statement(s) if both condition1 and condition2 are true
    else:
        statement(s) if condition1 is true and condition2 is false
else:
    statement(s) if condition1 is false
```

> Example

```
x = 2
if x > 5:
    print("x is greater than 5")
else:
    if x > 0:
        print("x is positive")
    else:
        print("x is negative")
```

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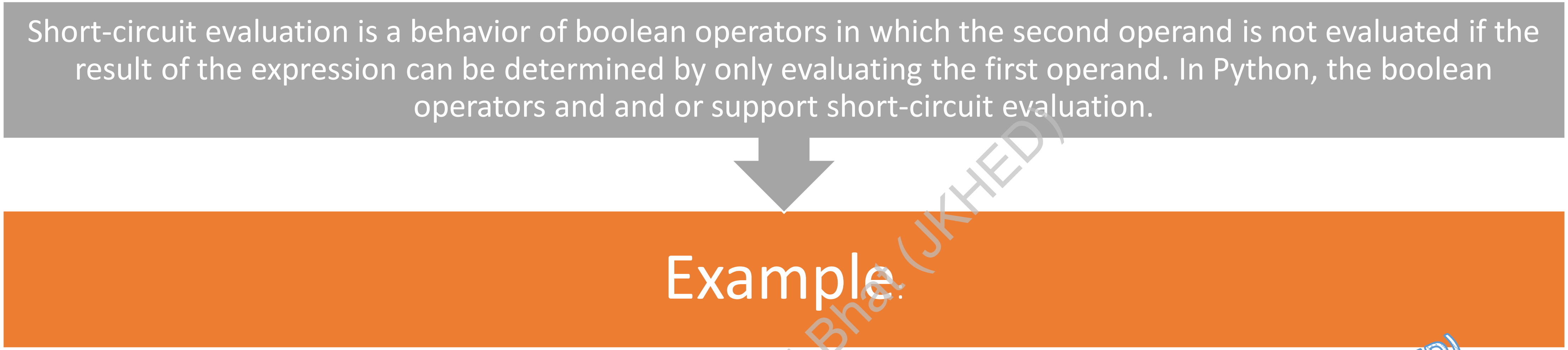
Short-circuit evaluation:



Short-circuit evaluation is a behavior of boolean operators in which the second operand is not evaluated if the result of the expression can be determined by only evaluating the first operand. In Python, the boolean operators and and or support short-circuit evaluation.

Example:

```
x = 5
y = 0
if x > 0 and y > 0:
    print("Both x and y are positive")
else:
    print("At least one of x and y is non-positive")
```

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Ternary operator:

The ternary operator, also known as the conditional operator, is a shorthand way of writing an if-else statement in Python. It allows us to write a single expression that produces a value based on a condition, rather than writing a full if-else statement.

Syntax:

```
value_if_true if condition else value_if_false
```

Example

```
x = 5
y = 10
max_value = x if x > y else y
print(max_value)
```

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Examples in Python

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1. Program to calculate the area of a rectangle

```
length = float(input("Enter length of rectangle: "))

width = float(input("Enter width of rectangle: "))

area = length * width

print("The area of the rectangle is:", area)
```

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2. Program to check if a number is even or odd

```
num = int(input("Enter a number: "))

if num % 2 == 0:
    print(num, "is even")
else:
    print(num, "is odd")
```

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3. Program to convert temperature from Celsius to Fahrenheit

```
celsius = float(input("Enter temperature in Celsius: "))

fahrenheit = (celsius * 1.8) + 32

print(celsius, "Celsius = ", fahrenheit, "Fahrenheit")
```

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