Course Title: Programming Language II

Course Code: CSE 111

Semester: Summer 2020

Topic: Introduction to Conditional Statements

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1.Concept of if else

1.1 Non sequential program statements:

Non sequential program statements refer to execution of a specific segment of the code based on the boolean outcome of the conditional statement. If else statement is a type of non sequential statement in which either if or else segment executes based on the True or False values respectively.

1.2 Branching:

Branching is the point of decision making through the execution of a certain part in the program rather than one-by-one execution. Basically, it follows the non procedural order or unordered execution of a program which makes the program smarter.

1.3 Code execution based on decisions:

Decision based code execution involves behavioral change of the program whenever it generates output based on a decision. Decision depends on the True or False output of the conditions.

1.4 Decision making statements:

In this note, we will discuss the decision making statements in Python which are: if statement, if..else statement, if elif [**Short form of else if**] ladder and nested if statements one by one. All of these are described as logical testing that directs to decision making.

2. Logical Conditions

Logical conditions have True or False output depending on whether both of the operands are true or false. Logical conditions used in Python are given below:

- Equals: a == b (True, if a and b are equals)
- Not Equals: a != b (True, if a and b are not equals)
- Less than: a < b (True, if a is less than b)
- Less than or equal to: a <= b (True, if a is less than or equal b)
- Greater than: a > b (True, if a is greater than b)
- Greater than or equal to: a >= b (True, if a is greater than or equal b)
- in keyword
- is keyword

3. if Statement:
3. if Statement: if statement is the first conditional statement in Python that executes the statement only when the expression in the 'if' statement is True. 'if' block is followed by indentation which is mandatory in Python.

Flowchart of if statement   **Syntax**
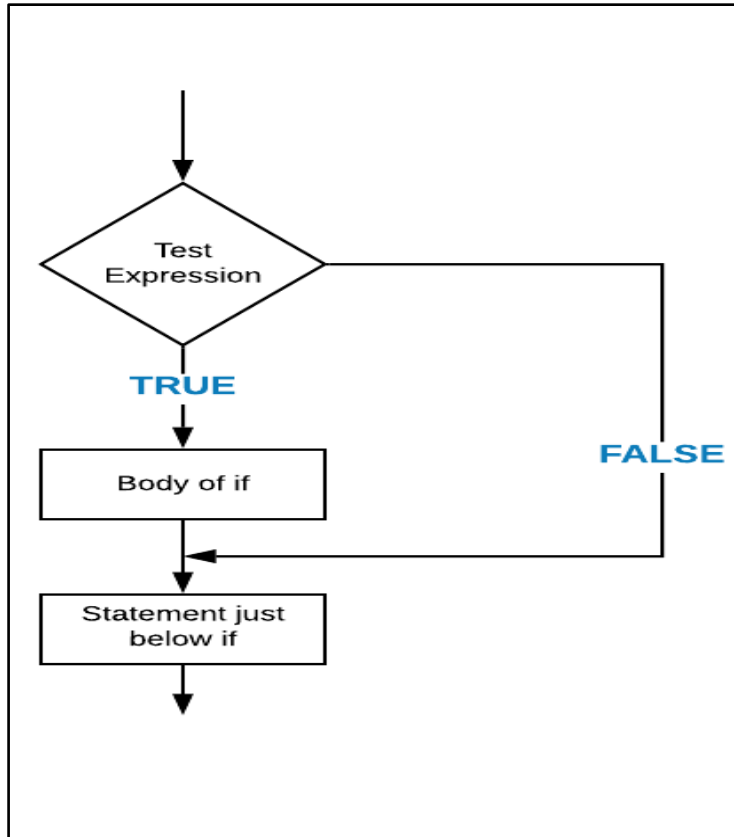

```
if test_expression:
    Body of if
else:
    Body of else
Rest of the codes…
if (it is sunny):
    I'll play cricket
else:
    I'll play indoors
```
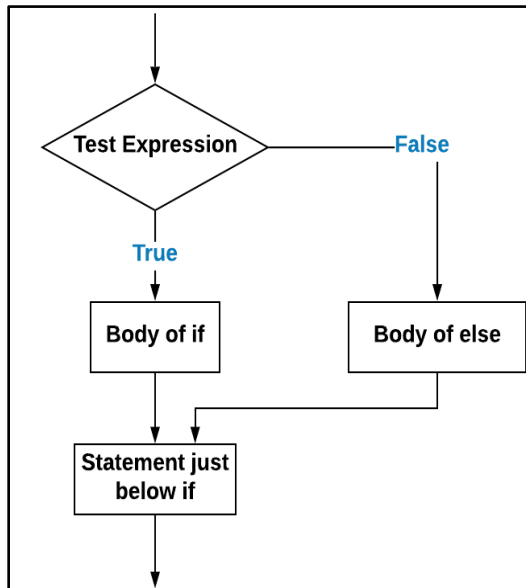
Example of if statement:
```
message = True
if message==True:
    print("Welcome To BRAC University")
```

Output: `Welcome To BRAC University`

4. if.. else Statement: if.. else statement is the second conditional statement in Python that executes either the expression in the 'if' statement or the expression in the else statement depending on the boolean value true and false.

Flowchart of if.. else statement   **Syntax**


```
if test_expression:
    Body of if
else:
    Body of else
Rest of the codes…
if (it is sunny):
    I'll play cricket
else:
    I'll play indoors
```
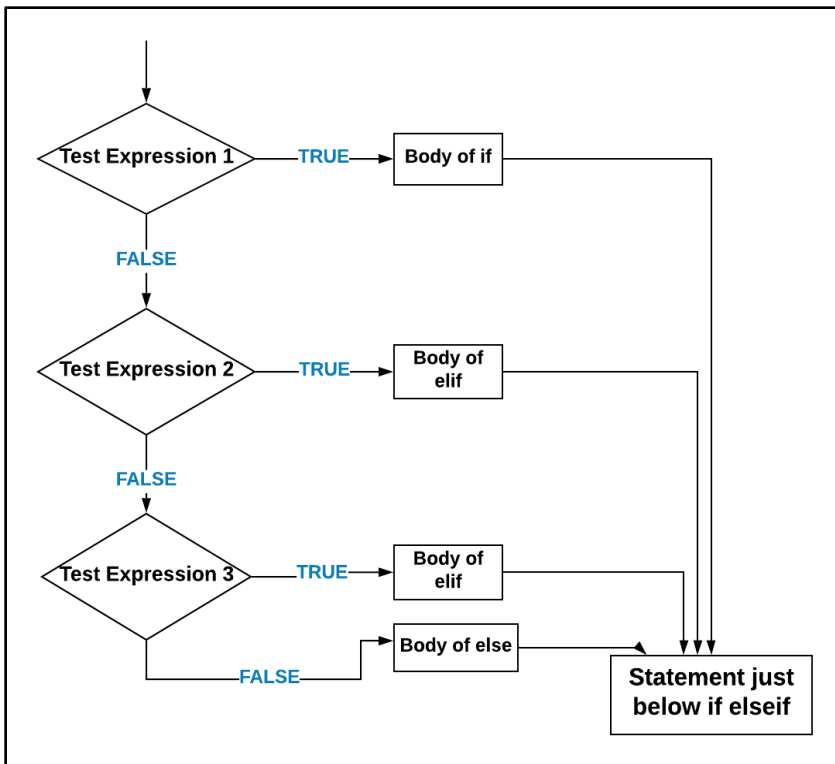
Example of if.. else statement:
```
 number = 15
if number<10:
    print("Below 10")
else:
    print("Above 10")
```

Output: Above 10

5. if.. elif Statement: if elif statement executes another expression in the 'elif' statement before executing the else statement when the condition of 'if' statement is false.

Flowchart of if.. elif statement

Syntax

```
if test_expression1:
    Body of if
elif test_expression2:
    Body of elif
elif test_expression3:
    Body of elif
else:
    Body of else
Rest of the codes…
```

Example of if.. elif statement:

```
Age = 40
if Age<10:
    print("No bus fare for children.")
elif 10<Age<30:
    print("Student fare")
elif 30<Age<65:
    print("Regular fare")
else:
    print("Half fare for senior citizens")
```

Output: Regular fare

6. Nested if Statement:

6. Nested if Statement: This statement can have another 'if.. elif.. else' statement inside the 'if' statement before executing the else statement of the outer 'if' statement. This is called nested if statement.

Syntax

```
if test_expression1:
  if test_expression2:
   Body of nested_if
  else:
   Body of nested_else
else:
 Body of else
```

Example of nested if statement

```
num1 = 10
num2 = 7
if num1>=num2:
   if num1>num2:
    print("num1 is greater than num2")
   else:
    print("num1 and num2 are equal")
else:
   print("num1 is less than num2")
```

Output: num1 is greater than num2

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