

Experiment: 3

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Subject: Python Lab

Experiment – 3: Python Conditional Statements

1. Aim: To implement a Python program to demonstrate conditional statements.

2.Objectives: After performing this experiment, the student will be able to understand and write conditional statements in Python.

3.Outcomes: Students shall be able to **understand** the structure, syntax and semantics of a Python program. (LO-404.1).

4.Prerequisite: Knowledge of Python data types, basics of conditional statements

5.Requirements: Personal Computer (PC), Windows /Linux Operating System, Python IDE

1. Pre-Experiment Exercise:

Theory:

Python provides three important conditional statements:

- i. If statement: if statement consists of a Boolean expression followed by one or more statements. When the condition is satisfied, the 'if' block is executed. Otherwise, the control skips the code under the 'if' block and reaches the statement after the 'if' block.

Syntax:
if *condition*:
 Indented statement(s)

- ii. If...else statement: if statement can be followed by an optional else statement, which executes when the Boolean expression is FALSE.

Syntax:
if *condition*:
 Indented statement(s)
else:
 Indented statement(s)

- iii. Nested if... else statement: You can use one if or elif statement inside another if or elif statement(s). When any of the conditions is 'True', its block of code is executed. Unlike the 'else' statement, there can be any number of 'elif' statements followed by a single 'if'.

Syntax:
if *condition1*:
 Indented statement(s)
elif *condition2*:
 Indented statement(s)
elif *condition3*:
 Indented statement(s)
...
else:
 Indented statement(s)

2. Laboratory Exercise

A. Procedure

- Open IDE for Python programming
- Open new Python file from menu file-new
- Type Python code with proper syntax
- Save file with .py extension
- Execute the command statements inside the saved file using ctrl+enter key and explore results in other windows of IDE.

3. Post-Experiments Exercise

A. Extended Theory:

- Draw flowchart for 'if' statements used in Python, give all labels.

Ans:

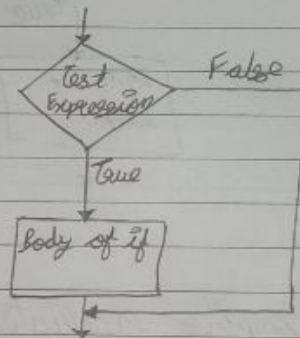
3. Post Experiment Exercise:-

A. Extended Theory:-

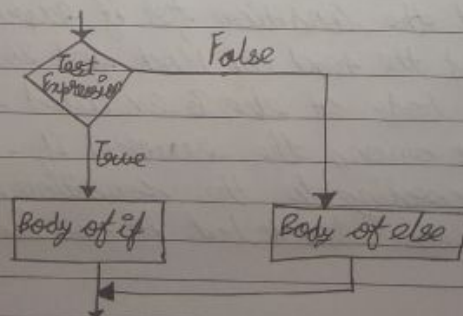
- Draw a flow chart for 'if' statements used in python give all labels.

Ans

(i) if Statement



(ii) if-else Statement

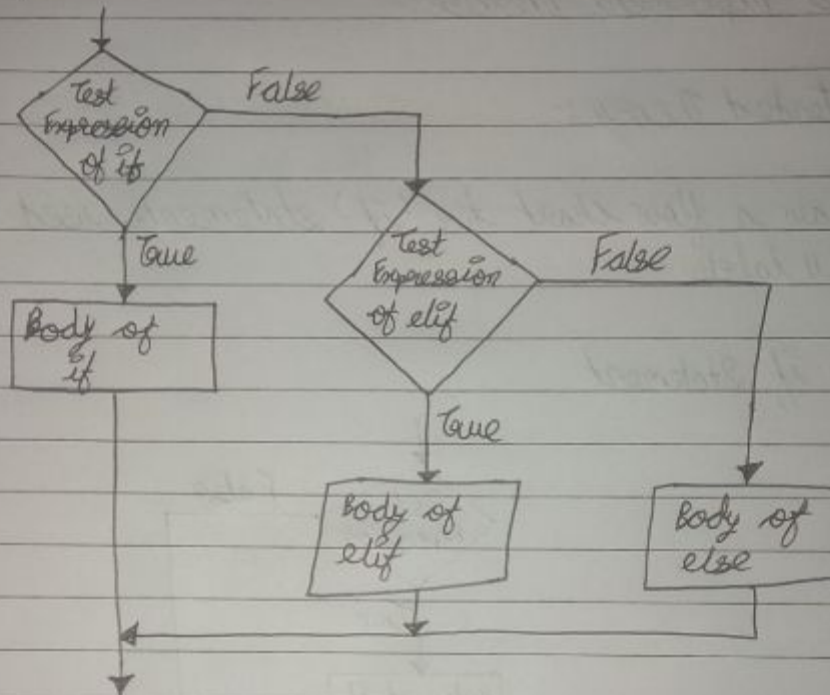


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(2)

(ii) If-elif-else statement



2. Explain how the compiler evaluates 'if...elif...else' statements, Draw flowchart for the same.

Ans:

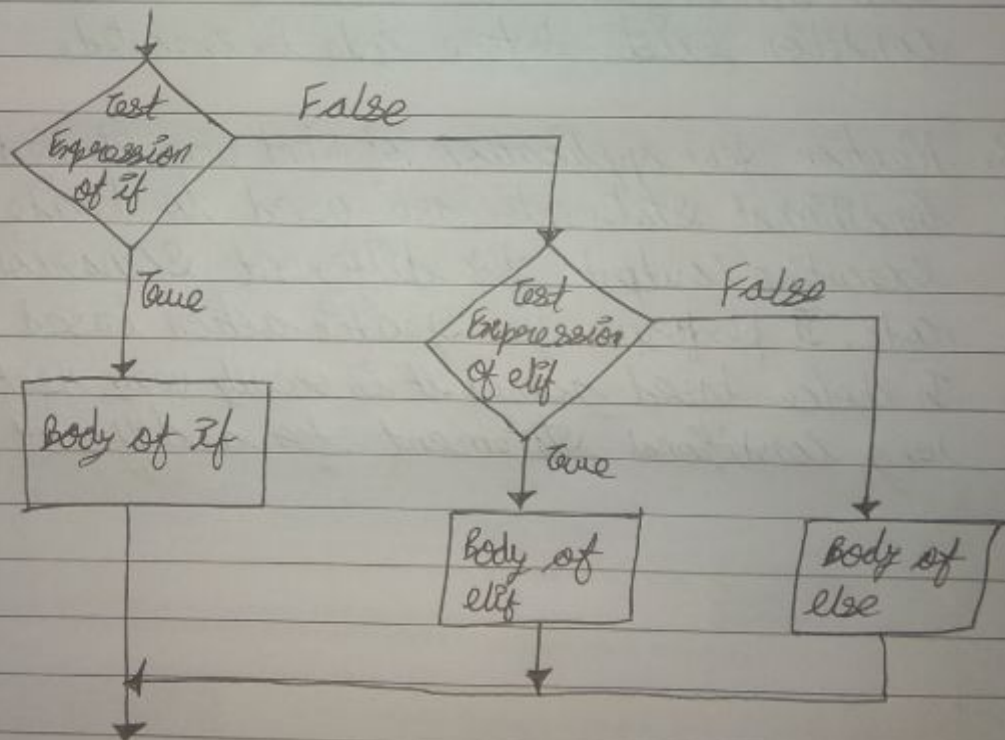
(2) Explain how the compiler evaluates 'if-elif-else' statements. Draw flow chart for the same.

Ans: The elif is short for else if. It allows us to check for multiple expressions. If the condition for if expression is false, it checks the condition of the next elif block and so on. If all the conditions are false, the body of else is executed.

Only one block among the several if-elif-else blocks is executed according to the condition. The if block can have only one else block but it can have multiple elif blocks.

Syntax :-
 if test expression
 Body of if
 elif test expression
 Body of elif
 else
 Body of else

Flowchart :-



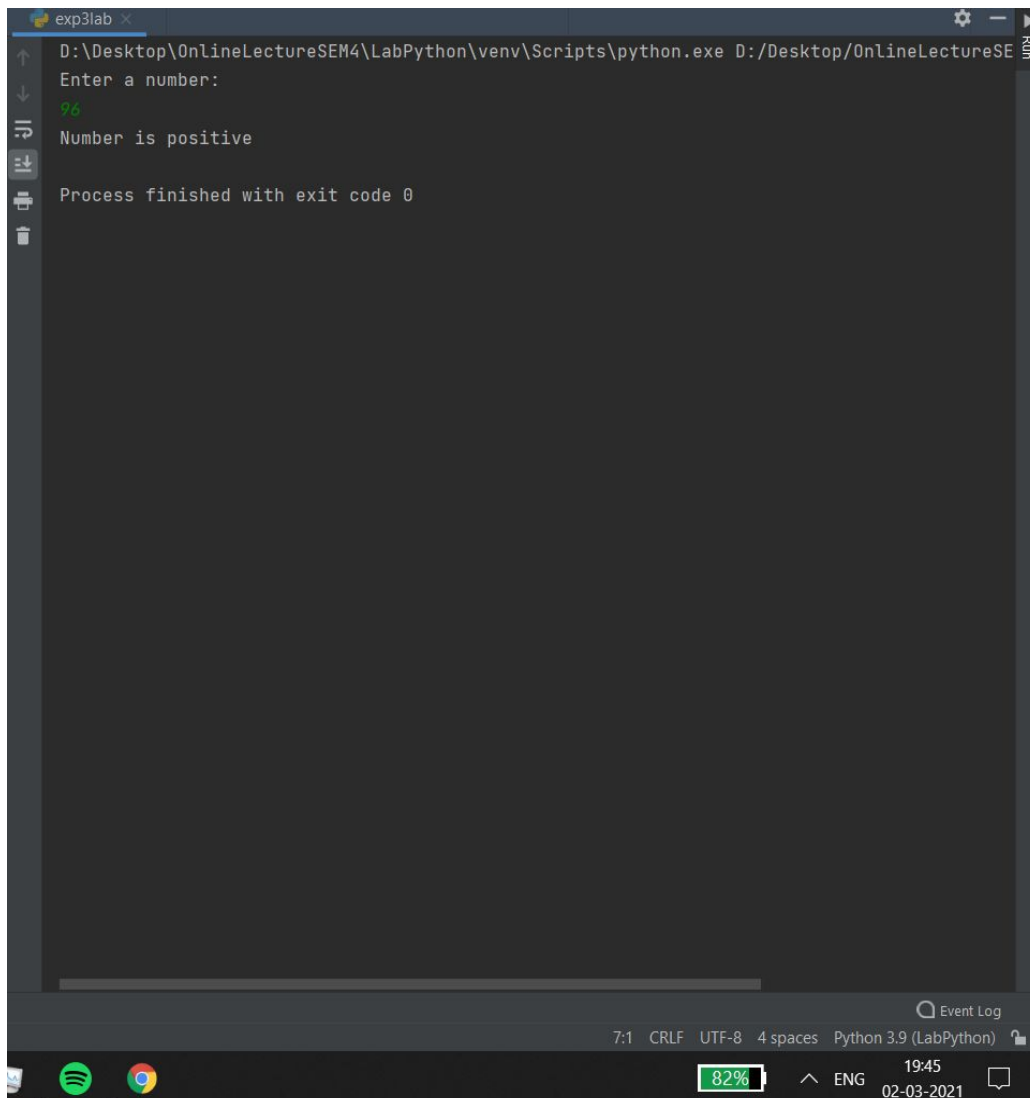
B. Questions/Programs:

1. Write a Python program to check and print if the inputted number is 'positive', 'negative' or 'zero'.

Program:

```
a=int(input("Enter a number:\n"))
if(a<0):
    print("Number is negative")
elif(a>0):
    print("Number is positive")
else:
    print("Number is 0")
```

Output:



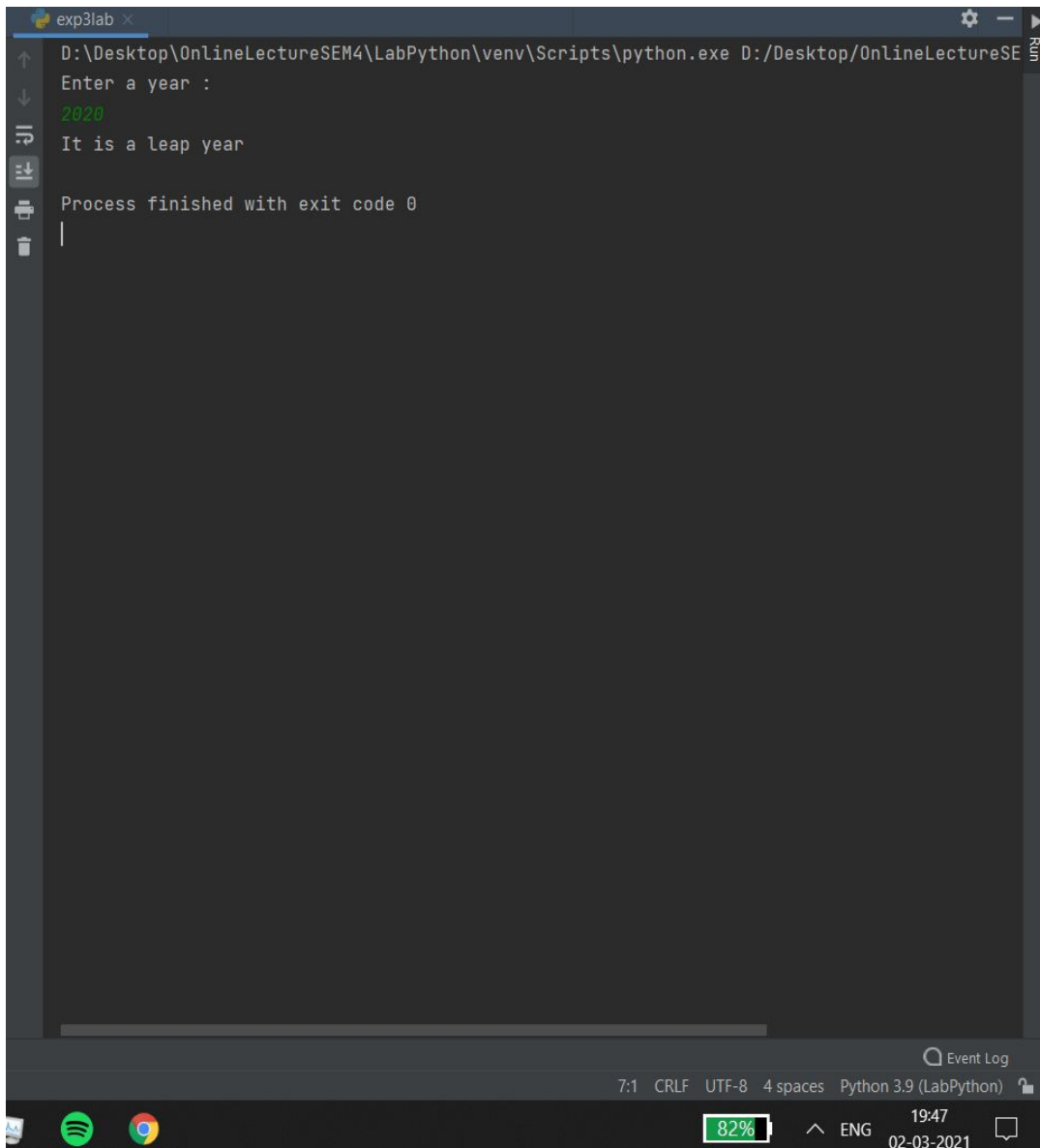
The screenshot shows a Python IDE window titled 'exp3lab'. The command prompt shows the execution of a Python script at the path 'D:\Desktop\OnlineLectureSEM4\LabPython\venv\Scripts\python.exe'. The script prompts the user to 'Enter a number:' and the user enters '96'. The output of the script is 'Number is positive'. The process finished with exit code 0. The IDE interface includes a file explorer on the left, a terminal at the bottom, and a status bar at the very bottom showing settings like '7:1 CRLF UTF-8 4 spaces Python 3.9 (LabPython)' and the date '02-03-2021'.

2. Write a program to check whether the input year is a leap year or not.

Program:

```
year = int(input("Enter a year : \n")) # taking input year from user
if (year % 4) == 0: #checking all 3 conditions using nested if
    if (year % 100) == 0:
        if (year % 400) == 0:
            print("It is a leap year")
        else:
            print("It is not a leap year")
    else:
        print("It is a leap year")
else:
    print("It is not a leap year")
```

Output:



The screenshot shows a terminal window titled 'exp3lab'. The command prompt is 'D:\Desktop\OnlineLectureSEM4\LabPython\venv\Scripts\python.exe D:/Desktop/OnlineLectureSEM4\LabPython\venv\Scripts\python.exe'. The program prompts 'Enter a year :', and the user enters '2020'. The program outputs 'It is a leap year'. Below this, it says 'Process finished with exit code 0'. The terminal window is part of a desktop environment with a taskbar at the bottom showing icons for Spotify, Chrome, and a battery level of 82% at 19:47 on 02-03-2021.

```
exp3lab x
D:\Desktop\OnlineLectureSEM4\LabPython\venv\Scripts\python.exe D:/Desktop/OnlineLectureSEM4\LabPython\venv\Scripts\python.exe
Enter a year :
2020
It is a leap year
Process finished with exit code 0
|
```


3. Write a program to print Fibonacci sequence with the help of the if-else.

Program:

```
num = int(input("Enter the number of terms : "))
count = 0
n1 = 0 #initial term
n2 = 1 #second term of the series
if num < 0:
    print("Enter a valid number")
else:
    print("Series is : ")
    print(n1)
    while count < num - 1:
        n = n1 + n2 #adding the initial and second term to get the next term in the series
        print(n)
        n1 = n2
        n2 = n
        count = count + 1
```

Output:



The screenshot shows a terminal window titled 'exp3lab' with the following content:

```
D:\Desktop\OnlineLectureSEM4\LabPython\venv\Scripts\python.exe D:/Desktop/OnlineLectureSE
Enter the number of terms : 9
Series is :
0
1
2
3
5
8
13
21
34

Process finished with exit code 0
|
```

At the bottom of the terminal window, there is a status bar showing '15:1 CRLF UTF-8 4 spaces Python 3.9 (LabPython)' and a taskbar at the very bottom with icons for Spotify, Chrome, and a battery level of 82%.

C. Conclusion:

1. Write what was performed in the experiment/program.
2. What is the significance of experiment/program?
3. Mention a few applications of what was studied.

Ans:

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D. Conclusion :-

1. Write what was performed in the Experiment/program?
Ans In this experiment we studied and implemented conditional statements in python. They were if statement, if else, nested if else and if elif else statements.
2. What is the significance of experiment/program?
Ans The significance of the experiment is that a conditional statement is used to determine whether a certain condition exists before code is executed.
3. Mention few application of what was studied
Ans Conditional statements are used to decide the flow of execution/output for different scenarios in a particular code. It performs the specific action based on the conditions. In choice based games it is really very useful to implement using conditional statement for a different ending to story.

D. References

- [1] MT Savaliya, "Programming through Python", StarEdu Solutions India Pvt.
- [2] <https://www.python.org/>
- [3] www.pythonforbeginners.com

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