Centre for Differently Abled Persons
Bharathidasan University

III BCA – V SEMESTER

PYTHON PROGRAMMING

(20UCA5CC6)

UNIT – III

Prepared by
Dr. M. Prabavathy
Ms. M. Hemalatha

UNIT – III

Input and Output Statements

- **Input**
  - A value can be input from the user with the help of input() method
  - The syntax is as follow: variable_name = input(“Enter any number”)
  - Input method return a string.
  - It can be changed to other datatypes by using type.
  - Example: age = int(input(“Enter your age”))

Strings

- **Output**
  - A statement is print with the help of print() method.
  - The syntax to use print() is as follow :
    - >>>print(“message to be printed” or ‘message to be printed’) Or
    - >>>print(variable_name)
    - Or
    - >>>print(“message to be printed”, variable_name) Or
    - >>>print(‘message to be printed’, variable_name)

- Strings are amongst the most popular types in Python.
- We can create them simply by enclosing characters in quotes.
- Python treats single quotes the same as double quotes.
- Creating strings is as simple as assigning a value to a variable.
- For example: var1 = 'Hello World!'

String Special Operators

Accessing Values in Strings

- Python does not support a character type; these are treated as strings of length one, thus also considered a substring.
- To access substrings, use the square brackets for slicing along with the index or indices to obtain your substring.
- For example:
  - var1 = 'Hello World!'
  - var2 = "Python Programming" print "var1[0]: ", var1[0]
  - print "var2[1:5]: ", var2[1:5]
- Output

  var1[0]:

  H
  - var2[1:5]: ytho

String Formatting Operator

- Assume string variable **a** holds 'Hello' and variable **b** holds 'Python', then

Operator	Description	Example
+	Concatenation - Adds values on either side of the operator	a + b will give HelloPython
*	Repetition - Creates new strings, concatenating multiple copies of the same string	a*2 will give -HelloHello
[]	Slice - Gives the character from the given index	a[1] will give e
[:]	Range Slice - Gives the characters from the given range	a[1:4] will give ell
in	Membership - Returns true if a character exists in the given string	H in a will give 1
not in	Membership - Returns true if a character does not exist in the given string	M not in a will give 1

- The format operator % is unique to strings and makes up for the pack of having functions from C's printf() family.
- For example: print "My name is %s and weight is %d kg!" % ('Zara', 21)
- The Output is: My name is Zara and weight is 21 kg!

Format Symbol	Conversion
%c	character
%s	string conversion via str() prior to formatting
%d	signed decimal integer
%u	unsigned decimal integer
%o	octal integer
%x	hexadecimal integer (lowercase letters)
%e	exponential notation (with lowercase 'e')
%f	floating point real number

Single Quotes

- Single quotes are used to mark a quote within a quote or a direct quote in a news story headline.

Code	Output
word = 'Ask?' print(word) name = '"Hi" ABC' print(name) congrat = 'We congrat's you.' print(congrat)	 Ask? "Hi" ABC Invalid Syntax

Double Quotes

- A double quotation mark is to set off a direct (word-for-word) quotation.
- In Python Programming, we use Double Quotes for string representation.

Code	Output
wish = "Hello World!" print(wish) hey = "AskPython says "Hi"" print(hey) famous ="'TajMahal' is in Agra." print(famous)	Hello World! Invalid Syntax 'TajMahal' is in Agra.

- **Differences Between Single and Double Quotes**

Single Quotation Mark	Double Quotation Mark
Represented as ‘ ‘	Represented as ” “
Single quotes for anything that behaves like an Identifier.	Double quotes generally we used for text.
Single quotes are used for regular expressions, dict keys or SQL.	Double quotes are used for string representation.
Eg. ‘We “welcome” you.’	Eg. “Hello it’s me.”

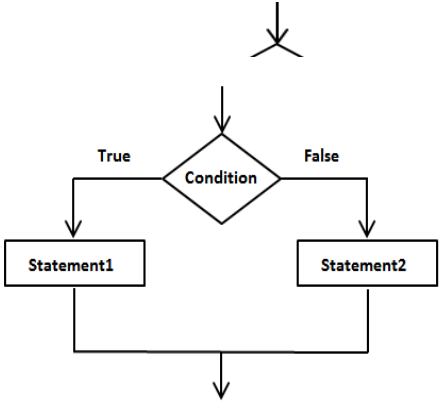
Control statements

- It is used to control the sequence of execution of statements written in a program.

Triple Quotes

- Python's triple quotes allow strings to span multiple lines, including NEWLINEs, TABs, and any other special characters.
- The syntax for triple quotes consists of three consecutive single or double quotes.
  - a = """Python is a programming language (\t) that lets you work quickly. \nIt integrates systems more efficiently."""
  - printa
- Output
  - Python is a programming language
    that lets you work quickly. It
    integrates systems more efficiently.

- Without using Control structure sequence of execution of statements in a program is line by lineand every statement is executed once. We can divide the control structure into two parts
    1. Conditional control structure
    2. Looping/iterative control structure
- **Conditional Control Structure**
    - Conditional is used in situations where the execution of statements control structure dependsupon the result of condition i.e. true or false.
    - It is of 3 types Conditional control structure. They are
        1. if
        2. if....else
        3. if.....elif..... else



1. **if statement**
   - In this control structure, statement will execute only if the given condition is true.
   - Syntax& Flowchart:
     - if (condition) :
       - Statement/s

2. **if…else statement**
   - In this control structure, if the given condition is true set of statement1 will be executed.

- Otherwise set of statement2 will be executed.
- Syntax & Flowchart:

```
if (condition) :
  Statement1 else
  Statement2
```

3.if…elif…else statement

- In this control structure, if condition1is true set of statement1 will be executed.
- Else condition2 is true; set of statement2 will be executed.
- This process will be repeated upto condition N.
- If condition N is true; set of statement(N) will be executed.
- Otherwise set of statement(N+1) will be executed.

- Syntax & Flowchart:

if (condition 1) :

Statement1 elif(condition 2) :

Statement 2

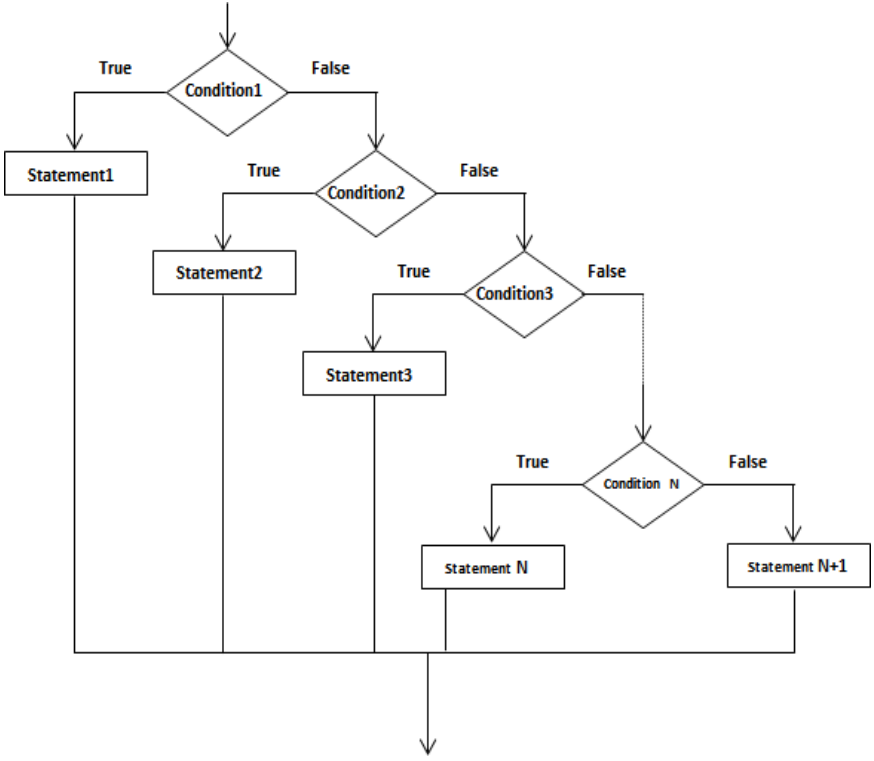
.

.

elif (condition N) :

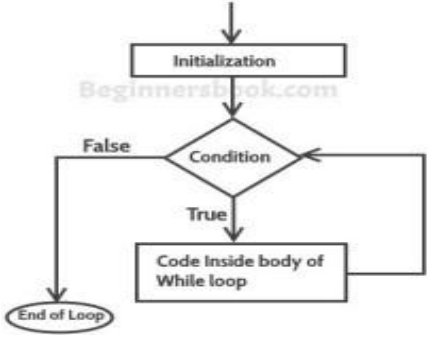
Statement N else

Statement N+1



Looping Control Structure

- This control structure is used to execute a set of statements multipletimes on the basis of condition.
- Loop is controlled by the loop counter.
- We need to initialize,update and use the counter in loop termination condition.
- Python has two types of loops



1. **While Loop :**
   - The body of the loop is executed again and again until the loopcondition become false.
   - Syntax :

     initialization
     - while (condition):

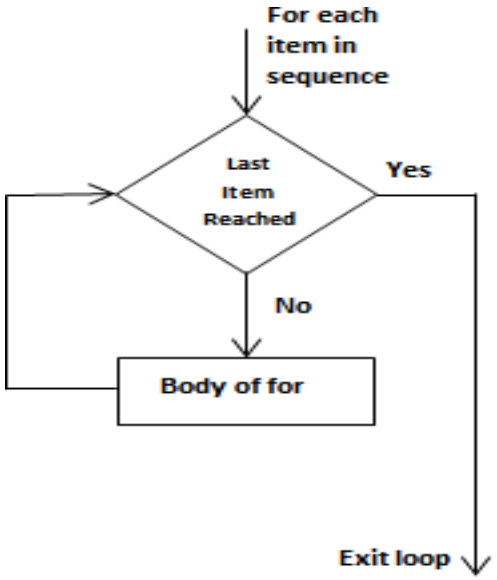
     Statement(s)
     - incr / decr
   - Example:Program to find print 10 numbers i = 1
     - while (i < 10):
       - print(" \n I = ", i)

         i = i+1

2. FOR loop :

- For loops are used for sequential traversal. This loop issued when you know in advance that how many times the loop will execute.
- Syntax:

```
for counter in sequence:
    statement(s)
```



Mathematical Functions and Constants

- The math module is used to access mathematical functions in the Python.
- All methods of these functions are used for integer or real type objects, not for complex numbers.
- To use this module, we should import that module into our code.

```
import math
```

- **Numbers and Numeric Representation**
  - These functions are used to represent numbers in different forms.
  - Example:
    1. **ceil(x):** Return the Ceiling value. It is the smallest integer, greater or equal to the number x.
    2. **factorial(x):** Returns factorial of x. where $x \geq 0$

- **Power and Logarithmic Functions**
  - These functions are used to calculate different power related and logarithmic related tasks.
  - Example:
    1. **pow(x, y)**:Return the x to the power y value.
    2. **sqrt(x)**:Finds the square root of x

- These functions are used to calculate different trigonometric operations.
- Example:

  1.sin(x):Return the sine of x in radians

  2.cos(x):Return the cosine of x in radians

- **Constants**
  - These constants are used to put them into our calculations.

    1.Pi - Return the value of pi: 3.141592

    2.E - Return the value of natural base e. e is 0.718282

    3.inf - Returns the infinite

    4. nan - Not a number type

    - **Trigonometric & Angular Conversion Functions**

THANK YOU