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66631 Programming Essentials

OBJECTIVES

• To develop knowledge and skill on programming Basics.

• To develop knowledge and skill to create, compile, debug & execute a program.

SHORT DESCRIPTION

Basics of programming Language; Basics of Python; Variables; Data types; Strings; Operators; Decision making and Looping statements; Lists; Tuples; Functions; File operations;

DETAIL DESCRIPTION

Theory:

1. Basics of Programming
   1. State Computer Program and Programming
   2. Explain Programming Language and its classification.
   3. State Generation of Programming Languages.
   4. Describe Translator Program.
   5. Uses of Computer Programs
   6. Describe Algorithm and Flowchart.
   7. Prepare Algorithm and Flowchart for simple problems.
   8. Explain the Process of Program Planning.
2. BASICS OF PYTHON
3. Describe the History of Python.
4. Explain the features of Python.
5. Describe the Structure of Python Program
6. State Identifiers and Keywords
7. State Lines , Indentation, Multi-Line Statements and Multiple Statements on a

Single Line

1. State Quotation and Comments in Python
2. State Command Line Arguments
3. VARIABLE AND DATA TYPES
4. Assigning Values to Variables
5. State Multiple Assignment
6. Describe StandardData Types
7. Explain Data Type Conversion
8. STRINGS
9. State Accessing Values in Strings and Updating Strings
10. Uses of Escape Characters
11. Explain String Special Operators and String Formatting Operator
12. Describe Triple Quotes and Unicode String
13. Write Simple programs using strings.
14. PYTHON OPERATORS
15. State Operators and their types.
16. Describe Arithmetic Operators, Comparison Operators and Logical

Operators

1. State Assignment Operators, Bitwise Operators and Membership Operators

Identity Operators

1. Explain Operators Precedence

6. DECISION MAKING

1. Describe the conditional and unconditional branching flow.
2. Explain If Statement and If…else Statement
3. State the nested if Statement
4. Write simple program using if, if…else and nested if.

7. LOOPS

1. Describe the conditional and unconditional Looping flow.
2. State For Loop
3. State While Loop
4. Explain The Infinite Loop and Nested Loops
5. State Break ,Continue and pass Statement
6. Write simple program using for and while loop

8. LISTS

1. Define Lists and its type.
2. Assigning Values in Lists
3. Explain Updating and Deleting List Elements
4. State Basic List Operations
5. Explain Built-in List Functions and Methods
6. Write simple program using Lists.

9. TUPLES

1. Assigning Values in Tuples
2. Explain Updating and Deleting Tuple Elements
3. Describe Basic Tuples Operations
4. State No Enclosing Delimiters:
5. Explain Built-in Tuple Functions
6. Write simple program using Tuples.

10. FUNCTIONS

1. Defining a Function
2. State Calling a Function
3. Explain Passing by Reference Versus Passing by Value
4. Describe Function Arguments
5. Uses of Date and Time Functions.
6. Write simple program using functions.

11. FILES I/O

1. Printing to the Screen
2. Reading Keyboard Input
3. Uses of input Function
4. Describe Opening and Closing Files
5. Explain Reading and Writing Files

**Practical:**

**Perform skill to create, compile, debug & execute programs to solve specific problems.**

1. **Simple programs using basic structure of a programming Language (Python).**
   1. A program for printing a message.
   2. A program for adding two integer numbers.
2. **Simple programs using variables**
   1. A program to calculate the average of a set of N numbers.
   2. A program to convert the given temperature in Fahrenheit to Celsius andvice versa.
   3. A program to calculate the area of a circle.
   4. Write similar programs using variables.
3. **programs using operators** 
   1. A program to convert days to months and days.
   2. A program to calculate the area of a triangle.
   3. A program to compare two integer numbers.
   4. Write similar programs using operators.
4. **Programs using Branching Statements.**
   1. A program to select and print the largest of the three numbers.
   2. A program to compute the roots of a quadratic equation.
   3. Write similar programs using Branching Statements.
5. **Programs using Looping Statements**
   1. A program to print odd or even numbers from 1 to 100.
   2. A program to find the maximum or minimum number from a set of numbers
   3. A program for searching prime numbers.
   4. Write similar programs using Loop Statements.
6. **Programs using Lists.**
   1. A program to sort numbers in ascending or descending order using onedimensional array.
   2. A program to print numbers in two dimensional forms.
   3. Write similar programs using Lists.
7. **Programs using functions.**
   1. A program to calculate the area of a triangle using function.
   2. A program that uses a function to sort an array of integers.
   3. A program to calculate factorial of any integer using recursive function.
   4. Write similar programs using functions.
8. **Programs using files.**
   1. A program to store information to or to read information from file.
   2. Write similar programs using files.

**Reference books:**

* + - 1. Learning Python – Mark Lutz

2. Website List:

http:// python.howtocode.com.bd

http:// [www.learnpython.org](http://www.learnpython.org)

http://pythontutor.com