PYTHON FOR DATA SCIENCE ASSIGNMENT-1

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1)Which of the following variable names are INVALID in Python?

a. 1_variable
b. variable_1
c. variable1
d. variable#

Answer : - Option a. 1_variable.

2) Which of the following python sequence data type is immutable?

a. list
b. array
c. dictionary
d. tuple

Answer :- Option d. tuple

DESCRIPTIVE

Explain the concept of sequence data structures and describe any THREE fundamental operations that can be performed on sequences. For each operation, provide its time complexity and give a practical example with code implementation?

Answer :-

Sequence data structures are ordered collections of elements where each element has a specific position or index. The elements maintain their relative order, and operations can be performed based on positional access. Common examples include arrays, lists, strings, and tuples.

Three Fundamental Operations:

I.Insertion Operation:- Adding an element at a specific position in the sequence.

Time complexity : At Beginning/middle – O(n) due to shifting elements.
At end – O(1) for dynamic arrays.

```
CODE: sequence = [1,2,4,5]
      sequence.insert(2,3)
      print(sequence)
```

II. Deletion Operation:- Removing an element from a specific position in the sequence.

Time complexity : At Beginning/middle – O(n) due to shifting remaining elements.
At end – O(1) .

```
CODE: sequence = [1, 2, 3, 4, 5]
      del sequence[2]
      print(sequence)
```

III. Search Operation:- Finding the position/index of a specific element in the sequence

Time Complexity : Linear search : O(n)
Binary search : O(logn)

```
CODE : sequence = [1, 2, 3, 4, 5]
       Index = sequence.index(4)
       Print(index)
```

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2. Explain python variable naming rules and describe three basic data types with examples.

Answer :- Variable naming rules in python : variables must start with a letter (a-z, A-Z) or underscore followed by letters, numbers, or underscores. Variable names are case sensitive and cannot use python keywords.

Three Basic Data Types :

I.Integer(int) : Represents whole numbers, both positive and negative.

II.String(str): Represents text data enclosed in quotes.

III.Float(float):Represents decimal numbers.