

ASSIGNMENT : 1

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Srn: PES2UG22EC044

Multiple Choice Questions (1 Mark each)

1. What will be the output of the following code? a = 10

```
b= 5
```

```
print(a** b%3) OO 100 1 2
```

a)50

b)69

c)1

d)4

Answer: Option c

2. Given two variables, $j = 6$ and $g = 3.3$. If both normal division and floor division operators were used to divide j by g , what would be the data type of the value obtained from the operations?

- a) int, int
- b) float, float
- c) float, int
- d) int, float

Answer: Option B

Descriptive Questions (5 or 7 Marks each)

1. Discuss Python's sequence data types—strings, lists, tuples, dictionaries, sets, and range. For each type: define it, mention one key property (mutability, order, uniqueness), and give one example of its use in data manipulations. Also, briefly explain what a NumPy ndarray is and one advantage over standard lists.

Answer:

a.Strings

Definition: Immutable sequence of characters (text).

Key Property: Immutable and ordered.

Use Example: Parsing CSV rows or manipulating textual data via slicing — e.g., `s = "2025-09-04"; year= s[:4]`.

b.Lists

Definition: Mutable, ordered collection allowing duplicates.

Key Property: Mutable and indexed.

Use Example: Storing a list of data values, e.g., `values = [10, 20, 30]`, then modifying with `append()` or slicing.

c.Tuples

Definition: Immutable, ordered collection.

Key Property: Immutable and ordered.

Use Example: Returning multiple values from functions, e.g., return x, y.

d.Dictionaries

Definition: Mutable mapping of unique keys to values.

Key Property: Fast key-based lookup, unordered (in older versions, ordered since Python 3.7).

Use Example: Counting elements, e.g., freq = {'apple': 3, 'banana': 5}.

e.Sets

Definition: Mutable, unordered collection of unique elements.

Key Property: No duplicates, unordered.

Use Example: Removing duplicates from a list, e.g., unique_vals = set([1, 2, 2, 3]).

f.Range

Definition: Immutable sequence representing arithmetic progressions.

Key Property: Lazy iterable, memory-efficient.

Use Example: Iterating a loop: `for i in range(0, 10, 2): ...`

g.NumPy ndarray

Definition: N-dimensional homogeneous array provided by NumPy library.

Key Advantage: Supports vectorized operations and efficient memory usage—e.g., applying arithmetic to all elements at once: `arr * 2`.

2.Explain the basic data types in Python (int, float, complex, bool, and str). Give one example for each type and describe a situation in data science where that type is useful.

Answer:

a.int (Integer)

Whole numbers (positive, negative, zero).

Example: `a = 10`

Use in Data Science: Counting observations, indexing rows in datasets.

b.float (Floating Point)

Numbers with decimal point.

Example: `b = 3.14`

Use in Data Science: Storing measurements, probabilities, continuous values.

c.complex

Numbers with real and imaginary parts.

Example: `c = 2 + 3j`

Use in Data Science: Useful in signal processing, Fourier transforms, or advanced mathematical modeling.

d.bool (Boolean)

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Logical values: True or False.

Example: flag = True

Use in Data Science: Filtering datasets, conditional checks in models (e.g., outlier detection).

e.str (String)

Sequence of characters (text).

Example: s = "Data Science"

Use in Data Science: Handling categorical data, column names, parsing CSV/JSON files.