# ASSIGNMENT – 1

Python for Data Science
SRN: PES2UG22EC053

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**MCQ'S**

1) In Python, which of the following statements about lists is **True**?

a) Lists are immutable.
b) Lists can contain heterogeneous data types.
c) Lists cannot be nested.
d) Lists do not allow duplicate elements.
Answer: b) Lists can contain heterogeneous data types

2) Consider the following Python code:

```
import numpy as np

a = np.array([1, 2, 3])

b = np.array([4, 5, 6])

print(a + b)
```

What will be the output?
a) [5, 7, 9]
b) 15
c) [1, 2, 3, 4, 5, 6]
d) Error
Answer: a) [5, 7, 9]

**Descriptive questions**

1) Explain the difference between Python lists and NumPy arrays with an example.

Answer:
**Lists**: Can store heterogeneous data (e.g., integers, strings, floats). Operations are performed element by element using loops.
**NumPy arrays**: Store homogeneous data and allow vectorized operations, which are faster.

```
# List example
lst = [1, 2, 3]
print([x+1 for x in lst])  # [2, 3, 4]
```

```
# NumPy array example
import numpy as np
arr = np.array([1, 2, 3])
print(arr + 1)  # [2 3 4]
```

2) What are slicing operations in Python sequences? Illustrate with an example using both a string and a NumPy array.
Answer:

Slicing allows accessing a portion of a sequence using the syntax sequence[start:end:step].
code:
Example with string:

```
s = "DataScience"
print(s[0:4])   # 'Data'
print(s[::-1])  # 'ecneicSataD' (reverse)
```

Example with NumPy array:

```
import numpy as np
arr = np.array([10, 20, 30, 40, 50])
print(arr[1:4])   # [20 30 40]
print(arr[::2])   # [10 30 50]
```