# Assignment 1 - NPTEL Python for Data Science

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## MCQs (1 Mark Each)

Q1. Which of the following statements about Python is TRUE?
A) Python is statically typed
B) Python uses late binding and dynamic typing
C) Python cannot be used for data science
D) Python was developed in the U.S.
Answer: B – Python uses late binding (method lookup at runtime) and dynamic typing, which makes coding faster and more readable.

Q2. In Python, lists are:
A) Immutable and unordered
B) Mutable and ordered
C) Immutable and indexed
D) Mutable and unindexed
Answer: B – Lists in Python are mutable (values can be changed) and ordered, meaning elements maintain insertion order.

## Descriptive Questions (5–7 Marks Each)

Q3. Explain the advantages of Python for Data Science.
Answer:
Python has become a popular language for Data Science due to several advantages:
1. Open Source and Community Support – Python is free to use and has strong community-driven development.
2. Simple and Readable Syntax – Reduces coding complexity and helps beginners.
3. Extensive Libraries – Libraries like NumPy, Pandas, Matplotlib, and Scikit-learn simplify data tasks.
4. Cross-Platform Support – Works seamlessly on Windows, Linux, and Mac OS.
5. Integration with Cloud Platforms – Python integrates well with most cloud services.

Thus, Python provides speed, efficiency, and flexibility, making it an ideal tool for Data Science.

Q4. Differentiate between Lists and Tuples in Python with examples.
Answer:

Both lists and tuples are sequence data types in Python, but they differ in mutability and usage.

1. Lists:
- Ordered and mutable – values can be added, updated, or removed.
- Syntax: my_list = [1, 2, 3]
Example:
my_list = [10, 20, 30]
my_list[1] = 25   # List can be modified
print(my_list)    # Output: [10, 25, 30]

2. Tuples:
- Ordered but immutable – once created, elements cannot be changed.
- Syntax: my_tuple = (1, 2, 3)
Example:
my_tuple = (5, 6, 7)
# my_tuple[1] = 8 → ERROR (tuples cannot be modified)

Key Difference:
- Lists are used when data needs frequent modification.
- Tuples are used when data should remain constant.