AI

PART 1: Python Basics

1. What is Python? Why is it popular in AI & Data Science?
Python is a high-level programming language, popular in AI and Data Science because of its simplicity, readability, and powerful libraries like NumPy, Pandas, and TensorFlow.

2. Difference between list, tuple, set and dictionary
A list is ordered and mutable, a tuple is ordered and immutable, a set is unordered with unique elements, and a dictionary stores data in key–value pairs.

3. What are variables and data types in Python?
Variables store data values, and data types define the type of data such as int, float, string, or boolean.

4. What is the difference between == and =
= is used for assignment, while == is used for comparison.

5. Explain if, elif and else
if, elif, and else are conditional statements used to execute code based on different conditions.

6. What is a function? Why do we use functions?
A function is a reusable block of code that performs a specific task, helping improve code organization and readability.

7. Difference between for loop and while loop
A for loop iterates over a sequence, while a while loop runs as long as a condition is true.

8. What is a module? Example
A module is a file containing Python code, such as the math module.

9. What is exception handling?
Exception handling manages runtime errors using try, except, and finally blocks.

10. What is pip?
Pip is a package manager used to install and manage Python libraries.

PART 2: NumPy Basics

1. What is NumPy?
NumPy is a Python library used for numerical and mathematical operations on arrays.

2. Why is NumPy faster than Python lists?
NumPy is faster because it uses optimized C code and fixed-type elements.

3. What is an ndarray?
An ndarray is a multi-dimensional array object in NumPy.

4. Difference between array and list
A NumPy array stores homogeneous elements and supports fast computations, while a list can store mixed data types.

5. What is broadcasting?
Broadcasting allows NumPy to perform operations on arrays of different shapes.

PART 3: Pandas Basics

1. What is Pandas?
Pandas is a Python library used for data manipulation and analysis.

2. What is a DataFrame?
A DataFrame is a two-dimensional labeled data structure similar to a table.

3. Difference between Series and DataFrame
A Series is one-dimensional, while a DataFrame is two-dimensional.

4. What is CSV?
CSV stands for Comma-Separated Values, a file format for storing tabular data.

5. Why Pandas is important for AI?
Pandas is important for AI because it efficiently handles data cleaning, preprocessing, and analysis.