Python Basics

1. How do you reverse a string in Python without using slicing?

2. How do you check if a string is a palindrome in Python without using slicing?

3. What are some common list methods in Python, and how can they be used to manipulate lists?

4. What are some common methods available on Python string objects, and how can they be used to manipulate text?

5. What is the difference between a list and a tuple in Python?

6. What is the difference between a set and a dictionary in Python?

File Handling

7. How do you write data into a file in Python and then read it back?

8. What is the difference between read(), readline(), and readlines()?

9. How do you open and close a file in Python? Discuss the with statement and various file modes.

NumPy & Pandas

10. How do you create a NumPy array of zeros and reshape it?

11. How can you create a NumPy array of evenly spaced values within a given range?

12. A. Consider the dictionary:

```
data = {'Name': ['Alice', 'Bob', 'Charlie', 'David'],
        'Age': [25, 30, 35, 40],
```

```
'Salary': [50000, 60000, 70000, 80000]}
```

How can you create a dataframe from the dictionary and extract those rows where the person is above 30 years and earns more than 60000?

12. B. Create a DataFrame from a dictionary and extract rows where the salary is less than 70000.

Object-Oriented Programming (OOP)

13, What is a constructor? How do you call constructors of parent classes in inheritance?

14. What is encapsulation in Python OOP, and how can you implement it in a class?

15. What is abstraction in Python?

16. What is inheritance in Python OOP, and how is it implemented?

17. What is polymorphism in Python? Show an example.

18. What are abstract base classes (ABC) in Python and why are they useful?

19. What is multiple inheritance in Python? What are some potential issues, and how can they be resolved?

20. What is the difference between @staticmethod and @classmethod in Python?

Loops & Control Flow

21. How does the while loop work in Python? Provide an example with a break.

Data Visualization

22. How can you create a box plot using Seaborn to visualise the distribution of a numerical variable across different categories?

23. How can you visualise the relationship between two numerical variables using Seaborn?

Advanced Python / Integration

24. How to Integrate a FastAPI Backend with a Gradio Frontend