1. What is a tuple in Python, and how is it different from a list?
2. Explain the immutability property of tuples with an example.
3. How do you create an empty tuple in Python? Provide two ways.
4. Can a tuple contain mutable objects like lists or dictionaries? Justify your answer.
5. Why are tuples considered more memory-efficient than lists?
6. What happens if you try to modify an element of a tuple directly?
7. How do you create a tuple with only one element? Why is a trailing comma required?
8. What is tuple packing and unpacking in Python? Give an example.
9. Can tuples be nested? Provide an example.
10. How does Python internally differentiate between parentheses used for grouping and tuples?
11. Explain how tuples can be used as keys in a dictionary while lists cannot.
12. Describe slicing in tuples with an example.
13. What are the built-in functions that can be applied to tuples? (e.g., len, max, min, etc.)
14. How can you concatenate two tuples? Give an example.
15. Is it possible to delete a tuple element? Why or why not?
16. Can tuples contain duplicate values? Explain with an example.
17. How do the operators in and not in work with tuples?
18. Explain the difference between shallow copy and deep copy with respect to tuples containing mutable objects.
19. What are the performance advantages of using tuples over lists in Python?
20. Provide a real-life use case where tuples are preferred over lists.