

1. What is LINQ?

Answer: LINQ (Language Integrated Query) is a set of features in C# for querying data from various sources (like collections, databases, XML) using a consistent syntax.

2. What are the benefits of using LINQ?

Answer: Simplifies querying, improves readability, provides compile-time checking, and reduces the need for SQL in C# code.

3. What are the different types of LINQ?

Answer: LINQ to Objects, LINQ to SQL, LINQ to XML, LINQ to Entities, LINQ to DataSet.

4. What is the difference between IEnumerable and IQueryable?

Answer: IEnumerable executes queries in memory; IQueryable can execute queries on a remote data source like a database.

5. What is deferred execution in LINQ?

Answer: Query execution is delayed until the result is actually iterated over.

6. What is immediate execution in LINQ?

Answer: Queries are executed at the moment they are called using methods like ToList(), Count(), etc.

7. How do you filter data using LINQ?

Answer: Using the 'where' clause or the 'Where()' method.

8. What is the Select operator in LINQ?

Answer: Select is used to project data into a new form.

9. What is the difference between Select and SelectMany?

Answer: Select returns a collection of collections, while SelectMany flattens it into a single collection.

10. How do you sort data in LINQ?

Answer: Using OrderBy, OrderByDescending, ThenBy, and ThenByDescending.

11. How do you group data in LINQ?

Answer: Using the 'group by' clause or the GroupBy() method.

12. How do you join two collections in LINQ?

Answer: Using the 'join' keyword or Join() method.

13. What is a lambda expression?

Answer: A concise way to represent an anonymous method using the => operator.

14. What is anonymous type in LINQ?

Answer: A type created without explicitly defining a class using 'new { }' syntax.

15. What is the difference between First(), FirstOrDefault(), Single(), and SingleOrDefault()?

Answer: First/FirstOrDefault returns the first element; Single/SingleOrDefault expects exactly one element.

16. What is the purpose of the Any() method in LINQ?

Answer: Checks if any elements in a collection satisfy a condition.

17. What is the All() method in LINQ?

Answer: Checks if all elements in a collection satisfy a condition.

18. What is the Contains() method in LINQ?

Answer: Checks if a collection contains a specific element.

19. What is the Distinct() method in LINQ?

Answer: Removes duplicate elements from a collection.

20. What is the Aggregate() method in LINQ?

Answer: Performs a custom aggregation operation on a collection.

21. How do you count elements in LINQ?

Answer: Using the Count() method.

22. What is the Take() and Skip() method?

Answer: Take() returns the first N elements; Skip() ignores the first N elements.

23. How can you convert a LINQ result to a list or array?

Answer: Using ToList() or ToArray() methods.

24. What is the OfType<T>() method in LINQ?

Answer: Filters elements based on a specified type.

25. Can you write a LINQ query using query syntax and method syntax?

Answer: Yes, LINQ supports both query (SQL-like) and method (lambda-based) syntax.