LINQ Interview Questions and Answers

1-Explain what is LINQ? Why is it required?

Language Integrated Query or LINQ is the collection of standard query operators which provides query facilities into.NET framework language like C#, VB.NET.LINQ is required as it bridges the gap between the world of data and world of objects.

2-What are the types of LINQ?

- LINQ to Objects
- LINQ to XML
- LINQ to Dataset
- LINQ to SQL
- LINQ to Entities

3- Explain how LINQ is useful than Stored Procedures?

- **Debugging**: It is difficult to debug a stored procedure but as LINQ is part of.NET, visual studios debugger can be used to debug the queries.
- **Deployment**: For stored procedure, additional script should be provided but with LINQ everything gets compiled into single DLL hence deployment becomes easy.
- **Type Safety**: LINQ is type safe, so queries errors are type checked at compile time

4-List out the three main components of LINQ? Explain what is the extension of the file, when LINQ to SQL is used?

Three main components of LINQ are
- Standard Query Operators
- Language Extensions
- LINQ Providers

5-What is the difference between IEnumerator and IEnumerable?

IEnumerable*:* IEnumerable interface contains only a single method definition i.e. GetEnumerator () and The GetEnumerator method must return an instance of an object of a class which implements the **IEnumerator** interface.

IEnumerator*: The* **IEnumerator** interface implements two methods **MoveNext**() and **Reset**() and it also has one property called **Current** that returns the current element in the list.

6-What is the different between Select and SelectMany?

Select: Projects values that are based on a transform function.

SelectMany: Projects sequences of values that are based on a transform function and then flattens them into one sequence.

7- What is the different between First and FirstOrDefault?

First: Returns the first element of a collection, or the first element that satisfies a condition.

FirstOrDefault: Returns the first element of a collection, or the first element that satisfies a condition. Returns a default value if no such element exists.

8- What is the different between Single and SingleOrDefault?

Single: Projects values that are based on a transform function.

SingleOrDefault: Projects sequences of values that are based on a transform function and then flattens them into one sequence.

9- What are the data Sorting Operations in LINQ?

OrderBy	Sorts values in ascending order.
OrderByDescending	Sorts values in descending order.
ThenBy	Performs a secondary sort in ascending order.
ThenByDescending	Performs a secondary sort in descending order.
Reverse	Reverses the order of the elements in a collection.

10- What are the Set Operations in LINQ?

Distinct	Removes duplicate values from a collection.
Except	Returns the set difference, which means the elements of one collection that do not appear in a second collection.
Intersect	Returns the set intersection, which means elements that appear in each of two collections.
Union	Returns the set union, which means unique elements that appear in either of two collections.

11-What are the Filtering Data Operations in LINQ?

OfType	Selects values, depending on their ability to be cast to a specified type.
Where	Selects values that are based on a predicate function.

12-What are the Quantifier Operations in LINQ?

All	Determines whether all the elements in a sequence satisfy a condition.
Any	Determines whether any elements in a sequence satisfy a condition.
Contains	Determines whether a sequence contains a specified element.

13-What are the Projection Operations in LINQ?

Select	Projects values that are based on a transform function.
SelectMany	Projects sequences of values that are based on a transform function and then flattens them into one sequence.

14-What are the Partitioning Data Operations in LINQ?

Skip	Skips elements up to a specified position in a sequence.
SkipWhile	Skips elements based on a predicate function until an element does not satisfy the condition.
Take	Takes elements up to a specified position in a sequence.
TakeWhile	Takes elements based on a predicate function until an element does not satisfy the condition.

15-What are the Join Operations in LINQ?

Join	Joins two sequences based on key selector functions and extracts pairs of values.
GroupJoin	Joins two sequences based on key selector functions and groups the resulting matches for each element.

16-What are the Grouping Data Operations in LINQ?

GroupBy	Groups elements that share a common attribute. Each group is represented by an IGrouping<TKey,TElement> object.
ToLookup	Inserts elements into a Lookup<TKey,TElement>(a one-to-many dictionary) based on a key selector function.

17-What are the Generation Operations in LINQ?

DefaultIfEmpty	Replaces an empty collection with a default valued singleton collection.
Empty	Returns an empty collection.
Range	Generates a collection that contains a sequence of numbers.
Repeat	Generates a collection that contains one repeated value.

18-What are the Equality Operations in LINQ?

SequenceEqual	Determines whether two sequences are equal by comparing elements in a pair-wise manner.

19-What are the Concatenation Operations in LINQ?

Concat	Concatenates two sequences to form one sequence.

20-What are the Element Operations in LINQ?

ElementAt	Returns the element at a specified index in a collection.
ElementAtOrDefault	Returns the element at a specified index in a collection or a default value if the index is out of range.
First	Returns the first element of a collection, or the first element that satisfies a condition.

FirstOrDefault	Returns the first element of a collection, or the first element that satisfies a condition. Returns a default value if no such element exists.
Last	Returns the last element of a collection, or the last element that satisfies a condition.
LastOrDefault	Returns the last element of a collection, or the last element that satisfies a condition. Returns a default value if no such element exists.
Single	Returns the only element of a collection or the only element that satisfies a condition. Throws an InvalidOperationExceptionif there is no element or more than one element to return.
SingleOrDefault	Returns the only element of a collection or the only element that satisfies a condition. Returns a default value if there is no element to return. Throws an InvalidOperationExceptionif there is more than one element to return.

21-What are the Converting Data Types in LINQ?

AsEnumerable	Returns the input typed as IEnumerable<T>.
AsQueryable	Converts a (generic) IEnumerable to a (generic) IQueryable.
Cast	Casts the elements of a collection to a specified type.
OfType	Filters values, depending on their ability to be cast to a specified type.
ToArray	Converts a collection to an array. This method forces query execution.
ToDictionary	Puts elements into a Dictionary<TKey,TValue> based on a key selector function. This method forces query execution.
ToList	Converts a collection to a List<T>. This method forces query execution.
ToLookup	Puts elements into a Lookup<TKey,TElement> (a one-to-many dictionary) based on a key selector function. This method forces query execution.

22-What are the Aggregation Operations in LINQ?

Aggregate	Performs a custom aggregation operation on the values of a collection.
Average	Calculates the average value of a collection of values.
Count	Counts the elements in a collection, optionally only those elements that satisfy a predicate function.
LongCount	Counts the elements in a large collection, optionally only those elements that satisfy a predicate function.
Max	Determines the maximum value in a collection.
Min	Determines the minimum value in a collection.
Sum	Calculates the sum of the values in a collection.