5/4/21 Collections

Tuesday, May 4, 2021 12:05 PM

A collection is a data structure that can hold one or more items.
In C# there are two major types: generic and non-generic
All collections provide methods for adding, removing, or finding items in the collection.

Generic are Type Safe collections
Non-Generic stores everything as objects

Collections Hierarchy
- Arrays belong in the System namespace and is not included in the hierarchy
- All collections that directly or indirectly implement the Icollection interface or the Icollection<T> interface share the following features:
  - Enumerate collection
  - Copy collection contents to an array
  - Capacity and Count properties
  - A consistent lower bound
- The Ienumerable interface exposes an enumerator, which supports a simple iteration over a non-generic/generic collection
  - This allows ForEach loop, it's a read only iterator

Arrays
- A collection of objects of the same data type stored in a contiguous space in memory
- Types:
  - Single dimensional (Linear)
  - Multidimensional
  - Jagged: Array of arrays
- Note that array sizes are immutable

Non Generic Collection
- Non generic collections are used to store data when the size in unknown, This makes sure that you only take up the memory space you need
- Some common non generic collections:
  - Arraylist
  - Hashtable
  - Stack
  - Queue

Generic Collections:
- Leveraging generics you are able to have a type safe collection
- Because you're casting things to an object, you'll be able to save on overhead
- Ex:
  - List<DataType>
    - List of objects that can be accessed by index
    - An ever expanding array
  - Dictionary<T>
    - Represents a collection of key/value pairs that are organized based on the key.
  - Stack<T>
    - LIFO
  - Queue<T>
    - FIFO