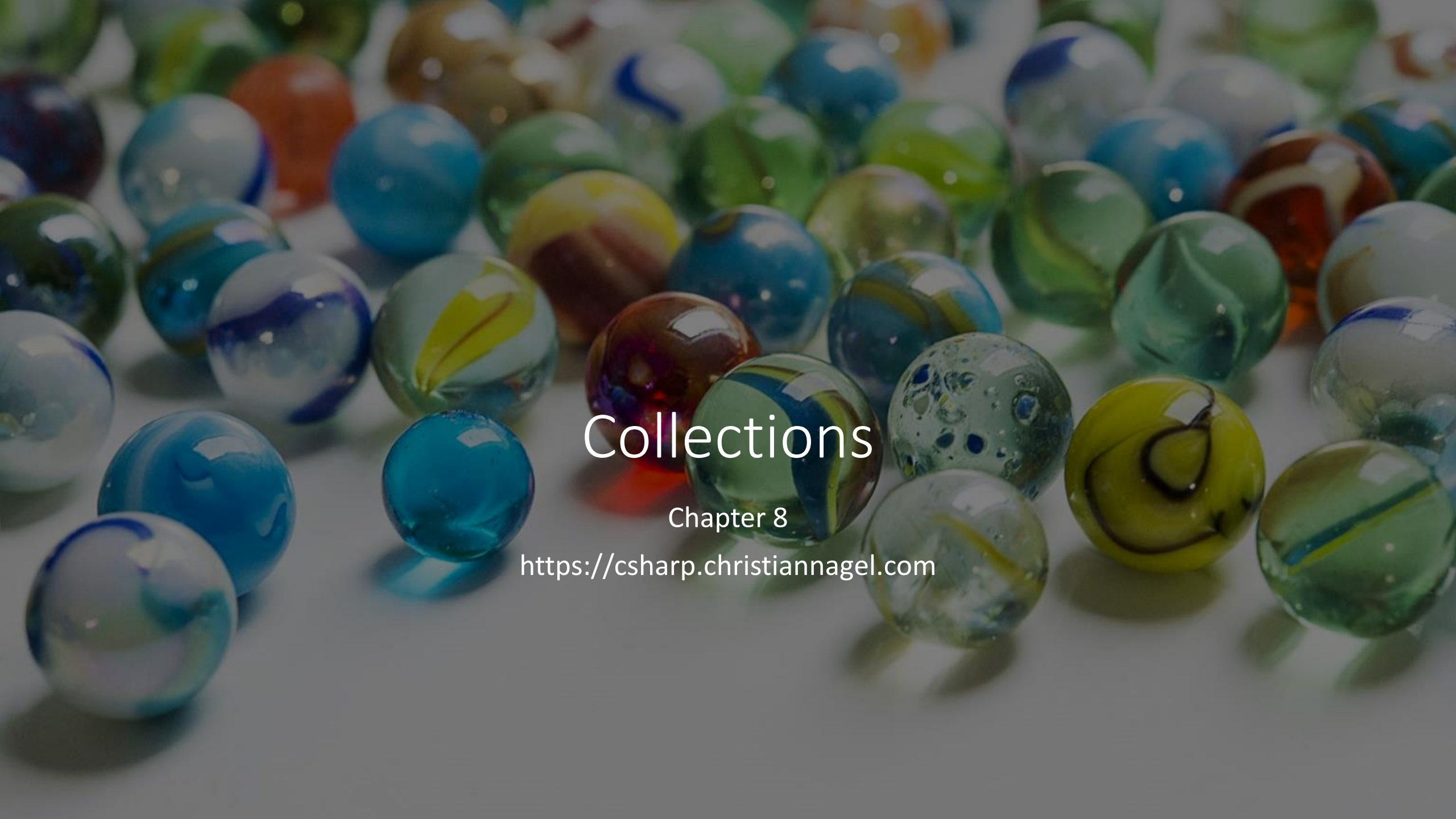

Collections

Chapter 8

https://csharp.christiannagel.com

Interfaces

Interface	Description
IEnumerable<T>	required for foreach GetEnumerator returns IEnumerator
ICollection<T>	Count, CopyTo, Add, Remove
IList<T>	Insert, RemoveAt, derives from ICollection
ISet<T>	Combine different sets into a union, intersection, overlap ISet derives from ICollection
IDictionary<TKey, TValue>	key, value
ILookup<TKey, TValue>	lookups with keys and values One key can have multiple values

Lists

- **List<T>**
- Resizable lists
- Capacity
- Read-only collection
- **ReadOnlyCollection<T>** - created from List<T> with AsReadOnly

Queue and Stack

- Queue
  - first in, first out
  - Count, Enqueue, Dequeue, Peek, TrimExcess
- Stack
  - last in, first out
  - Count, Push, Pop, Peek, Contains

Linked List

- Insert items anywhere in the list
- LinkedList<T>
- LinkedListNode<T>
  - Next, Previous

IDictionary<TKey, TValue>

- SortedList
  - less memory than SortedDictionary
- SortedDictionary
  - faster insertion, removal than SortedList
- Dictionary
  - elements not sorted

Performance (1)

Collection	Add	Insert	Remove	Item	Sort	Find
List	O(1) or O(n)	O(n)	O(n)	O(1)	O(n log n)	O(n)
Stack	Push O(1) or O(n) with resize	n/a	Pop O(1)	n/a	n/a	n/a
Queue	Enqueue O(1), O(n) with resize	n/a	Dequeue O(1)	n/a	n/a	n/a
HashSet	O(1) or O(n) with resize	Add O(1) or O(n)	O(1)	n/a	n/a	n/a
SortedSet	O(1) or O(n) with resize	Add O(1) or O(n)	O(1)	n/a	n/a	n/a

Performance (2)

Collection	Add	Insert	Remove	Item	Sort	Find
LinkedList	AddLast O(1)	AddAfter O(1)	O(1)	n/a	n/a	O(n)
Dictionary	O(1) or O(n)	n/a	O(1)	O(1)	n/a	n/a
SortedDictionary	O(log n)	n/a	O(log n)	O(log n)	n/a	n/a
SortedList	O(n) for unsorted data, O(log n) for end of list, O(n) with resize	n/a	O(n)	O(log n) to read/write	n/a	n/a

Summary

- Interfaces
- Collections
- Performance