## Problem 1. ADD(T) Complexity

var newArr = new T[this.arr.Length + 1]; - a

Array.Copy(this.arr, newArr, this.arr.Length); - n

newArr[newArr.Length - 1] = item; - b

this.arr = newArr; - n

O(f(n)) = a + n + b + n => a+b=k => 2\*n + k => O(n) – Линейна сложност.

## Problem 2. Remove(index) Complexity – Worst Case

T result = this.arr[index]; - a

var newArr = new T[this.arr.Length - 1]; - b

Array.Copy(this.arr, newArr, index); - n

Array.Copy(this.arr, index + 1, newArr, index, this.arr.Length - index - 1); - n

this.arr = newArr; - n

return result - c

O(f(n)) = a+b+n+n+n+c => a+b+c=k => 3\*n + k => O(n) – Линейна сложност

## Problem 3. Remove(index) Complexity – Best Case

T result = this.arr[index]; - a

var newArr = new T[this.arr.Length - 1]; - b

Array.Copy(this.arr, newArr, index); - c

Array.Copy(this.arr, index + 1, newArr, index, this.arr.Length - index - 1); - d

this.arr = newArr; - e

return result - f

O(f(n)) = a+b+c+d+e+f => O(1)

Имаме лист от един елемент, който искаме да махнем.

## Problem 4. Remove(index) Complexity – Average Case

Би трябвало да е някъде по средата т.е

O(f(n)) = a+b+n/2+n/2+n/2+c => a+b+c=k => (3\*n)/2 + k => O(n) – Линейна сложност

## Problem 5. RemoveFirst(T) Complexity

Same as Problem 4 Remove(index) - O(n) – Линейна сложност

## Problem 6. RemoveLast(T) Complexity

Same as Problem 4 Remove(index) - O(n) – Линейна сложност

## Problem 7. Length Complexity

O(1)

## Problem 8. This[Index] Complexity

O(1)

## Problem 9. First Complexity

O(1)

## Problem 10. First Complexity

O(1)