Deque<T> Class

**The following is a C# (.NET Framework 4.5) Implementation of a double-ended queue class which supports insertion and removal at both ends and combines the functionality of both queue and stack data structures. The class contains a private field of for its contained items of type LinkedList<T>. That being said all of the class’ methods and properties are implemented by using their respective ones from the LinkedList<T> (PopFirst() and PopLast() are a bit more complex). More about the LinkedList<T> class (System.Collections.Generics) and it’s methods and properties can be viewed here:**

<http://msdn.microsoft.com/en-us/library/he2s3bh7.aspx>

# **Constructor**

**Deque<T>() - Initializes a new instance of the Deque<T>class that is empty and has the default initial capacity.**

# **Properties**

# ****Count -**** Gets the number of elements contained in the Deque<T>.

# **Methods**

# ****PushFirst(T element) - Adds a new element at the start of the Deque{T} instance.****

# ****PushLast(T element) - Adds a new element at the end of the Deque{T instance.****

# ****PopFirst(T element) - Gets the first element of the Deque{T} and removes it from the collection.****

# ****PopLast(T element) - Gets the last element of Deque{T} and removes it from the collection.****

# ****PeekFirst() - Gets the first element of the Deque{T}.****

# ****PeekLast() - Gets the last element of the Deque{T}.****

# ****Clear() - Removes all nodes from the Deque{T}.****

# ****Contains(T element) - Determines whether a value is in the Deque{T}.****

# **Examples**

# **using System;**

# **using System.Collections.Generic;**

# **using System.Linq;**

# **using System.Text;**

# **using System.Threading.Tasks;**

# **namespace Deque**

# **{**

# **class Program**

# **{**

# **static void Main(string[] args)**

# **{**

# **// Initializing a new instance of the Deque class**

# **Deque<string> people = new Deque<string>();**

# **// Pushes a string at the start of the deque**

# **people.PushFirst("Peter");**

# **// Pushes a string at the end of the deque**

# **people.PushLast("George");**

# **people.PushFirst("Tom");**

# **people.PushLast("John");**

# **// The output result will be: 4**

# **Console.WriteLine(people.Count);**

# **string p1 = people.PeekFirst();**

# **// The output result will be: Tom**

# **Console.WriteLine(p1);**

# **string p2 = people.PopFirst();**

# **// The output result will be: Tom**

# **Console.WriteLine(p2);**

# **// The output result will be: 3**

# **Console.WriteLine(people.Count);**

# **string p3 = people.PeekLast();**

# **// The output result will be John**

# **Console.WriteLine(p3);**

# **string p4 = people.PopLast();**

# **// The output result will be: John**

# **Console.WriteLine(p4);**

# **// The output result will be: 2**

# **Console.WriteLine(people.Count);**

# **bool containsPeter = people.Contains("Peter");**

# **// The output result will be: true**

# **Console.WriteLine(containsPeter);**

# **people.Clear();**

# **// The output result will be 0**

# **Console.WriteLine(people.Count);**

# **}**

# **}**

# **}**