2025-09-10

# Lists

[Solutions for those exercises.](https:/princomp.github.io/solutions/data/lists)

## Multiple Choices

1. Put a checkmark in the box corresponding to true statements about the List abstract data type.
   * A list contains an finite collection of elements, in a particular order.
   * A list cannot contain multiple elements with the same value.
   * A list must have a fixed number of elements.
   * A list is generally endowed with an operation to test for emptiness.
   * Only the element at the beginning of a list can be removed.

## Exercises

1. Given the usual implementation of Cell and CList:

* public class CList<T>{  
   private Cell first;  
   private class Cell{  
   public T Data { get; set; }  
   public Cell Next { get; set; }  
   public Cell(T dataP, Cell nextP){Data = dataP; Next = nextP;}  
   }  
   public CList(){first = null;}  
  }
* Write…
  1. … a IsEmpty property that is true if the CList calling object is empty.
  2. … the AddF method that add a cell at the beginning of the CList (to the left).
  3. … a series of statements, to be inserted in a Main method, that a. create a CList object capable of containing char, b. insert the elements 'b' and '/' in it, c. displays whether it is empty using IsEmpty.

1. Briefly explain the purpose of the IsReadonly property from the ICollection<T> interface, and list at least two methods in a List implementation realizing ICollection<T> that should use it.
2. Explain the main differences between singly linked list and doubly linked list, and name a few methods that need to be implemented differently.
3. For what operation(s) does doubly linked list provide a complexity gain over singly linked list?