Contents

Lists

Solutions for those exercises.

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…

   (a) … a `IsEmpty` property that is **true** if the `CList` calling object is empty.

   (b) … the `AddF` method that add a cell at the beginning of the CList (to the left).

(c) … 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`.

2. 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.

3. Explain the main differences between singly linked list and doubly linked list, and name a few methods that need to be implemented differently.

4. For what operation(s) does doubly linked list provide a complexity gain over singly linked list?