

```
1 package adt;
2
3 import java.util.Comparator;
4 import java.util.Iterator;
5
6 /**
7  *
8  * @author Chew Lip Sin
9  * @author Lim Yi Leong
10  * @param <T> type of elements stored in the stack.
11  */
12 public interface ListInterface<T> {
13
14     /**
15      * Returns an iterator over the elements in the container.
16      *
17      * @param <T> type of elements stored in the List.
18      * @return An iterator over the elements in the container.
19      */
20     public Iterator<T> getIterator();
21
22     /**
23      * Adds the specified element to the end of the list.
24      *
25      * @param newEntry The element to add.
26      * @return true if the addition is successful, or false if the list is full
27      * Description: Adds a new entry to the end of the list. Entries currently
28      * in the list are unaffected. The lists size is increased by 1.
29      * Precondition: newEntry is not null. Post-condition:The entry has been
30      * added to the list.
31      */
32     public boolean add(T newEntry);
33
34     /**
35      * Adds the specified element to the list at the specified position.
36      *
37      * @param newPosition The position to add the element at.
38      * @param newEntry The element to add.
39      * @return true if the element was added successfully, false otherwise. *
40      * Description: Adds a new entry at a specified position within the list.
41      * Entries originally at and above the specified position are at the next
42      * higher position within the list. The list size is increased by 1.
43      * Precondition: newPosition >= 1 and newPosition smaller equal than
44      * getLength()+1newEntry is not null. Post-condition:newEntry is added to
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47     * the list in the given position. The old entries have been shifted up one
48     * position.
49     */
50     public boolean add(int newPosition, T newEntry);
51
52     /**
53     * Post-condition:The list is empty. Description:Removes all entries from
54     * the list.
55     */
56     public void clear();
57
58     /**
59     * Checks whether the list contains the specified element.
60     *
61     * @param newEntry The element to check for.
62     * @return true if the list contains the element, false otherwise.
63     * Description: This method finds whether the new Entry exists or not.
64     * Precondition: The array must exist. Post-condition:The array remains
65     * unchanged
66     */
67     public boolean contains(T newEntry);
68
69     /**
70     * This method is used to retrieve the entry at a given position in the
71     * list.
72     *
73     * @param givenPosition The position of the element to get.
74     * @return a reference to the indicated entry or null, if either the list is
75     * empty, givenPosition smaller 1, or givenPosition bigger getLength()
76     * Precondition:The array must exist. Post-condition:The array remains
77     * unchanged.
78     */
79     public T getEntry(int givenPosition);
80
81     /**
82     * Gets the number of entries currently in the list.
83     *
84     *
85     * @return The number of entries currently in the list. Precondition:The
86     * array must exist. Post-condition:The array remains unchanged.
87     */
88     public int size();
89
90     /**
91     * This method check if the array is empty
92     *
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93      * @return true if the list is empty, false otherwise. * Post-condition:The
94      * array remains unchanged.
95      *
96      */
97      public boolean isEmpty();
98
99      /**
100     * Removes the element at the specified position in the list.
101     *
102     * @param givenPosition The position of the element to remove.
103     * @return The element that was removed, or null if the position is invalid.
104     */
105     public T remove(int givenPosition);
106
107     /**
108     * Removes all occurrences of the specified elements from the list.
109     *
110     * @param elements The elements to be removed.
111     * @return {@code true} if removal is successful, {@code false} if the list
112     * is empty or elements are invalid.
113     */
114     public boolean removeAll(T... elements);
115
116     /**
117     * Adds all of the elements in the specified array to the end of the list.
118     *
119     * @param newElements The array of elements to add.
120     * @return true if all of the elements were added successfully, false
121     * otherwise. Precondition:newElements must not be null. Post-condition:
122     */
123     public boolean addAll(T... newElements);
124
125     /**
126     * Removes the first occurrence of the specified entry from the list.
127     *
128     * @param anEntry The entry to be removed.
129     * @return {@code true} if removal is successful, {@code false} if the entry
130     * is not found.
131     */
132     public boolean remove(T anEntry);
133
134     /**
135     * Replaces the entry at the specified position with the new entry.
136     *
137     * @param givenPosition The position of the entry to be replaced.
138     * @param newEntry The new entry to replace the existing entry.
```

```
139     * @return {@code true} if replacement is successful, {@code false} if the
140     * list is empty, or position is invalid.
141     */
142     public boolean replace(int givenPosition, T newEntry);
143
144     /**
145     * Checks if the array is full.
146     *
147     * @return {@code true} if the array is full, {@code false} otherwise.
148     */
149     public boolean isFull();
150
151     public <T extends Comparable<T>> void bubbleSort();
152
153 }
```