Practical IB Computer Science Test

Name: _____ Date: 29/03/2023

Arrays

Write a Java Class to manipulate an unordered array of Strings according to the instructions below.

The expected output is shown on next page, and by running the main method of the code attached to the learning portal.

Work through the test from the beginning. Your program should build and grow ----- ***do not*** start a new program for each point. During this test, you may use any resources that you have created, but you may **not** use Internet.

Instructions
1. Write a ***printWholeArray*** method to output all indices and their the contents in the array and its length
2. Write a ***printArray*** method to output the (populated) contents of the array and its population
3. Write the ***isFull*** and ***isEmpty*** methods to check for the respective status of the array
4. Write an ***add*** method that places a new string in the next available index in the array. Check for a full array first.
5. Write a ***search*** method that returns the *index* of a string in an array or -1 if the string is not found
6. Write a ***clone*** method that returns a copy of another array
7. Write a ***remove*** method that finds and deletes a string inside the array
8. Write a ***swap*** method that finds and deletes a string inside the array
9. Write a ***replace*** method that finds one string and replaces it with another
10. Write an ***insert*** method that makes room for a new string inside replaces it with another string, placing the original string in the next available index in the array

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Expected output:

1. printWholeArray + length:
   Expected output >>> 0:null 1:null 2:null 3:null 4:null 5:null 6:null 7:null 8:null 9:null [length: 10]
   Y O U R output >>> 0:null 1:null 2:null 3:null 4:null 5:null 6:null 7:null 8:null 9:null [length: 10]

2. printArray + population:
   Expected output >>> [population: 0]
   Y O U R output >>> [population: 0]

3. Testing isFull() method [false] >>> false
   Testing isEmpty() method [true] >>> true

4. Testing the add() method...
   Output should be: Error adding longan >>> Error adding longan
   Expected output >>> 0:apple 1:banana 2:cherry 3:dragonfruit 4:elderberry 5:fig 6:gooseberry 7:imbe 8:jujube 9:kiwi [population: 10]
   Y O U R output >>> 0:apple 1:banana 2:cherry 3:dragonfruit 4:elderberry 5:fig 6:gooseberry 7:imbe 8:jujube 9:kiwi [population: 10]

5. Test search(arr, "banana") method [1]: 1
   Test search(arr, "grape") method [-1]: -1

6. Testing clone method String[] full = clone(arr); [false]: false

7. Testing remove(arr, "dragonfruit"); remove(arr, "gooseberry"); - output should be as below:
   Testing remove(arr, "watermelon") should output error: watermelon not found >>> watermelon not found.

8. Testing swap(arr, 0, 5);
   Testing swap(arr, 3, 10); swap(arr, -3, 1); this should generate two errors >>>
   Error in index value(s)
   Error in index value(s)
   Expected output >>> 0:fig 1:banana 2:cherry 4:elderberry 5:apple 7:imbe 8:jujube 9:kiwi [population: 8] (printArray)
   Y O U R output >>> 0:fig 1:banana 2:cherry 4:elderberry 5:apple 7:imbe 8:jujube 9:kiwi [population: 8]

9. Testing replace(arr, "apple", "papaya")
   Expected output >>> 0:fig 1:banana 2:cherry 3:null 4:elderberry 5:papaya 6:null 7:imbe 8:jujube 9:kiwi [length: 10] (printWholeArray)
   Y O U R output >>> 0:fig 1:banana 2:cherry 3:null 4:elderberry 5:papaya 6:null 7:imbe 8:jujube 9:kiwi [length: 10]
   Testing replace(arr, "watermelon", "apple") should output error: watermelon not found >>> watermelon not found.

10. Testing insert(arr, "plum", 0)
    Expected output >>> 0:plum 1:banana 2:cherry 3:fig 4:elderberry 5:papaya 6:null 7:imbe 8:jujube 9:kiwi [length: 10] (printWholeArray)
    Y O U R output >>> 0:plum 1:banana 2:cherry 3:fig 4:elderberry 5:papaya 6:null 7:imbe 8:jujube 9:kiwi [length: 10]
    Testing insert(arr, "mango", 11) should output an error >>> Error in index value(s)