Homework 02 : Stack

You **MUST NOT** modify any existing codes in all given templates unless the instruction allows you to do so.

You are given interface MyStack.

1. (3 marks) Class StackArray and StackLinkedList are given, along with other classes necessary for them. However, their implementations do not include method **size()** defined in interface MyStack. Please write the code for **size()** for both classes. Test cases for method **size()** can be run from class StackArrayTest and StackLinkedListTest (0.5 marks for each test).

2. Class MyBasket is a class that uses a stack in its working (its variable is of type MyStack).
   Write code for the methods in class MyBasket:

   A) (5 marks) **public void removeKthFromTop(int k)**. This method removes the kth data (the top of stack is the 0^{th} data).
   - If the stack is empty, or the value of k does not indicate a possible position in the stack, this method does nothing.
   - You are allowed to use additional stacks to help, but you are not allowed to create other data structures such as arrays or lists.
   - You are allowed to create primitive variables.
   - Operations on stacks must only be operations defined in interface MyStack.
   - Use class MyBasketTest to test your code. (1 mark for each case)

As an example, if **removeKthFromTop(2)** is called on

10
20
30
40
50

Then the resulting stack is

10
20
40
50

   B) (5 marks) **public void insertKthFromTop(int data, int k)**. This method adds a new data at the kth position (the top of stack is at the 0^{th} position).
   - If the stack is empty and k is 0, then add data as the first data in the stack.
   - If k does not indicate a possible position then this method does nothing.
   - You are allowed to use additional stacks to help, but you are not allowed to create other data structures such as arrays or lists.
   - You are allowed to create primitive variables.
   - Operations on stacks must only be operations defined in interface MyStack.
   - Use class MyBasketTest to test your code. (1 mark for each case)

As an example, if **insertKthFromTop(66,3)** is called on

10
20
30
40
50

Then the resulting stack is

10
20
30
66
40
50

Another example, if **insertKthFromTop(66,0)** is called on

10
20
30
40
50

Then the resulting stack is

66
10
20
30
40
50

How to submit:

Submit StackArray.java, StackLinkedList.java, MyBasket.java (zip them all together) to MyCourseville assignment page.