# 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).

1. 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:

1. (5 marks) **public void removeKthFromTop(int k)***.* This method removes the kth data (the top of stack is the 0th 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 |

1. (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 0th 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.