

CS 46A Fall 2022

Homework 09

Requirements

1. You must name your classes exactly as specified. Otherwise Codecheck will not be able to process your submission and you will get no credit.
2. When you are finished with your code, submit it to Codecheck one final time then download the .signed.zip file.
3. You must upload all three signed.zip files together to Canvas and you should double check the files in Canvas to make sure all three zip files are uploaded.
4. Do not open the downloaded zip files. The files are digitally signed, and the grader program will check that they have not been opened.
5. Due time: 10 pm, Saturday, Nov 05. Submissions before the due time are not late.

You will lose five points if your submission is marked Late in Canvas.

6. Grace time: 10 am, Sunday, Nov 06. Submissions before the grace time will not be rejected.
7. You will receive no points if your submission is rejected by Canvas.

Remember to follow our Programming Style Requirements!

Problem A

Create a BlueJ project with three classes, **Stock**, **StockArray**, and **StockArrayTester**. Copy **Stock** and **StockArrayTester** from Codecheck and do not change them in any way. You will write the entire class **StockArray**.

The **StockArray** class manages Stock objects but uses an array instead of an array list as in Problem C of Hw08. The class has two instance variables, an array of **Stock** and an int numOfStocks for the number of stocks in the array. The class has one constructor with one int parameter for the length of the array, and the constructor will set numOfStocks to zero. Note that the array length is not the number of stocks in the array.

The class has the following methods:

- **public void insert(Stock stock, int index)** Adds the stock at the specified index position and maintain the order of all elements in the array and updates numOfStocks if the array is not full and the index is valid. Otherwise, the method does nothing.
- **public void swap(int index1, int index2)** Swaps the stock at index1 with the stock at index2. If either index is out of bounds, does not change anything.

- **public double quote(String symbol)** Gets the price for the stock in the array specified by the parameter symbol. If the stock is not in the array, returns -1.
- **public String toString()** Returns a string containing all stocks in the array in the format [Stock[...], Stock[...], . . . Stock[...]], where each item Stock[...] is the string from the toString() method of class Stock for a stock in the array.

Use only one temporary variable for the swap() method.

Do not go out of the range of the elements [0, numOfStocks – 1].

Do not copy the array.

[Codecheck link for problem A](#)

Problem B

Create a BlueJ project with two classes, **IntArray** and **IntArrayTester**. Copy the tester program from Codecheck and do not change it in any way. You will write the entire class **IntArray**.

The class has two instance variables, an int array and the count of values in the array. Note that the count of values is not the same as the array length, and you must make sure it is correct at all times.

The class has one constructor that takes two parameters to initialize the two instance variables.

The **class** has these methods:

- **public void add(int value)** Adds value to the end of the array if the array is not full and does nothing otherwise.
- **public void remove(int index)** Removes the value at the specified index position from the array and shifts any subsequent elements to the left (subtracts one from their indices) if the index is valid. The method does nothing if the index is invalid.
- **public int countOutOfRange(int low, int high)** Gets the count of the array elements that are not in the specified range [low, high].
- **public int lastNegative ()** Returns the last negative value in the array and 0 if no negative values in the array.
- **public String toString ()** Returns a string listing all values in the array separated by a comma and a space and enclosed in a pair of "[" and "]". For example, [3, 56, 23, -2].

Do not go out of the range of the elements.

[Codecheck link for problem B](#)

Problem C

Weather.com maintains tables of the average high temperatures by year for various locations. The table for 3 years for San Jose might look like this

	2017	2010	2000
Jan	58	59	40
Feb	62	60	45
Mar	66	65	65
Apr	70	72	68
May	75	73	72
Jun	80	81	83
Jul	83	84	90
Aug	82	82	87
Sept	81	80	81
Oct	74	75	71
Nov	65	66	68
Dec	58	56	59

For the South Pole, since the temperatures do not vary much, they only record 3 values per year

	2017	2010	2000
Nov – Feb	-17	-16	-15
Mar – Jun	-58	-60	-63
Jul – Oct	-65	-74	-80

Write a Java class **TemperatureTable** to manage a 2-D array of integers representing these temperature tables.

The class has one constructor that takes one parameter of a 2-D array of integers. You can assume the 2-D array is neither empty nor partial.

The class has the following methods.

- **public double columnAverage(int colIndex)** Gets the average of the specified column.
- **public int rowMax(int rowIndex)** Gets the largest value of the specified row.
- **public int largerValueInMaxRowMinColumn(int limit)** Gets the value that is larger than the specified limit, has the max row index among all values larger than the specified limit, and has the smallest column index among all such values in the row. Returns the limit if no values in the 2-D array is larger than the limit.

[Codecheck link for problem C](#)