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Data Structures & Algorithms: Assignment - Array Sorting and Hashmaps

```
package project;
import java.util.Scanner;
import java.util.TreeMap;
import java.util.HashMap;
import java.util.Map;
import java.util.Arrays;

public class main {
	public static void main(String[] args) {
		//1. print programming specifications
		System.out.println("Current JVM version - " + Runtime. version());

		//initialize keyboard input
		Scanner keyboard = new Scanner(System.in);

		//store the 50 states and their capitals are stored in a two-dimensional array in order by state name
		String[][] statesAndCaps = {
				{"alabama", "alaska", "arizona",
				"arkansas", "california", "colorado", "connecticut", "delaware",
				"florida", "georgia", "hawaii",
				"idaho", "illinois", "indiana", "iowa", "kansas", "kentucky",
				"louisiana", "maine", "maryland", "massachusetts", "michigan",
				"minnesota", "mississippi", "missouri",
				"montana", "nebraska", "nevada", "new hampshire", "new jersey",
				"new mexico", "new york", "north carolina", "north dakota",
				"ohio", "oklahoma", "oregon",
				"pennsylvania", "rhode island", "south carolina",
				"south dakota", "tennessee", "texas", "utah",
				"vermont", "virginia", "washington", "west virginia", "wisconsin",
				"wyoming"},
				{"montgomery", "juneau", "phoenix", "little rock", "sacramento", "denver",
				"hartford", "dover", "tallahassee", "atlanta", "honolulu", "boise",
				"springfield", "indianapolis", "des moines", "topeka", "frankfort",
				"baton rouge", "augusta", "annapolis", "boston", "lansing", "saint paul",
				"jackson", "jefferson city", "helena", "lincoln", "carson city", "concord",
				"trenton", "santa fe", "albany", "raleigh", "bismarck", "colombus",
				"oklahoma city", "salem", "harrisburg", "providence", "columbia", "pierre",
				"nashville", "austin", "salt lake city", "montpelier", "richmond", "olympia",
				"charleston", "madison", "cheyenne"}
		};

		// initialize other variable
		int count = 0;
		HashMap capsMap = new HashMap();
		TreeMap sortedCapsMap = new TreeMap();

		// display contents of array
		System.out.println("Sorted by state");
		for (int i=0; i<50; i++) {
			System.out.println(statesAndCaps[1][i]+", "+statesAndCaps[0][i]);
```

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                }

                // use a bubble sort to sort the content by capital
                for (int i = 0; i < 50-1; i++) {
                   for (int j = 0; j < 50-i-1; j++) {
                        if(statesAndCaps[1][j].compareTo(statesAndCaps[1][j+1]) > 0) {

                                String tempCap = statesAndCaps[1][j];
                                String tempState = statesAndCaps[0][j];

                                statesAndCaps[1][j] = statesAndCaps[1][j+1];
                           statesAndCaps[0][j] = statesAndCaps[0][j+1];

                           statesAndCaps[1][j+1] = tempCap;
                           statesAndCaps[0][j+1] = tempState;
                        }
                   }
                }

                // prompt the user to enter answers for all the state capitals
                for (int i=0; i<50; i++) {
                        System.out.println("What is the capital of " +statesAndCaps[0][i]);
                        String capital = keyboard.nextLine().toLowerCase();
                        if (capital.compareTo(statesAndCaps[1][i]) == 0) {
                                count += 1;
                                continue;
                        } else {
                                continue;
                        }
                }

                // display the total correct count
                System.out.println("Score = " + count);

                // store the pairs of each state and its capital in a Map using the HashMap function
                for (int i=0; i<50; i++) {
                        capsMap.put(statesAndCaps[0][i], statesAndCaps[1][i]);
                }
                // Display the content of the Map
                System.out.println(capsMap);

                // use the TreeMap class to sort the map while using a binary search tree for storage
                sortedCapsMap.putAll(capsMap);

                // prompt the user to enter a state and it should then display the capital for the state
                System.out.println("Enter a state to find the capital");
                String state = keyboard.nextLine().toLowerCase();
                System.out.println("The capital of " +state+ " is " +sortedCapsMap.get(state));
        }
}
```