

Code for Part 1 of Assignment Array

```
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        // Array of states and capitals
        String[][] statesAndCapitals = {
            {"Alabama", "Montgomery"},
            {"Alaska", "Juneau"},
            {"Arizona", "Phoenix"},
            {"Arkansas", "Little Rock"},
            {"California", "Sacramento"},
            {"Colorado", "Denver"},
            {"Connecticut", "Hartford"},
            {"Delaware", "Dover"},
            {"Florida", "Tallahassee"},
            {"Georgia", "Atlanta"},
            {"Hawaii", "Honolulu"},
            {"Idaho", "Boise"},
            {"Illinois", "Springfield"},
            {"Indiana", "Indianapolis"},
            {"Iowa", "Des Moines"},
            {"Kansas", "Topeka"},
            {"Kentucky", "Frankfort"},
            {"Louisiana", "Baton Rouge"},
            {"Maine", "Augusta"},
            {"Maryland", "Annapolis"},
            {"Massachusetts", "Boston"},
            {"Michigan", "Lansing"},
            {"Minnesota", "Saint Paul"},
            {"Mississippi", "Jackson"},
            {"Missouri", "Jefferson City"},
            {"Montana", "Helena"},
            {"Nebraska", "Lincoln"},
            {"Nevada", "Carson City"},
            {"New Hampshire", "Concord"},
            {"New Jersey", "Trenton"},
            {"New Mexico", "Santa Fe"},
            {"New York", "Albany"},
            {"North Carolina", "Raleigh"},
            {"North Dakota", "Bismarck"},
        }
```

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        {"Ohio", "Columbus"},
        {"Oklahoma", "Oklahoma City"},
        {"Oregon", "Salem"},
        {"Pennsylvania", "Harrisburg"},
        {"Rhode Island", "Providence"},
        {"South Carolina", "Columbia"},
        {"South Dakota", "Pierre"},
        {"Tennessee", "Nashville"},
        {"Texas", "Austin"},
        {"Utah", "Salt Lake City"},
        {"Vermont", "Montpelier"},
        {"Virginia", "Richmond"},
        {"Washington", "Olympia"},
        {"West Virginia", "Charleston"},
        {"Wisconsin", "Madison"},
        {"Wyoming", "Cheyenne"}
    };

    // Display the contents of the array
    System.out.println("Current contents of the array:");
    for (int i = 0; i < statesAndCapitals.length; i++) {
        System.out.println(statesAndCapitals[i][0] + " - " + statesAndCapitals[i][1]);
    }

    // Use bubble sort to sort the array by the state capital
    for (int i = 0; i < statesAndCapitals.length; i++) {
        for (int j = 0; j < statesAndCapitals.length - 1 - i; j++) {
            if (statesAndCapitals[j][1].compareTo(statesAndCapitals[j+1][1]) > 0) {
                // Swap the elements
                String[] temp = statesAndCapitals[j];
                statesAndCapitals[j] = statesAndCapitals[j+1];
                statesAndCapitals[j+1] = temp;
            }
        }
    }

    // Print the sorted contents of the array
    System.out.println("Sorted contents of the array:");
    for (int i = 0; i < statesAndCapitals.length; i++) {
        System.out.println(statesAndCapitals[i][0] + " - " + statesAndCapitals[i][1]);
    }

    // Prompt the user to enter answers for every capital
    Scanner scanner = new Scanner(System.in);
    int correctCount = 0;
    for (int i = 0; i < statesAndCapitals.length; i++) {
        System.out.print("What is the capital of " + statesAndCapitals[i][0] + "? ");
        //Remove case sensitivity
        String userAnswer = scanner.nextLine().trim().toLowerCase();
    }

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        if (userAnswer.equals(statesAndCapitals[i][1].toLowerCase())) {
            System.out.println("Correct!");
            correctCount++;
        } else {
            System.out.println("Incorrect. The capital of " + statesAndCapitals[i][0] + " is " +
statesAndCapitals[i][1] + ".");
        }
    }
}

// Display how many the user got right out of the total
System.out.println("You got " + correctCount + " out of " + statesAndCapitals.length + " states right!");
}
}

```

Code for Part 2 of Assignment Hashmap

```

import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;
import java.util.TreeMap;

public class Main {
    public static void main(String[] args) {
        // Map of states and capitals
        Map<String, String> statesAndCapitals = new HashMap<>();
        statesAndCapitals.put("alabama", "montgomery");
        statesAndCapitals.put("alaska", "juneau");
        statesAndCapitals.put("arizona", "phoenix");
        statesAndCapitals.put("arkansas", "little rock");
        statesAndCapitals.put("california", "sacramento");
        statesAndCapitals.put("colorado", "denver");
        statesAndCapitals.put("connecticut", "hartford");
        statesAndCapitals.put("delaware", "dover");
        statesAndCapitals.put("florida", "tallahassee");
        statesAndCapitals.put("georgia", "atlanta");
        statesAndCapitals.put("hawaii", "honolulu");
        statesAndCapitals.put("idaho", "boise");
        statesAndCapitals.put("illinois", "springfield");
        statesAndCapitals.put("indiana", "indianapolis");
        statesAndCapitals.put("iowa", "des moines");
        statesAndCapitals.put("kansas", "topeka");
        statesAndCapitals.put("kentucky", "frankfort");
        statesAndCapitals.put("louisiana", "baton rouge");
    }
}

```

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statesAndCapitals.put("maine", "augusta");
statesAndCapitals.put("maryland", "annapolis");
statesAndCapitals.put("massachusetts", "boston");
statesAndCapitals.put("michigan", "lansing");
statesAndCapitals.put("minnesota", "st. paul");
statesAndCapitals.put("mississippi", "jackson");
statesAndCapitals.put("missouri", "jefferson city");
statesAndCapitals.put("montana", "helena");
statesAndCapitals.put("nebraska", "lincoln");
statesAndCapitals.put("nevada", "carson city");
statesAndCapitals.put("new hampshire", "concord");
statesAndCapitals.put("new jersey", "trenton");
statesAndCapitals.put("new mexico", "santa fe");
statesAndCapitals.put("new york", "albany");
statesAndCapitals.put("north carolina", "raleigh");
statesAndCapitals.put("north dakota", "bismarck");
statesAndCapitals.put("ohio", "columbus");
statesAndCapitals.put("oklahoma", "oklahoma city");
statesAndCapitals.put("oregon", "selem");
statesAndCapitals.put("pennsylvania", "harrisburg");
statesAndCapitals.put("rhode island", "providence");
statesAndCapitals.put("south carolina", "columbia");
statesAndCapitals.put("south dakota", "pierre");
statesAndCapitals.put("tennessee", "nashville");
statesAndCapitals.put("texas", "austin");
statesAndCapitals.put("utah", "salt lake city");
statesAndCapitals.put("vermont", "montpelier");
statesAndCapitals.put("virginia", "richmond");
statesAndCapitals.put("washington", "olympia");
statesAndCapitals.put("west virginia", "charleston");

```

// Display the contents of the map

```

System.out.println("Current contents of the map:");
for (Map.Entry<String, String> entry : statesAndCapitals.entrySet()) {
    System.out.println(entry.getKey() + " - " + entry.getValue());
}

```

// Use a TreeMap to sort the map

```

Map<String, String> sortedStatesAndCapitals = new TreeMap<>(statesAndCapitals);

```

// Display the states and caps in the map

```

System.out.println("Sorted contents of the map:");
for (Map.Entry<String, String> entry : sortedStatesAndCapitals.entrySet()) {
    System.out.println(entry.getKey() + " - " + entry.getValue());
}

```

// Prompt the user to enter a state and convert to lowercase to remove case sensitivity

```

Scanner scanner = new Scanner(System.in);
System.out.print("Enter a state: ");

```

```
String userState = scanner.nextLine().trim().toLowerCase();

// Return the answer as Capital of ____ is ____
String capital = sortedStatesAndCapitals.get(userState);
if (capital == null) {
    System.out.println("Invalid state");
} else {
    System.out.println("Capital of " + userState + " is " + capital);
}
}
}
```