**Part 1**

```java
import java.util.Scanner;

public class Main {

  public static void main(String[] args) {
    // Array containing the states and capitals
    String[][] statesAndCapitals = {
      // State and capital pairs
      { "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", "St. 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" },
```

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      { "North Carolina", "Raleigh" },
      { "North Dakota", "Bismarck" },
      { "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 current contents of the array
    System.out.println("Current contents of the array:");
    displayArray(statesAndCapitals);

    // Sort the array by capital using bubble sort
    bubbleSort(statesAndCapitals);

    // Display the sorted array
    System.out.println("\nArray after sorting by capital:");
    displayArray(statesAndCapitals);

    // Prompt the user to enter answers for state capitals
    Scanner scanner = new Scanner(System.in);
    int correctCount = 0;
    for (int i = 0; i < statesAndCapitals.length; i++) {
      // Get the state and capital for the current iteration
      String state = statesAndCapitals[i][0];
      String capital = statesAndCapitals[i][1];

      // Prompt the user to enter the capital of the state
      System.out.print("Enter the capital of " + state + ": ");
      String userCapital = scanner.nextLine();

      // Check if the user's answer is correct (case-insensitive)
```

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      if (userCapital.equalsIgnoreCase(capital)) {
        correctCount++;
      }
    }

    // Display the total correct count
    System.out.println("\nTotal correct count: " + correctCount);

    // Close the scanner
    scanner.close();
  }

  // Method to display the contents of the array
  private static void displayArray(String[][] array) {
    // Iterate over the array and print each state and capital pair
    for (String[] row : array) {
      System.out.println(row[0] + " - " + row[1]);
    }
  }

  // Method to sort the array using bubble sort based on capital
  private static void bubbleSort(String[][] array) {
    int n = array.length;
    for (int i = 0; i < n - 1; i++) {
      for (int j = 0; j < n - i - 1; j++) {
        // Compare the capitals of adjacent elements
        if (array[j][1].compareToIgnoreCase(array[j + 1][1]) > 0) {
          // Swap elements if the current capital is greater than the next capital
          String[] temp = array[j];
          array[j] = array[j + 1];
          array[j + 1] = temp;
        }
      }
    }
  }
}
```

**Part 2.**

```java
/* ******** My additions: ********
    - User's entry is not case sensitive
    - Prompt the user to enter a state until "exit" is entered
 */

import java.util.*;

public class Main {

  public static void main(String[] args) {
    // Create a HashMap to store the case-insensitive state names and their capital pairs
    HashMap<CaseInsensitiveString, String> stateCapitalMap = new HashMap<>();

    // Array containing the states and capitals
    String[][] statesAndCapitals = {
      // State and capital pairs
      { "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" },
```

```java
    { "Minnesota", "St. 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" },
    { "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" },
};

// Add the case-insensitive state-capital pairs to the HashMap
for (String[] pair : statesAndCapitals) {
  // Extract the state and capital from the pair
  String state = pair[0];
  String capital = pair[1];

  // Create a CaseInsensitiveString object as the key
  CaseInsensitiveString key = new CaseInsensitiveString(state);

  // Add the state-capital pair to the HashMap
  stateCapitalMap.put(key, capital);
}

// Display the sorted Map
```

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      System.out.println("\nSorted Map:");
      displayMap(stateCapitalMap);

      // Prompt the user to enter a state until "exit" is entered
      Scanner scanner = new Scanner(System.in);
      while (true) {
        System.out.print("\nEnter a state (type 'exit' to exit): ");
        String userInput = scanner.nextLine().trim();

        // Check if the user wants to exit
        if (userInput.equalsIgnoreCase("exit")) {
          break;
        }

        // Create a CaseInsensitiveString object from the user's input
        CaseInsensitiveString userKey = new CaseInsensitiveString(userInput);

        // Check if the state exists in the Map
        if (stateCapitalMap.containsKey(userKey)) {
          // Retrieve the capital for the given state
          String capital = stateCapitalMap.get(userKey);

          // Display the capital of the state
          System.out.println("Capital of " + userKey.getValue() + ": " + capital);
        } else {
          System.out.println("Capital not found for " + userInput);
        }
      }

      // Close the scanner
      scanner.close();
    }

    // Method to display the content of the Map
    private static void displayMap(Map<CaseInsensitiveString, String> map) {
      for (Map.Entry<CaseInsensitiveString, String> entry : map.entrySet()) {
        // Retrieve the state and capital from the Map entry
        CaseInsensitiveString state = entry.getKey();
        String capital = entry.getValue();

        // Display the state-capital pair
        System.out.println(state.getValue() + " - " + capital);
      }
    }
```

```java
// Custom class to represent a case-insensitive string
static class CaseInsensitiveString {

  private final String value;

  // Constructor to initialize the value
  public CaseInsensitiveString(String value) {
    this.value = value;
  }

  // Getter method to retrieve the value
  public String getValue() {
    return value;
  }

  // Override the equals() method for case-insensitive comparison
  @Override
  public boolean equals(Object obj) {
    // Check if the references are the same
    if (this == obj) {
      return true;
    }

    // Check if the object is null or of different class
    if (obj == null || getClass() != obj.getClass()) {
      return false;
    }

    // Perform case-insensitive comparison
    CaseInsensitiveString other = (CaseInsensitiveString) obj;
    return value.equalsIgnoreCase(other.value);
  }

  // Override the hashCode() method for consistent hashing
  @Override
  public int hashCode() {
    // Convert the value to lowercase and calculate the hash code
    return value.toLowerCase().hashCode();
  }
}
}
```