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Assignment 3

Due: Monday 3/14/2022 11:59pm

Contents

Program

This program will give you practice with Java Swing and the Map ADT (specifically with `HashMap` data structure). You will write a small GUI program that shows the unemployment rate (as of January 2021) of each state in the United States. The rates have been provided in a .csv file. You will read the data in to custom class objects and then insert into a Map each state's abbreviation and the state object itself. The user can then search for states by abbreviation to find that state's unemployment rate. The search process must utilize a `java.util.HashMap`. See the Example Output.

Here is the link to the GitHub Classroom assignment:
https://classroom.github.com/a/_r68a1S4

(a) Setup a Java Swing GUI

Use the lecture code examples to help you setup a simple GUI interface with at least a `JTextField`, `JButton`, and some `JLabel`s. You can add more the GUI if you wish. You can use any layout you wish.

Your class must implement the `ActionListener` interface. The `JButton` throws an `ActionEvent` when pressed, and the `JTextField` throws an `ActionEvent` when the user presses the Enter key while typing. You program must support both of these events.

(b) Create a class for state data

Create a class that will hold a single state's data. The class should have at least 3 member variables for the: abbreviation (`String`), state full name (`String`), and unemployment rate (`float`). We named our class `State`, but you can name it whatever you want.

(c) Load the data

Load the .csv data file provided. If you need help loading a .csv text file, see this tutorial. For each line of the .csv file (e.g. each state), you will allocate an instance of your custom state class and fill it with that line's data. You will also add that state instance to a `Map` where the (key, value) pair is (state abbrev., state instance). For example, if the first line of the data file is "`AL,Alabama,3.9`", you would allocate a state instance, set it's abbreviation to `AL`, set it's name to `Alabama`, and set it's unemployment to `3.9`. Then you would add this state object to your `Map`. At the end of loading the data file, you should have allocated 50 state instances and added them to a `Map` so they can be looked up with state abbreviations as keys.

(d) Handle the search

When the user presses the button or presses Enter in the textfield, your program should get the state instance from the `Map` and display information about that state somehow (likely a `JLabel`), including the state's full name and unemployment rate.

Your program search must meet to the following requirements:

- Must handle case-insensitive search (upper or lowercase or mixed)

- Shows an error message if incorrect key is used

- Both button and textfield searches are possible

- Must retrieve the state object from a `Map` given state abbreviation

Submission

You will commit and push your changes to your specific GitHub Classroom repository for this assignment. You are encouraged to use an IDE for development, but we will compile and run your program using the shell/terminal during grading, so it isn't a bad idea to test it in that environment to make sure it works. Please follow the directions in this assignment, make the requested code changes, and commit and push your changes any time before the due date. Please see the advice below; it is important for grading purposes. **Failure to follow these directions will result in a loss of points.**
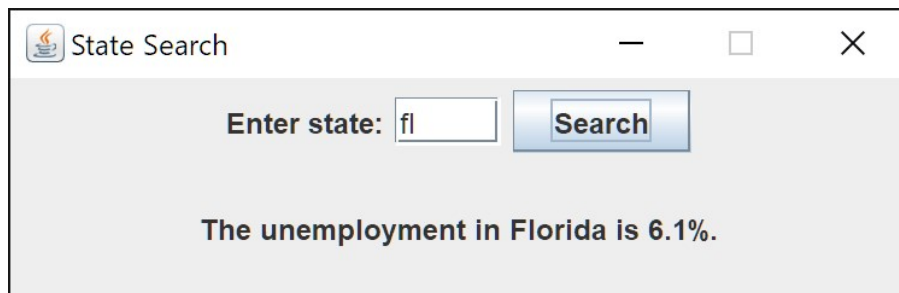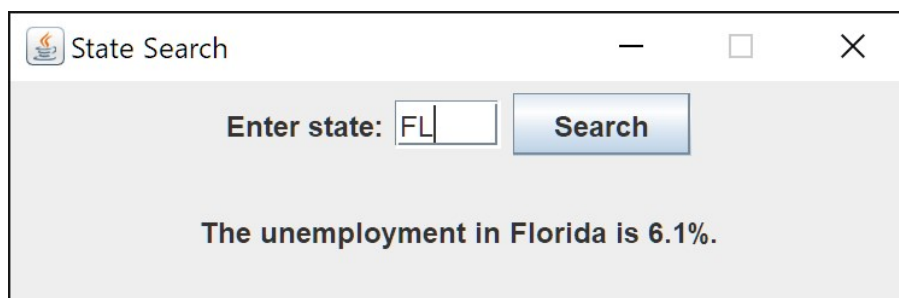
Always make sure to:

- Keep all source files in the folder called `src`, which is one directory in from the root of your repo

- Do not commit multiple copies of the same named source file; modify the ones provided to you. In other words, do not make an old and new version of the same file

- The main starting source file should always be called `Main`

- When loading resources, do not use absolute paths to files on your drive; use relative paths

- Do not have the keyword `package` at the top of any files. Some IDEs add your files to a custom package by default. Please remove this, as it complicates grading.

Rubric

Task	Percentage
Assignment files not pushed to GitHub	Grade is 0%
General attempt at solving the assignment	50%
Loading data properly	10%
Use of `Map` and `HashMap`	20%
Search fully supported based on requirements listed above	20%
Total	100%

Example Output

State Search   —   ☐   ✕

Enter state: Ny   Search

The unemployment in New York is 8.2%.

State Search   —   ☐   ✕

Enter state: CA   Search

The unemployment in California is 9.0%.

State Search   —   ☐   ✕

Enter state: NE   Search

The unemployment in Nebraska is 3.0%.

State Search   —   ☐   ✕

Enter state: kjsdf   Search

Error   ✕

❌ Could not find a state with that abbreviation.

OK