Data searching in Visual Basic II

Topics

- Reading from CSV files into parallel arrays
- Match and stop searching including handling "no match" situations
- Exhaustive searching including handling "no match" situations
- Answering questions using data
- Boolean datatype
- Using compound conditions
- Counting to analyze data
- Using nested loops

Instructions

5. Copy and paste the folder `Searching_Part4`. Rename the copy `Searching_Part5`. Launch the VS Express 2013 software and open the project `Searching_Part5`.

   Complete the action for `btnPlotByClass` to request a passenger class value as input from the user and count and display the number of passengers in that class who survived. You MUST use exhaustive searching. Test your program for the following input cases and make sure it produces the expected output shown in Table 3.

Table 3	
Input values for class	**Expected program output**
3	119
2	87
1	136

   Now, instead of displaying the count of matching passengers in the input class, modify your program to compute and print the percentage of survivors rounded to two decimal places. Test your program for the following input cases and make sure it produces the expected output shown in Table 4.

Table 4	
Input values for class	**Expected program output**
3	24.44%
2	47.28%
1	62.96%

   Do the results in the table above validate part or all the statement: "*one of the reasons that the shipwreck led to such loss of life was that there were not enough lifeboats for the passengers and crew. Although there was some element of luck involved in surviving the sinking, some groups of people were more likely to survive than others, such as women, children, and the upper-class passengers.*" Please discuss this with a nearby classmate.

   How would your program behave if you run it for input class 4? Try it. Are your getting an error? If so, why are you getting this error? Instead of an error, fix your program to display a suitable error message if the input class is not valid. Make sure your program still produces the expected output for all valid input class values in Table 4 above.

Checkpoint 5 (80/100)

☐ project uses exhaustive searching
☐ project produces correct search output for any passenger class, even those that do not exist
☐ project produces correct output for all test cases in Table 4

6. Copy and paste the folder `Searching_Part5`. Rename the copy `Searching_Part6`. Launch the VS Express 2013 software and open the project `Searching_Part6`.

Complete the action for `btnPlotByGender` so that it finds the percentage of survivors by gender (i.e., percentage of women survivors and percentage of men survivors) and prints the results in statements with the following format:

```
Percentage of female survivors was 74.20%
Percentage of male survivors was 19.02%
```

Checkpoint 6 (85/100)

☐ project uses exhaustive searching with a Boolean variable
☐ project produces correct output for file `Titanic.csv`

7. The project `Plots` inside your lab folder contains a simple data visualization project that produces a bar chart using Excel's plotting functionality from within a Visual Basic project. Open this project and run it to see the output it produces—by the way, this is the actual average cumulative GPAs of juniors and seniors for six departments at CSBSJU from Academic Year 2017-18. Study the code carefully.

Copy and paste the folder `Searching_Part6`. Rename the copy `Searching_Part7`. Launch the VS Express 2013 software and open the project `Searching_Part7`.

Update the action for `btnPlotByGender` to produce a bar chart for the percentage of survivors by gender like the one shown below. You will need to figure out a way to store the data needed on the bar chart's x-axis and y-axis in two arrays as is done in the sample project, `Plots`. Please note that while gender values won't change, the percentage of survivors is likely to change depending on the data read from the input file and thus can't be hard coded in your program; your program should work correctly for ANY valid input file.
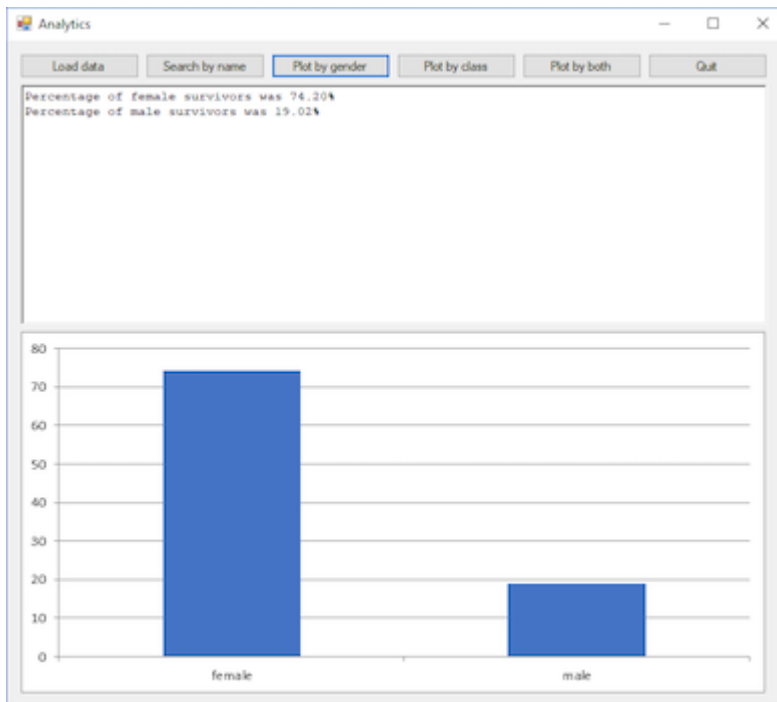

Does this verify the claim that certain groups of people, such as women, were more likely to survive than others? Please discuss this with a nearby classmate.

Checkpoint 7 (90/100)

☐ project uses data from file `Titanic.csv` to produce the correct bar chart for percentage of survivors by gender

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8. Copy and paste the folder `Searching_Part7`. Rename the copy `Searching_Part8`. Launch the VS Express 2013 software and open the project `Searching_Part8`.

   Update the action for `btnPlotByClass` so that it produces the following bar chart for the percentage of survivors by passenger class. Again, the percentage of survivors might change depending on the data read from the file and thus can't be hard coded in your program.
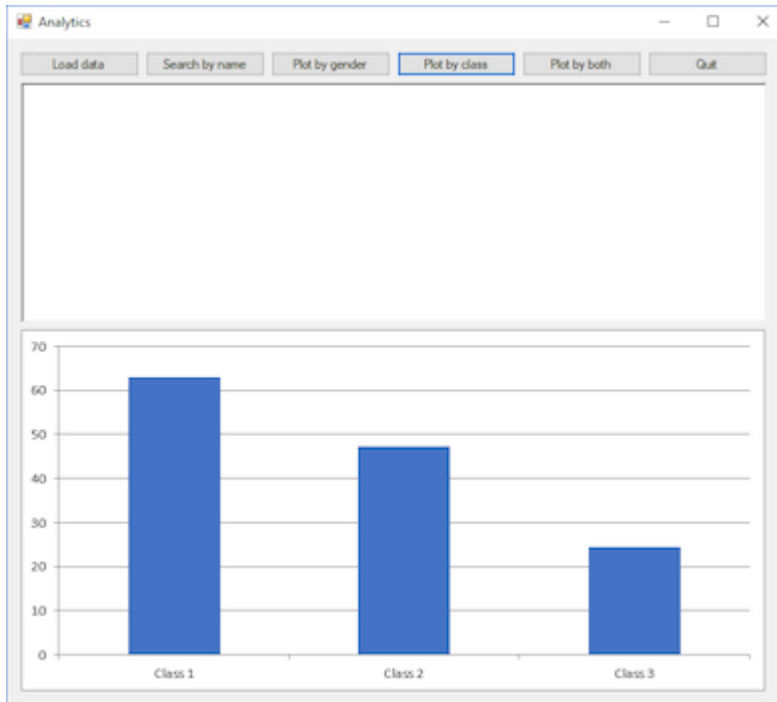
   Checkpoint 8 (100/100)

   ☐ project uses data from file `Titanic.csv` to produce the correct bar chart for percentage of survivors by class

9. As the number of values or labels on the x-axis increases, the program becomes more complex needing many counters as well as branches in the `if`-statement inside the loop used to distinguish among the labels. One way to simplify the code is to loop over the labels on the x-axis, and for each label, loop over the data in order to count survivors and total matches for that specific label. This way, only one if statement and two counters are needed (one for the total matches and another for survivors) provided they are reset back to zero for every new label. This solution uses a nested loop; there are definitely other ways to arrive at the same outcome and probably more efficiently, but we are more interested in simplicity at this stage.

   Copy and paste the folder `Searching_Part8`. Rename the copy `Searching_Part9`. Launch the VS Express 2013 software and open the project `Searching_Part9`.

   Complete the action for `btnPlotByBoth` so that it will produce the same bar chart from the previous step only using the nested loop logic described in this part.

10. Copy and paste the folder `Searching_Part9`. Rename the copy `Searching_Part10`. Launch the VS Express 2013 software and open the project `Searching_Part10`.

    Update the action for `btnPlotByBoth` using the same logic from the previous part to produce a bar chart for the percentage of survivors by gender and passenger class COMBINED.

    You will now need to use nested loops to go over both arrays (gender values array and passenger class values array) to create the labels for the x-axis before looping over the data to count (using yet another nested loop). The expected outcome is shown below. Have fun!

Checkpoint EC (110/100)

☐ project uses data from file `Titanic.csv` to produce the correct bar chart for percentage of survivors by gender AND passenger class

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Submission Instructions

Your `M:\CS130\Labs\Lab07_YourLastName_YourFirstName` folder should contain your solutions to this and Tuesday's lab.

To submit your work, copy this folder and paste it to `N:/Handins/CS130/Lab07_Searching` PRIOR to midnight tonight. Submissions received after 11:59pm tonight will be considered late and will receive a grade of 0.

You are not allowed to seek help from TAs on this lab outside lab time. TAs have been specifically instructed NOT to provide any help so please refrain from this activity.