Lab 3: Relational Database

For this lab, you will design a small database. Your database will be implemented by using a 2D array (no vectors). An example program showing how to manipulate 2D arrays has been provided for you. Your database can hold any kind of information that you like. Remember that an array in C++ must hold elements that are all of the same type, so either use all string fields or remember to cast any information when needed.

Program Specifications

- You may choose any theme EXCEPT for the one shown in the example. Your database must be able to hold up to 20 records. It must have at least 4 fields and a primary key.
- Your program must allow the user to add a record, remove a record, and display the whole database. The database does not need to be kept in any sort of particular order.
- Your program must allow the user to filter on a particular field. You should ask the user which field and particular value he/she wants to filter on. For instance, in the example below, the database holds information about a party. The user may want to filter on the field "Item Bringing" and the value "cookies". Any records whose "Item Bringing" field holds "cookies" should be displayed. You do not have to correct for differences in capitalization; you can search for exactly what the user input.
- Create a PDF containing screen-shots of your program adding some records, displaying those records, removing an item (then displaying showing that the record was indeed removed), and filtering on a field.

Required Data Validation

- When adding a record, no field may be blank.
- When adding a record, the primary key must be unique.
- Display an error message if the user tries to delete a record that does not exist.
- Do not let the user filter on non-existent fields. You do NOT have to verify that the particular value the user enters is valid.

Hints and Tips

- You may assume that the information the user inputs in to the database is valid data, other than the data must not be empty.
- Use an enum or constant ints to keep your menu options straight, if you use a menu.
- Get something working. It's better to turn in a database that can only add items than not to turn in anything at all.

Check list

Your code must have a name header as described in the syllabus. Each of these items is worth two points of your grade.

Your output must

- Have a title in the output
- Include a short paragraph indicating the purpose of the application to the user
- Use complete and clear sentences – do not assume the user knows what you expect from him/her.
- Have NO grammatical errors and/or spelling errors.
- Have NO typos – this includes using capital letters at the beginning of a sentence and punctuation at the end of sentences.

Example Output

Here is an example for what your program's output could look like. Yours doesn't have to look exactly like this. User input is in blue.

```
   Title Goes Here
---------------------------------------

Welcome to this database.  This database will help you keep track of
your party attendees.  You can store guests' names, what item he/she is
bringing, how many additional guests he/she is bringing along, and
whether or not the guest will be driving.
---------------------------------------

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 1
Enter the guest's name:  Afton
Enter the item Afton is bringing:  chips
How many additional guests is Afton bringing?  2
Will Afton be driving to the party?  no

Added guest number:  1000

Main Menu:
1.  Add a record
```

```
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 1
Enter the guest's name:  Herschel
Enter the item Herschel is bringing:  soda
How many additional guests is Herschel bringing?  0
Will Herschel be driving to the party?  yes

Added guest number:  1001

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 3


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self
        1000             Afton             chips                   2                  no
        1001          Herschel              soda                   0                 yes
Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 1
Enter the guest's name:  Mul
Enter the item Mul is bringing:  Turnips
How many additional guests is Mul bringing?  8
Will Mul be driving to the party?  yes

Added guest number:  1002

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit
```

```
>>> 3


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self
        1000             Afton             chips                   2                  no
        1001          Herschel              soda                   0                 yes
        1002               Mul           Turnips                   8                 yes

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 2
Enter the guest number to remove:  1001
Removed guest number:  1001

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 3


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self
        1000             Afton             chips                   2                  no
        1002               Mul           Turnips                   8                 yes

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 1
Enter the guest's name:  Hunter
Enter the item Hunter is bringing:  chips
How many additional guests is Hunter bringing?  2
Will Hunter be driving to the party?  yes

Added guest number:  1003

Main Menu:
```

```
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 4

Available Fields:
0.  Guest Number
1.  Guest Name
2.  Item Bringing
3.  Number of Additional Guests
4.  Guest is Driving Self

Enter the number of the field you want:  2
Enter value to filter on:  chips


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self
        1000             Afton             chips                   2                  no
        1003            Hunter             chips                   2                 yes

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 4

Available Fields:
0.  Guest Number
1.  Guest Name
2.  Item Bringing
3.  Number of Additional Guests
4.  Guest is Driving Self

Enter the number of the field you want:  3
Enter value to filter on:  0


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
```

```
4.  Filter records by field value
5.  Quit

>>> 2
Enter the guest number to remove:  1234
That guest does not exist

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 3


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self
        1000             Afton             chips                   2                  no
        1002               Mul           Turnips                   8                 yes
        1003            Hunter             chips                   2                 yes

Main Menu:
1.  Add a record
2.  Delete a record
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 4

Available Fields:
0.  Guest Number
1.  Guest Name
2.  Item Bringing
3.  Number of Additional Guests
4.  Guest is Driving Self

Enter the number of the field you want:  3
Enter value to filter on:  2


Guest Number        Guest Name     Item Bringing     # Addt'l Guests  Guest Driving Self
        1000             Afton             chips                   2                  no
        1003            Hunter             chips                   2                 yes

Main Menu:
1.  Add a record
2.  Delete a record
```

```
3.  Display all records
4.  Filter records by field value
5.  Quit

>>> 5
```

What to Turn In

Put your .cpp and .h (if you have any) files and the PDF of your output as described in the program requirements in a zip folder labeled with the assignment name and your last name (e.g. lab1_rodgers.zip) You should not zip the entire solution folder (if you are using Visual Studio).