

Programming project report

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Description

This program is made to be able to create and maintain a phone directory. Each contact in the phone directory is saved in a file name "Book.txt" containing certain details of each contact.

Details recorded in the directory are:

Last name
First name
Date of birth
Address
Phone number
E-mail

The program allows the user to perform the following functions:

1. Load
2. Query
3. ADD
4. Delete
5. Modify
6. Print
7. Save
8. Quit

Sample Runs

1-Load function

Load function is used to store the Book.txt file into the memory to be able to perform tasks on it as print, query, add or delete.

The user just needs to choose Load from the menu.

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 1
}
flag value 0
FILE LOADED
}
flag value 1
```

A flag value will be given to indicate that the file was loaded successfully.

User must Load the file to be able to perform task, However, if the user forgot to load the file, do not worry, as our Program will load the file whenever a task is chosen, therefore there is no need to worry if the user forgot to load the file.

```
Select C:\Users\Mazen\Desktop\Programming project\bin\Debug
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 6
FILE LOADED
Print the directory sorted by:

1.Sorted by last name
2.Sorted by date of birth
0.To exit:
Choose 0, 1 or 2: _
```

The file must be named as "Book" and the file type must be .txt, text file.

If these requirements do not occur the program will not be able to load the file

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option:
1

flag value 0
No data found. Try add some contacts and save them then try again.
```

2-Query function

The query function is made so the user can search the details about a contact in the directory as long as the user supply the program with that person's last name, and the system will provide the first name, address, email and phone.

Consider this to be the directory details.

A, G,1-1-2000,15 almatar Street,0123381034, OmAh@riot.com
B, H,2-1-2001,20 albert Street,0123455153, PreBot@gmail.com
C, I,3-1-2001,22 fawzy Street,01234541673, Qu.Car@hotmail.com
D, J,4-1-2001,26 napleon Street,01234517625, Roy.Don@outlook.com
E, K,2-5-2002,28 ali Street,01234519895, StevEin@yahoo.com
F, L,3-6-2000,26 Elhoreya Street,01234567899, sthomas@gmail.com

The user will be asked to provide with the person's last name.

Assume the user wanted to search for

B, H,2-1-2001,20 albert Street,0123455153, PreBot@gmail.com

```
Enter Last Name To Search for contacts or type (0) to return: b

Contact 1:
The First Name Is: H
The Date Of Birth Is 2/1/2001
Address Is: 20 albert Street
Email Is: PreBot@gmail.com
Phone number Is: 0123455153
```

If the last name given by the user is not found in the directory will program will give an error message

```
Enter Last Name To Search for contacts or type (0) to return: k
User Not Found
```

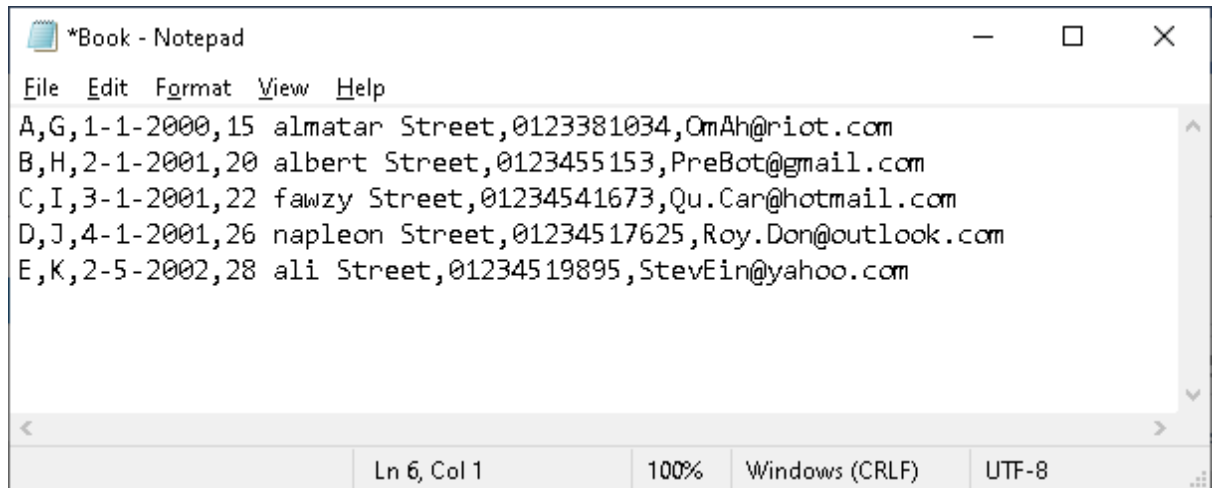
User can type 0 to return to the main menu.

3-ADD function.

The user is given the option to be able to add contacts in the directory.

The user calls the function to add a contact to the contacts array. The user is asked field by field to enter data, the data is passed by validation functions if valid the input is saved, if not the user is asked to enter another valid form of data. The user has the option to leave mid-process by entering "0" as input, and any prior inputs is not added to the array.

If this is our Book.txt file



```
*Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
C,I,3-1-2001,22 fawzy Street,01234541673,Qu.Car@hotmail.com
D,J,4-1-2001,26 napleon Street,01234517625,Roy.Don@outlook.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
Ln 6, Col 1 100% Windows (CRLF) UTF-8
```

And we want to add this contact to our directory.

F, L,3-6-2000,26 Elhoreya Street,01234567899, sthomas@gmail.com

First the user will choose ADD from the main menu and will be asked to give each detail to be added in the directory.

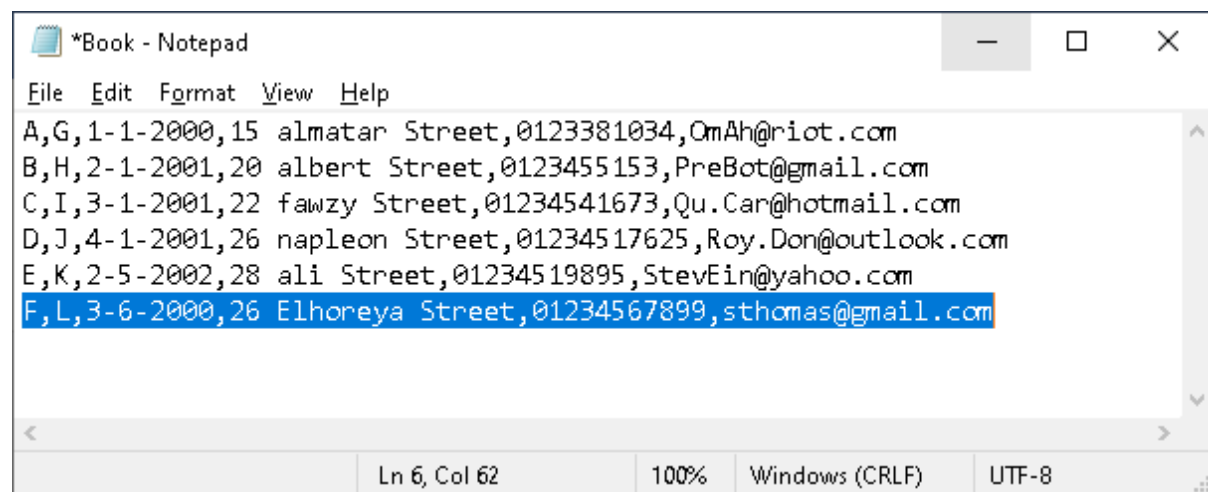
```
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 3

Enter contact to be added:
Enter 0 to leave the function
Last name: F
First name: L
Date of birth:
Day ?: 3
Month ?: 6
Year ?: 2000
Address: 26 Elhoreya street
Phone number: 01234567899
E-mail: sthomas@gmail.com
CONTACT ADDED
```

The user must save after adding any contacts to the directory.

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

This is our Book.txt now.



The user can enter 0 to return to the main menu.

```
Enter contact to be added:
Enter 0 to leave the function
Last name: F
First name: L
Date of birth:
Day ?: 0

1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option:
```

No data will be recorded in the memory.

The user must enter a valid date of birth, a valid phone number and a valid E-mail for the contact to be added in the directory.

Enter contact to be added: Enter 0 to leave the function Last name: F First name: L Date of birth: Day ?: 3 Month ?: 66 Year ?: 2000 NONE VALID BIRTH DATE	Enter contact to be added: Enter 0 to leave the function Last name: F First name: L Date of birth: Day ?: 3 Month ?: 6 Year ?: 2000 Address: 26 Elhoreya street Phone number: 012345a5789 NONE VALID PHONE NUMBER
--	---

Phone number: 01234567899 E-mail: sthomas@gmail.com NONE VALID EMAIL ADDRESS	E-mail: sthomas@gmail..com NONE VALID EMAIL ADDRESS
--	--

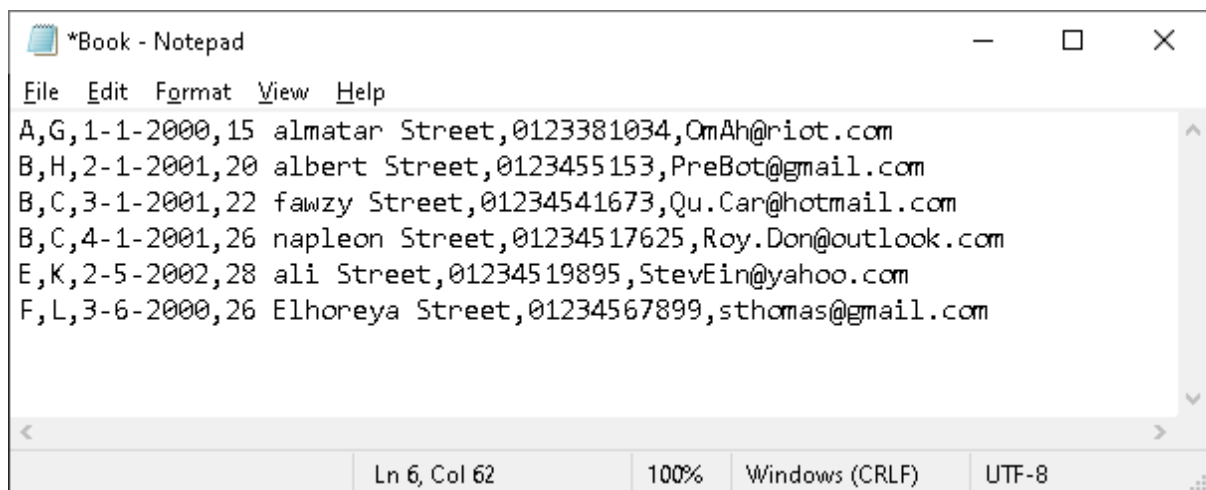
4-Delete function.

If the user wants to delete a contact from the directory, the user will be asked to enter the last and first name of that contact in the directory.

The user enters the first name and last name of contact to be deleted. The function iterates over the array of contacts. If none found, none is deleted. If the contact is found the function continues its iteration while shifting the rest of the contacts one contact backward, so the “chosen” contact is overwritten aka deleted.

According to entered first and last name once the contact is found it is deleted, and a message is displayed.

Assume this is our Book.exe



```
*Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
B,C,3-1-2001,22 fawzy Street,01234541673,Qu.Can@hotmail.com
B,C,4-1-2001,26 napleon Street,01234517625,Roy.Don@outlook.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
F,L,3-6-2000,26 Elhoreya Street,01234567899,sthomas@gmail.com
Ln 6, Col 62 100% Windows (CRLF) UTF-8
```

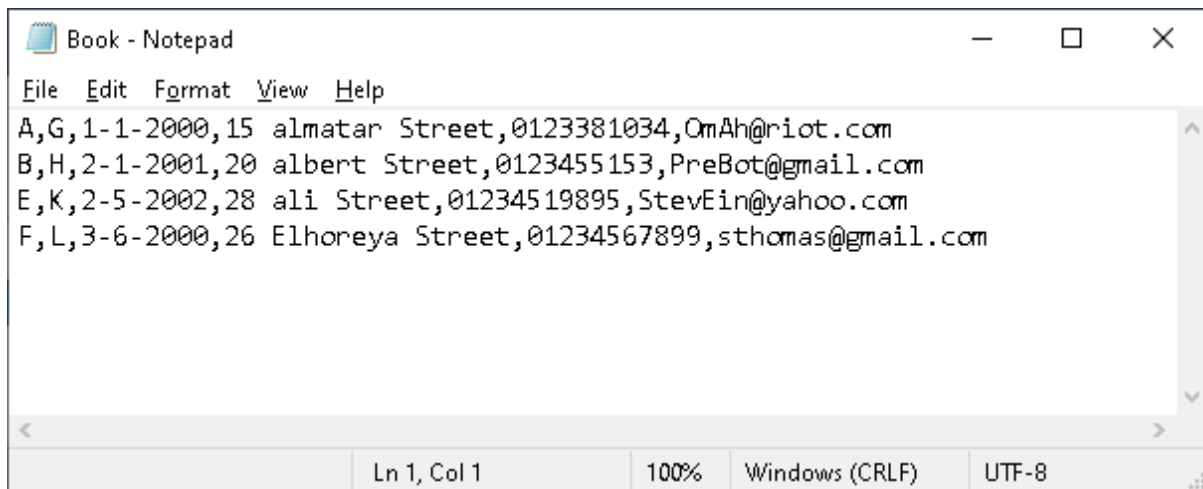
And assume we want to delete all contacts with last name B and first name C.

The user will input B in the last name and C in the first name, then save the changes.

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 4
enter the last name which you want to delete or type (0) to return: B
enter the first name which you want to delete: C
CONTACT DELETED

1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

This is our Book.txt after deleting contacts of first name C and last name B.



```
Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
F,L,3-6-2000,26 Elhoreya Street,01234567899,sthomas@gmail.com
Ln 1, Col 1 100% Windows (CRLF) UTF-8
```

User must make sure that the first and last name exist in the directory or the program will give an error message.

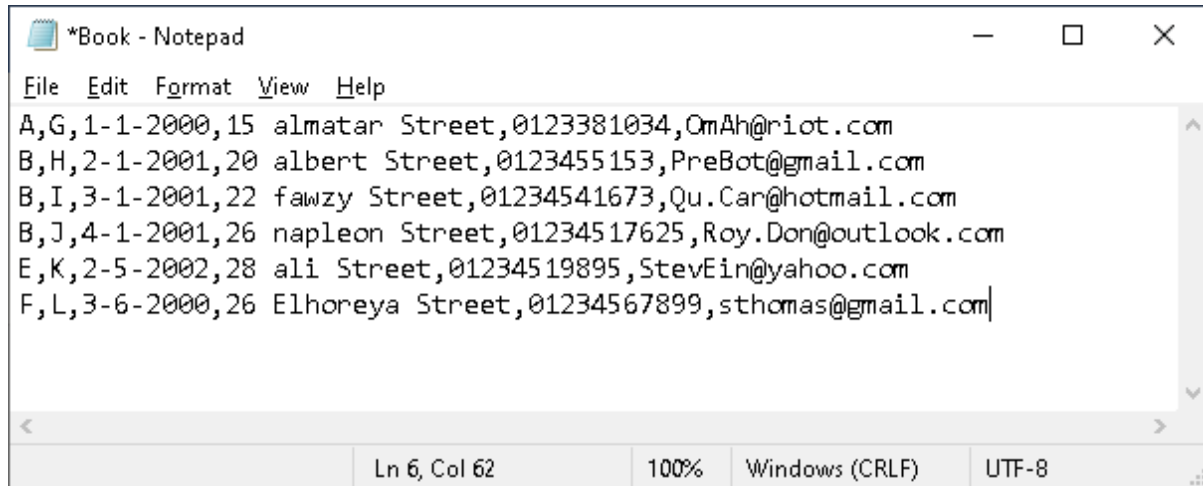
```
enter the last name which you want to delete or type (0) to return: BB
enter the first name which you want to delete: C
There is no contact with such last and first name
```

User can Enter (0) to return back to the main menu.

5-Modify function.

Modify function allows the user to edit the details of a certain contact in the directory by giving the program the last name of the contact they want to edit.

Assume this is our Book.txt



```
*Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
B,I,3-1-2001,22 fawzy Street,01234541673,Qu.Car@hotmail.com
B,J,4-1-2001,26 napleon Street,01234517625,Roy.Don@outlook.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
F,L,3-6-2000,26 Elhoreya Street,01234567899,sthomas@gmail.com
Ln 6, Col 62 100% Windows (CRLF) UTF-8
```

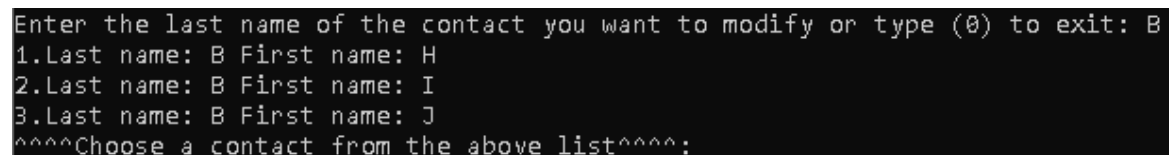
And we want to modify.

B, I,3-1-2001,22 fawzy Street,01234541673, Qu.Car@hotmail.com

To

B, I,3-1-2001,22 fawzy Street,01234541673, RiotBlaustoise@gmail.com

First the user will provide the program with the last name of the contact they want to edit.



```
Enter the last name of the contact you want to modify or type (0) to exit: B
1.Last name: B First name: H
2.Last name: B First name: I
3.Last name: B First name: J
^^^^Choose a contact from the above list^^^^:
```

If the user's input last name is repeated, the user will be given the option to choose which contact they want to edit.

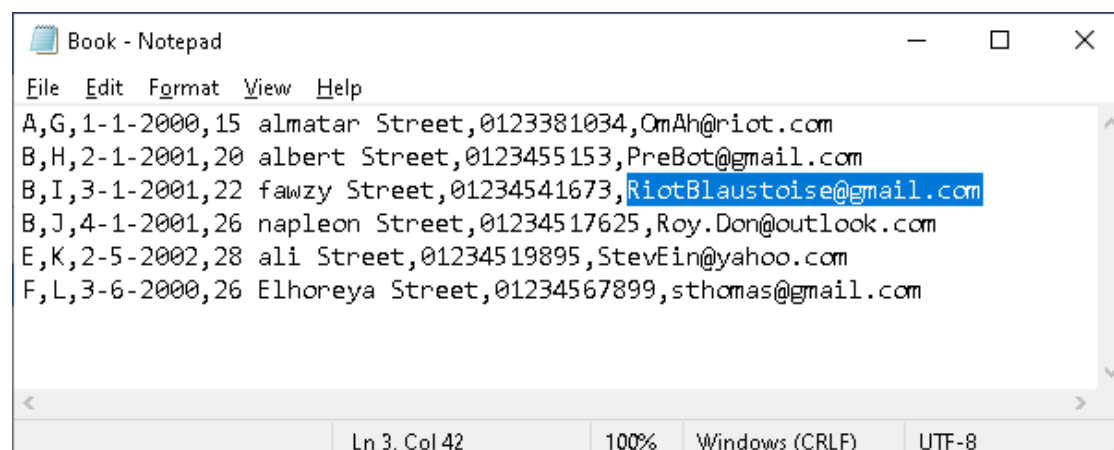
After the user chooses the contact needed to edit, the user will then choose which detail they want to edit in this contact, then edit it and save.

```
^^^^Choose a contact from the above list^^^^: 2
1Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 6
Enter the new e-mail: RiotBlaustoise@gmail.com
Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 7

flag value 1

1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

This is the Book.txt after editing email.



If the user wants to modify

B, I,3-1-2001,22 fawzy Street,01234541673, RiotBlaustoise@gmail.com

To

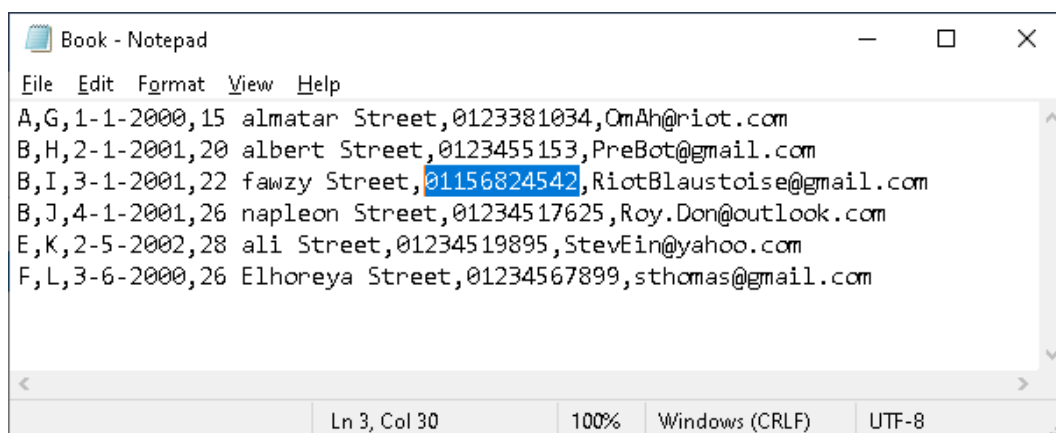
B, I,3-1-2001,22 fawzy Street,01156824542, RiotBlaustoise@gmail.com

```
1.Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 5
Enter the new phone number: 01156824542
Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 7

flag value 1

1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

This is Book.txt after modifying



```
Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
B,I,3-1-2001,22 fawzy Street,01156824542,RiotBlaustoise@gmail.com
B,J,4-1-2001,26 napleon Street,01234517625,Roy.Don@outlook.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
F,L,3-6-2000,26 Elhoreya Street,01234567899,sthomas@gmail.com
Ln 3, Col 30 100% Windows (CRLF) UTF-8
```

If the user wants to modify

B, I,3-1-2001,22 fawzy Street,01156824542, RiotBlaustoise@gmail.com

To

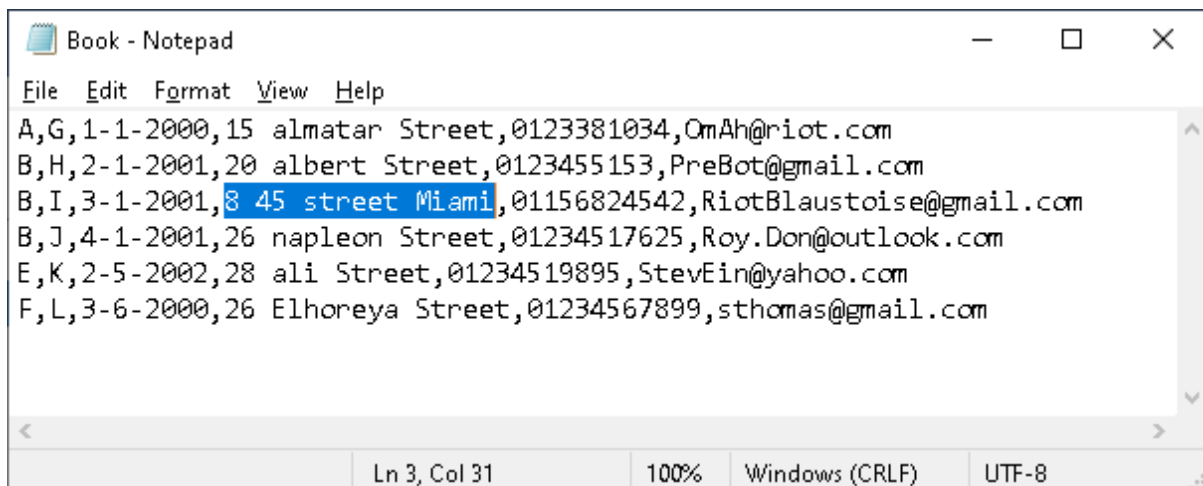
B, I,3-1-2001,8 45 street Miami,01156824542, RiotBlaustoise@gmail.com

```
1.Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 4
Enter the new Address: 8 45 street Miami
Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 7

flag value 1

1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

Book.txt after modifying.



```
Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
B,I,3-1-2001,8 45 street Miami,01156824542,RiotBlaustoise@gmail.com
B,J,4-1-2001,26 napleon Street,01234517625,Roy.Don@outlook.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
F,L,3-6-2000,26 Elhoreya Street,01234567899,sthomas@gmail.com
Ln 3, Col 31 100% Windows (CRLF) UTF-8
```


If the user wants to modify

B, I,3-1-2001,22 fawzy Street,01156824542, RiotBlaustoise@gmail.com

To

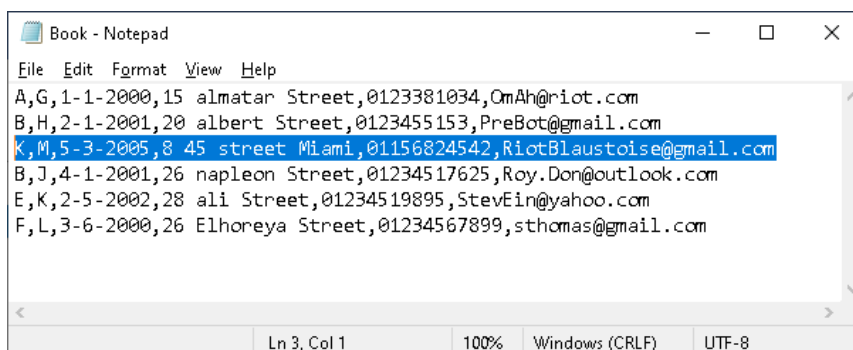
K, M,5-3-2005,8 45 street Miami,01156824542, RiotBlaustoise@gmail.com

```
1Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 1
Enter the new Last name: K
Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 2
Enter the new First name: M
Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 3
Enter the new Date of birth:
day? :5
month? :3
year? :2005
Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 7

flag value 1

1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

Book.txt after modifying.



```
Book - Notepad
File Edit Format View Help
A,G,1-1-2000,15 almatar Street,0123381034,OmAh@riot.com
B,H,2-1-2001,20 albert Street,0123455153,PreBot@gmail.com
K,M,5-3-2005,8 45 street Miami,01156824542,RiotBlaustoise@gmail.com
B,J,4-1-2001,26 napleon Street,01234517625,Roy.Don@outlook.com
E,K,2-5-2002,28 ali Street,01234519895,StevEin@yahoo.com
F,L,3-6-2000,26 Elhoreya Street,01234567899,sthomas@gmail.com

Ln 3, Col 1 100% Windows (CRLF) UTF-8
```

6-Print function:

The print function is chosen when the user wants to see the contents of the entire directory sorted based on the last name and the first name depending on the choice of the user.

Sample run:

Consider this to be the contents of the directory.

A, G,1-1-2000,15 almatar Street,0123381034, OmAh@riot.com
B, H,2-1-2001,20 albert Street,0123455153, PreBot@gmail.com
C, I,3-1-2001,22 fawzy Street,01234541673, Qu.Car@hotmail.com
D, J,4-1-2001,26 napleon Street,01234517625, Roy.Don@outlook.com
E, K,2-5-2002,28 ali Street,01234519895, StevEin@yahoo.com
F, L,3-6-2000,26 Elhoreya Street,01234567899, sthomas@gmail.com

First the user will be given the option to choose which sorting they want:

```
Print the directory sorted by:  
  
1.Sorted by last name  
2.Sorted by date of birth  
0.To exit:  
Type 0, 1 or 2:
```

If the user chose (1), sorted by last name, the directory will be printed sorted alphabetically to the last name.

```
Type 0, 1 or 2:1
Sorted by last name:

Details of user 1 in the directory
Last name:A
First name:G
Date of birth:1-1-2000
address:15 almatar Street
phone number:0123381034
Email:0mAh@riot.com

Details of user 2 in the directory
Last name:B
First name:H
Date of birth:2-1-2001
address:20 albert Street
phone number:0123455153
Email:PreBot@gmail.com

Details of user 3 in the directory
Last name:C
First name:I
Date of birth:3-1-2001
address:22 fawzy Street
phone number:01234541673
Email:Qu.Car@hotmail.com

Details of user 4 in the directory
Last name:D
First name:J
Date of birth:4-1-2001
address:26 napleon Street
phone number:01234517625
Email:Roy.Don@outlook.com

Details of user 5 in the directory
Last name:E
First name:K
Date of birth:2-5-2002
address:28 ali Street
phone number:01234519895
Email:StevEin@yahoo.com

Details of user 6 in the directory
Last name:F
First name:L
Date of birth:3-6-2000
address:26 Elhoreya Street
phone number:01234567899
Email:sthomas@gmail.com
```

If the user chose (2) they will be given the option to choose the sorting (oldest to youngest) or (youngest to oldest).

```
1.Sorted by last name
2.Sorted by date of birth
0.To exit:
Choose 0, 1 or 2:2

Sorted by date of birth:

1.Sort from youngest to oldest
2.Sort from oldest to youngest
0.exit
choose 1, 2 or 0:
```

If the user chose (1) the directory will be printed from youngest to oldest

```
choose 1, 2 or 0:1

Sorted from youngest to oldest:

Details of user 1 in the directory
Last name:E
First name:K
Date of birth:2-5-2002
address:28 ali Street
phone number:01234519895
Email:StevEin@yahoo.com

Details of user 2 in the directory
Last name:D
First name:J
Date of birth:4-1-2001
address:26 napleon Street
phone number:01234517625
Email:Roy.Don@outlook.com

Details of user 3 in the directory
Last name:C
First name:I
Date of birth:3-1-2001
address:22 fawzy Street
phone number:01234541673
Email:Qu.Car@hotmail.com

Details of user 4 in the directory
Last name:B
First name:H
Date of birth:2-1-2001
address:20 albert Street
phone number:0123455153
Email:PreBot@gmail.com

Details of user 5 in the directory
Last name:F
First name:L
Date of birth:3-6-2000
address:26 Elhoreya Street
phone number:01234567899
Email:stthomas@gmail.com

Details of user 6 in the directory
Last name:A
First name:G
Date of birth:1-1-2000
address:15 almatar Street
phone number:0123381034
Email:OmAh@riot.com
```

If the user chose (2) it will print from oldest to youngest

```
choose 1, 2 or 0:2

Sorted from oldest to youngest:

Details of user 1 in the directory
Last name:A
First name:G
Date of birth:1-1-2000
address:15 almatar Street
phone number:0123381034
Email:OmAh@riot.com

Details of user 2 in the directory
Last name:F
First name:L
Date of birth:3-6-2000
address:26 Elhoreya Street
phone number:01234567899
Email:stthomas@gmail.com

Details of user 3 in the directory
Last name:B
First name:H
Date of birth:2-1-2001
address:20 albert Street
phone number:0123455153
Email:PreBot@gmail.com

Details of user 4 in the directory
Last name:C
First name:I
Date of birth:3-1-2001
address:22 fawzy Street
phone number:01234541673
Email:Qu.Car@hotmail.com

Details of user 5 in the directory
Last name:D
First name:J
Date of birth:4-1-2001
address:26 napoleon Street
phone number:01234517625
Email:Roy.Don@outlook.com

Details of user 6 in the directory
Last name:E
First name:K
Date of birth:2-5-2002
address:28 ali Street
phone number:01234519895
Email:StevEin@yahoo.com
```

The user must enter (1) or (2) or (0), any other input is unavailable.

```
1.Sorted by last name
2.Sorted by date of birth
0.To exit:
Choose 0, 1 or 2:a
Invalid request,please type '1' or '2'

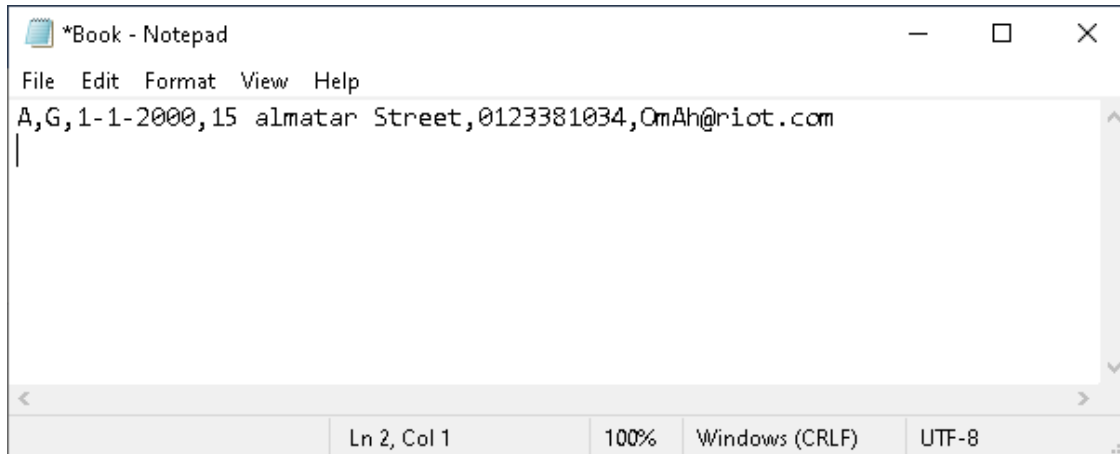
Print the directory sorted by:

1.Sorted by last name
2.Sorted by date of birth
0.To exit:
Choose 0, 1 or 2:5
Invalid request,please type '1' or '2'
```

7-Save function.

Save function is made to allow the user to save any changes the user have done to the directory.

Assume this is our book.txt



And the user used the add function to add 2 new contacts.

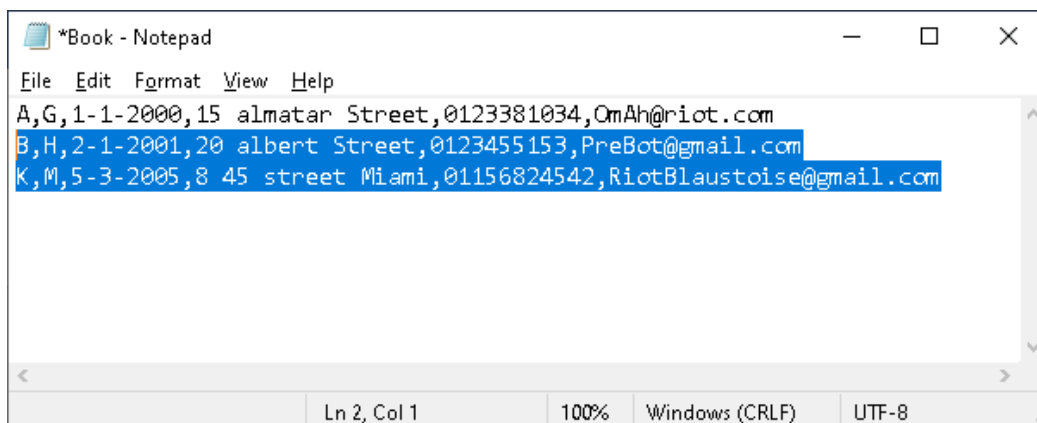
B, H,2-1-2001,20 albert Street,0123455153, PreBot@gmail.com

K, M,5-3-2005,8 45 street Miami,01156824542, RiotBlaustoise@gmail.com

The user will use the add function to add these contacts to the directory, then the user must use the save function to apply these changes to the book.txt

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

This is Book.txt after saving



8-Validations

Birthday Validation function

The birthday validation function is used to test if the Birthday entered by the user is valid or not valid.

when a date is entered, it should be within the known ranges; months from 1 to 12, days from 1 to 31 and year from 1900 to 2021.

```
Date of birth:  
Day ?: a  
Month ?: b  
Year ?: c  
NONE VALID BIRTH DATE
```

```
Date of birth:  
Day ?: 2a  
Month ?: k2  
Year ?: 90  
NONE VALID BIRTH DATE
```

```
Date of birth:  
Day ?: 35  
Month ?: 12  
Year ?: 1990  
NONE VALID BIRTH DATE
```

```
Date of birth:  
Day ?: 20  
Month ?: 5  
Year ?: 2025  
NONE VALID BIRTH DATE
```

```
Date of birth:  
Day ?: 20  
Month ?: 17  
Year ?: 2001  
NONE VALID BIRTH DATE
```

```
Date of birth:  
Day ?: 21  
Month ?: 5  
Year ?: 1800  
NONE VALID BIRTH DATE
```


Phone number validation

The phone number validation function is used to test if the phone number entered by the user is valid or not valid.

The number could start with “+” for international numbers and should consist of digits solely.

```
Phone number: 0123a45678
NONE VALID PHONE NUMBER

Phone number: a0124123
NONE VALID PHONE NUMBER

Phone number: .31341.134a23
NONE VALID PHONE NUMBER

Phone number: 01341a3k13a
NONE VALID PHONE NUMBER

Phone number: 01129412414
NONE VALID PHONE NUMBER
```

E-mail validation

The E-mail validation function is used to test if the E-mail entered by the user is valid or not valid.

```
E-mail: fady.@gmail.com  
NONE VALID EMAIL ADDRESS
```

```
E-mail: hayam@gmail.com  
NONE VALID EMAIL ADDRESS
```

```
E-mail: mazen@@gmail.com  
NONE VALID EMAIL ADDRESS
```

```
E-mail: nehal@gmail..com  
NONE VALID EMAIL ADDRESS
```

```
E-mail: .fady@gmail.com  
NONE VALID EMAIL ADDRESS
```

```
E-mail: mazen ghanem @gmail.com  
NONE VALID EMAIL ADDRESS
```

Algorithm

Algorithm used in sorting contacts in the directory.

Sorting by last name:

Sorting by last name was done with C code using string function strcasecmp() and bubble sorting .

Algorithm

- 1- A for loop that passes every single contact in the directory.
- 2- Another for loop that passes with the element beside the index of the first loop.
- 3- If the string value of element (index=0) is less than the string value of element (index =1), then swap both strings
- 4- If the string value of element (index=0) is greater than the string value of element (index =1), then move to the next element and repeat step 3
- 5- Loop ends after it passes all elements that belong to the directory.
- 6- Print directory after bubble sorting was done to the directory.

Code

```
int i;
int j;
directory temp;
for(i=0; i<count; i++)
{
    for(j=i+1; j<count; j++)
    {
        if(strcasecmp(x[i].Last_name,x[j].Last_name)>0)
        {
            temp=x[j];
            x[j]=x[i];
            x[i]=temp;
        }
    }
}
for(i=0; i<count; i++)
{
    printf("\nDetails of user %d in the directory\n",i+1);
    printf("Last name:%s\n",x[i].Last_name);
    printf("First name:%s\n",x[i].First_name);
    printf("Date of birth:%d-%d-%d\n",x[i].Date_of_Birth.day,x[i].Date_of_Birth.month,x[i].Date_of_Birth.year);
    printf("address:%s\n",x[i].address);
    printf("phone number:%s\n",x[i].phone_number);
    printf("Email:%s\n\n",x[i].email);
}
```

Sorting by date of birth

Sorting from youngest to oldest

Sorting was done using bubble sorting between integers.

ALGORITHM

- 1- Starting with the first element (index = 0), compare the current element with the next element of the array.
- 2- If the current element is less than the next element of the array, swap them.
- 3- If the current element is greater than the next element, move to the next element.
Repeat Step 2.
- 4- Print the directory after the bubble sorting.

CODE

```
for(i=0; i<count; i++)
{
    for(j=i+1; j<count; j++)
    {
        if(x[i].Date_of_Birth.year<x[j].Date_of_Birth.year)
        {
            temp=x[j];
            x[j]=x[i];
            x[i]=temp;
        }
        if(x[i].Date_of_Birth.year==x[j].Date_of_Birth.year)
        {
            if(x[i].Date_of_Birth.month<x[j].Date_of_Birth.month)
            {
                temp=x[j];
                x[j]=x[i];
                x[i]=temp;
            }
            if(x[i].Date_of_Birth.month==x[j].Date_of_Birth.month)
            {
                if(x[i].Date_of_Birth.day<x[j].Date_of_Birth.day)
                {
                    temp=x[j];
                    x[j]=x[i];
                    x[i]=temp;
                }
            }
        }
    }
}
printf("\nSorted from youngest to oldest:\n");
for(i=0; i<count; i++)
{
    printf("\nDetails of user %d in the directory\n",i+1);
    printf("Last name:%s\n",x[i].Last_name);
    printf("First name:%s\n",x[i].First_name);
    printf("Date of birth:%d-%d-%d\n",x[i].Date_of_Birth.day,x[i].Date_of_Birth.month,
        x[i].Date_of_Birth.year);
    printf("address:%s\n",x[i].address);
    printf("phone number:%s\n",x[i].phone_number);
    printf("Email:%s\n\n",x[i].email);
}
```

Sorting from oldest to youngest

Sorting was done using bubble sorting between integers.

ALGORITHM

- 1- Starting with the first element (index = 0), compare the current element with the next element of the array.
- 2- If the current element is greater than the next element of the array, swap them.
- 3- If the current element is less than the next element, move to the next element.
- 4- Repeat Step 2.
- 5- Print the directory after the bubble sorting.

CODE

```
for(i=0; i<count; i++)
{
    for(j=i+1; j<count; j++)
    {
        if(x[i].Date_of_Birth.year>x[j].Date_of_Birth.year)
        {
            temp=x[j];
            x[j]=x[i];
            x[i]=temp;
        }
        if(x[i].Date_of_Birth.year==x[j].Date_of_Birth.year)
        {
            if(x[i].Date_of_Birth.month>x[j].Date_of_Birth.month)
            {
                temp=x[j];
                x[j]=x[i];
                x[i]=temp;
            }
            if(x[i].Date_of_Birth.month==x[j].Date_of_Birth.month)
            {
                if(x[i].Date_of_Birth.day>x[j].Date_of_Birth.day)
                {
                    temp=x[j];
                    x[j]=x[i];
                    x[i]=temp;
                }
            }
        }
    }
}
printf("\nSorted from oldest to youngest:\n");
for(i=0; i<count; i++)
{
    printf("\nDetails of user %d in the directory\n",i+1);
    printf("Last name:%s\n",x[i].Last_name);
    printf("First name:%s\n",x[i].First_name);
    printf("Date of birth:%d-%d-%d\n",x[i].Date_of_Birth.day,x[i].Date_of_Birth.month,
        x[i].Date_of_Birth.year);
    printf("address:%s\n",x[i].address);
    printf("phone number:%s\n",x[i].phone_number);
    printf("Email:%s\n\n",x[i].email);
}
```

Algorithm used for searching contacts in the directory.

ALGORITHM

- 1- When the user chooses the QUERY option a message appears to the user asking to enter the last name required to be searched for.
- 2- When the user enters the last name, the entered data is then stored in an array 'L'.
- 3- Using strcmp(), the program compares the entered data stored in "L" array and if it is equal to "0", this means that the user will return to the main menu.
- 4- If not, the system then enters a for loop with index i=0 and starts to compare each element of the entered data in this array with that stored in the directory using strcmp().
- 5- If both arrays match with each other, the program starts to execute some commands such as:
 - Increment an integer "s" by 1, which indicates the order of the contact found by the program that matches the entered data by the user.
 - Print "The First Name Is".
 - Print "The Date of Birth Is".
 - Print "Address Is".
 - Print "Phone number Is".
- 6- These steps are repeated when more than one contact has the same last name which the user enters, and the system should provide these contacts and their information.
- 7- The search ends as long as i=count and s is not equal zero.
- 8- If the last name entered by the user does not match any data in the directory a message appears to the user "User Not Found".

CODE

```
void QUERY()
{
    int s=0;
    char L[20];
    int i;
    while(1)
    {
        printf("Enter Last Name To Search for contacts or type (0) to return: ")
        scanf("%s",L);
        if((strcasecmp(L,"0")==0)
            return;
        for(i=0; i<count; i++)
        {
            if((strcasecmp(L,x[i].Last_name))==0)
            {
                s++;
                printf("\n\nContact %d:\n",s);
                printf("The First Name Is: %s\n",x[i].First_name);
                printf("The Date Of Birth Is %d/%d/%d\n",x[i].Date_of_Birth.day,
                    x[i].Date_of_Birth.month,x[i].Date_of_Birth.year);
                printf("Address Is: %s\n",x[i].address);
                printf("Email Is: %s\n",x[i].email);
                printf("Phone number Is: %s\n",x[i].phone_number);
            }
        }
        if (i==count&&s!=0)
            return;
        else if (s==0)
            printf("User Not Found\n");
    }
}
```

User manual

The user will run the program and the first thing he will see is the main menu.

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option:
```

The user will be given the option to perform one of the following tasks.

Load: To load the directory file named Book.txt file

Query: to search for a certain contact in the directory

ADD: to add contacts to the directory

Delete: to delete contacts from the directory

Modify: to modify a certain detail in the directory

Print: to print contents of the directory sorted in a certain order the user chooses

Save: to save any changes done to the directory

Quit: to exit the program

The user can choose any of the tasks by simply entering a number from (1-8)

Anything else will result in an error message.

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: L
Not a correct choice, choose a number between 1 and 8
```

After choosing a task, you will be able to return to the main menu if you enter (0).

1. Load

If you chose Load, the program would open the file named Book.txt and save the directory in the computer memory. Then the program will be able to perform tasks on the directory.

2. Query

If you chose Query, the program will ask you to input last name and first name of the contact you are searching for and will give you the details about that contact if it exists in the directory.

```
Choose an option: 2
Enter Last Name To Search for contacts or type (0) to return: Shams
User Not Found
Enter Last Name To Search for contacts or type (0) to return: B

Contact 1:
The First Name Is: H
The Date Of Birth Is 2/1/2001
Address Is: 20 albert Street
Email Is: PreBot@gmail.com
Phone number Is: 0123455153
```

3. ADD.

If you choose ADD, the program will give you field by field detail for you to enter, after all the required information is filled CORRECTLY, the program will add the contact to the directory in the memory.

```
Choose an option: 3

Enter contact to be added:
Enter 0 to leave the function
Last name: Shams
First name: Mazen
Date of birth:
Day ?: 1
Month ?: 1
Year ?: 2001
Address: Type address here
Phone number: 01158425511
E-mail: mi.zo7274@gmail.com
CONTACT ADDED
```

Program would return error messages if the details entered are not correct.

4. Delete.

If you chose Delete, the program will ask you for the first name and last name of the contact you wish to delete, and the program will delete the contact you searched for if it exists in the directory.

```
Choose an option: 4
enter the last name which you want to delete or type (0) to return: shams
enter the first name which you want to delete: mazen
CONTACT DELETED
```

5.Modify.

If you chose Modify, the program will ask you to enter the last name of the contact you wish to modify, if it does not exist, an error message will be returned.

```
Enter the last name of the contact you want to modify or type (0) to exit: shams
There is no contact with this last name
```

If the user's input last name is repeated, the user will be given the option to choose which contact they want to edit.

```
Enter the last name of the contact you want to modify or type (0) to exit: B
1.Last name: B First name: H
2.Last name: B First name: M
3.Last name: B First name: J
^^^^Choose a contact from the above list^^^^:
```

Choose which contact you want to edit by typing a number from (1 to ...) depending on how many contacts have the same last name.

After the contact is selected, choose which detail you want to modify (enter a number from 1 to 6) and enter the new details to update the directory.

```
1Which field do you want to modify?
1.Last name
2.First name
3.Date of birth
4.Address
5.Phone number
6.Email
7.Quit
Choose an option: 5
Enter the new phone number: 01354256357
```

Enter (7) when you are done modifying.

6.Print

If you chose 6, the program would ask you for which sorting you wish to see your directory.

```
Choose an option: 6
Print the directory sorted by:

1.Sorted by last name
2.Sorted by date of birth
0.To exit:
Choose 0, 1 or 2:
```

Enter (1) to see the directory printed by the last name alphabetically.

Enter (2) to see the directory printed by date of birth.

```
Choose 0, 1 or 2:2

Sorted by date of birth:

1.Sort from youngest to oldest
2.Sort from oldest to youngest
0.exit
choose 1, 2 or 0:
```

Enter (1) to see the directory printed from youngest to oldest.

Enter (2) to see the directory printed from oldest to youngest.

Enter (0) to return to the main menu.

7. Save.

If you chose to save, any changes done to the directory will be saved to the Book.txt file.

```
1.LOAD
2.Query
3.ADD
4.DELETE
5.MODIFY
6.PRINT
7.SAVE
8.Quit
Choose an option: 7
ALL CHANGES HAVE BEEN SAVED
```

Enter (8) to exit the program.