```
/*********************************/
```
Test 1: Testing for wrong argument

$ ./project1 wrong
Program shows information how to get the information about the possible arguments.

Example:
Bad operands
Try '--help' flag for more information.

```
/*********************************/
```
Test 2: Testing --help argument

$ ./project1 --help
Program shows a list of possible arguments.

Example:

 -d, debug
    In this mode, the name of all functions
    and the passed parameters will be displayed.

 -v, --version
    output version information and exit

 -h, --help
    display this help and exit

```
/*********************************/
```
Test 3: Start the program by typing the program name with no arguments

$ ./project1

A menu list would be displayed including the number of available records based on what has been imported from the file. Whenever either no input file is available or the list is empty, the "The list is empty" message will be displayed.
Since we have just started to fill in the list, "The list is empty" would be displayed at the first time we start using the program.

```
/*********************************/
```
Test 4: The add option is chosen and the necessary fields are entered by user.

Entered values are:
Name: Ehsan Kourkchi

Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795

/**********************************/
Test 5: Program asks whether the input information is correct by
displaying the information and displaying the confirmation menu.

/**********************************/
Test 6: Confirm that the entered information is correct.
The message "The record is added" would be displayed and user prompts
to the main menu again.

/**********************************/
Test 7: The option "Print all contacts" would be chosen.
The list containing the just entered field must be displayed followed
by the main menu waiting for user for the next command. The displayed
field must be exactly the same as what have been entered as the first
field.

/**********************************/
Test 8: The option "print a contact" would be chosen. Here, user is
asked to enter the name of the contact to be displayed.

Enter "Peter" as the name which does not exist in the list. Program
warns the user that "the contact is not available in the list" and
after that shows the main menu asking for another command.

/**********************************/
Test 9: The option "print a contact" would be chosen again.

Enter "Ehsan Kourkchi" which is the same as the first contact that
already added into the list as its first field.

Program searches through the list, finds the field and displays the
information as

Name: Ehsan Kourkchi
Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795

After that program displays the main menu and waiting for user to
enter another command.

/**********************************/

Test 10: The "modifying a contact" would be chosen in this step.

Program asks user to enter the contact name for which the data would be modified. Enter "John" as a contact which is not available but user wants to modify it.

Program show a warning message for user indicating the "There is no contact with no such name in this list". Then program displays the main menu and asks user for the next operation.

/*********************************/
Test 11: The "modifying a contact" would be chosen again.

This time "Ehsan Kourkchi" would be entered as the field name user wants to modify.

Program asks user to enter all new fields. This new information will be entered.

Name: John Ninja
Address: 1295 Woodlawn Dr
Hilo, HI 96822
Yearofbirth: 1980
Telno: (808) 630 3685

Once user is done with the entered information, the "Contact details was modified" message would be displayed.

Main menu will be displayed waiting for user for next operation.

/*********************************/
Test 12: The option "Print all contacts" would be chosen to make sure that the record is actual
modified.

The displayed modified field must be:
Name: John Ninja
Address: 1295 Woodlawn Dr
Hilo, HI 96822
Yearofbirth: 1980
Telno: (808) 630 3685

Main menu will be displayed waiting for user for next operation.

/*********************************/
Test 13: "Remove a contact" option will be chosen in this step.

The name "Evan" will be entered as the a non-existing wrong name.

Program return an warning telling user that "There is no record with such name."

The main menu would be displayed waiting for user to enter a new command.

/********************************/
Test 14: "Remove a contact" option will be chosen again in this step.

The name "John Ninja" will be entered as the name of the field which exists now.

Program will find the recently modified field and asks the user confirmation if he/she is
really willing to remove the file.

/********************************/
Test 15: The "no" option would be chosen. No action would be done. The message "No record was
removed." will be displayed followed by the main menu waiting for the suer command.

/********************************/
Test 16: "test 14" will be repeated followed by a "yes" answer to confirm the removing process. The record would be removed followed by this message for the user "The desired record was deleted."

The main menu would be displayed afterward.

/********************************/
Test 17: The option "Print all contacts" is chosen here to see whether the single record in the
database has been really removed.

The message "The list is empty" must be displayed followed by the main menu.

/********************************/
Test 18: The add option is chosen and the necessary fields are entered by user. In this step five few records will be added. Each time any record is added, the option "Print all contacts" will be used to confirm that the record is actually added to the list.

The following sample records are used at this step.

```
--------------------------
Name: Ehsan Kourkchi
Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795
--------------------------
--------------------------
Name: Sean Bolton
Address: 1285 Aloha St.
Hilo,
Hawaii HI 18962
Yearofbirth: 1984
Telno: (808) 152 3684
--------------------------
--------------------------
Name: Ehsan Kourkchi
Address: 26, Reza Dousti Alley,
Vahidiyeh St., Nezam Abad
Tehran, Iran
16436-73611
Yearofbirth: 1979
Telno: (307) 416 6375
--------------------------
--------------------------
Name: Sarah McLauren
Address: 6381, Grand Canyon Ave.,
Washaki Center,
Laramie, WY 16395
Yearofbirth: 1981
Telno: (532) 123 8563
--------------------------
--------------------------
Name: Francoise Holande
Address: 1365, Sean Loran St.,
Molin Rouge,
Paris, France
1985634
Yearofbirth: 2002
Telno: +91 326 785362 365
--------------------------
```

The first and the second records have the same name field (i.e. "Ehsan Kourkchi"), in order to test "find" and "delete" functions.

```
/********************************/
```
Test 19: Testing if the program can find multiple records with the

same name field.
The option "Print a contact" will be chosen in this step.

Program asks user to enter the contact name that will be displayed.
Enter "Ehsan Kourkchi" as the record name that would be displayed.

Program finds two following records and display them.

```
--------------------------
Name: Ehsan Kourkchi
Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795
--------------------------
--------------------------
Name: Ehsan Kourkchi
Address: 26, Reza Dousti Alley,
Vahidiyeh St., Nezam Abad
Tehran, Iran
16436-73611
Yearofbirth: 1979
Telno: (307) 416 6375
--------------------------
```

The main menu would be displayed asking the user to enter the command.

/********************************/
Test 20: Testing if program is capable to remove the same records with the same name field.

The option "Remove a contact" will be chosen in this step.

Program asks user to enter the contact name that will be removed.
Enter "Ehsan Kourkchi" as the record name that would be removed.

Two records with field "Ehsan Kourkchi" would be displayed asking the user to confirm whether
or not to remove the records.

A: choose "no" and not confirm the removing. The program must show the main menu.
B: Repeat the "test 20" again exactly with the same input and choose "yes" to confirm the removing
process.

The program must remove these two records and inform the user "2

records was removed". If more than two records were the same, the exact number of the removed records must be displayed.

Main menu is displayed waiting for the user.

/*********************************/
Test 21: Testing if the removed records are actually removed.

Choose the option "Print all contacts" to see the results.
The following records must be displayed:

Name: Sean Bolton
Address: 1285 Aloha St.
Hilo,
Hawaii HI 18962
Yearofbirth: 1984
Telno: (808) 152 3684

Name: Sarah McLauren
Address: 6381, Grand Canyon Ave.,
Washaki Center,
Laramie, WY 16395
Yearofbirth: 1981
Telno: (532) 123 8563

Name: Francoise Holande
Address: 1365, Sean Loran St.,
Molin Rouge,
Paris, France
1985634
Yearofbirth: 2002
Telno: +91 326 785362 365

The main menu of the program would be displayed.

/*********************************/
Test 22: Testing the reading and writing to a file.

Choose "Quit" option. The program must be ended with the following a message for user indicating
that the database has been saved.

/*********************************/
Test 23: Reopenning the program by typing:

```
$ ./project1
```

The program must be restarted and inform the user that there are "3" records available in the database.

/*********************************/
Test 24: Testing whether all records are loaded by choosing "Print all contacts". The same records
as what you got in "test 21" must be displayed.

The main menu must be displayed at the end waiting for user to enter new command.

/*********************************/
Test 25: Removing a single record from a list with more than one record.

Choose "Remove a contact" and enter "Sarah McLauren" as the name of the record that must be removed.

The following record must be displayed asking the user to confirm the removing.

```
--------------------------
Name: Sarah McLauren
Address: 6381, Grand Canyon Ave.,
Washaki Center,
Laramie, WY 16395
Yearofbirth: 1981
Telno: (532) 123 8563
--------------------------
```

Confirm to remove the chosen record. Program will inform the user that "the record was successfully removed."
and displays the main menu afterward.

/*********************************/

Test 26: Choose "Print all records" to see whether the selected record has been removed.
The following records must be displayed:

```
--------------------------
Name: Sean Bolton
Address: 1285 Aloha St.
Hilo,
Hawaii HI 18962
```

Yearofbirth: 1984
Telno: (808) 152 3684

Name: Francoise Holande
Address: 1365, Sean Loran St.,
Molin Rouge,
Paris, France
1985634
Yearofbirth: 2002
Telno: +91 326 785362 365

The main menu would be displayed.

/*********************************/
Test 27: Search and print a single record in a list with more than
one contact.
Choose "Print a contact" and enter "Francoise Holande" as the name of
the record that
should be displayed.

The following record must be displayed:

Name: Francoise Holande
Address: 1365, Sean Loran St.,
Molin Rouge,
Paris, France
1985634
Yearofbirth: 2002
Telno: +91 326 785362 365

The main menu would be displayed afterward.

/*********************************/

Test 28: Modify a record in a single record in a list with more than
one contact.
Choose "Modify a contact" from the menu and enter "Foo" as the name
which does not exist
in the list.

The program must warn the user that "there is no record with such
name." and then displays the
main menu.

```
/**********************************/
```
Test 29: Modify a record in a single record in a list with more than one contact.
Choose "Modify a contact" from the menu and enter "Francoise Holande" as the name of the record that
should be modified.

Enter all new fields and press enter. Use the following information for the modified record.

```
--------------------------
Name: Ehsan Kourkchi
Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795
--------------------------
```

The program must display a message indicating that the record was modified.

```
/**********************************/
```
Test 30: Choose "Print all contacts" to see whether the selected record is modified.

The below information must be displayed followed by the main menu.

```
--------------------------
Name: Sean Bolton
Address: 1285 Aloha St.
Hilo,
Hawaii HI 18962
Yearofbirth: 1984
Telno: (808) 152 3684
--------------------------
--------------------------
Name: Ehsan Kourkchi
Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795
--------------------------
```

```
/**********************************/
```
Test 31: Choose "Add a contact" and add the following contact

```
--------------------------
Name: Ehsan Kourkchi
Address: 26, Reza Dousti Alley,
Vahidiyeh St., Nezam Abad
Tehran, Iran
16436-73611
Yearofbirth: 1979
Telno: (307) 416 6375
--------------------------
```

From the main menu choose "Print all contacts" to see whether the entered information is loaded
into the database.

The following records must be displayed:

```
--------------------------
Name: Sean Bolton
Address: 1285 Aloha St.
Hilo,
Hawaii HI 18962
Yearofbirth: 1984
Telno: (808) 152 3684
--------------------------
--------------------------
Name: Ehsan Kourkchi
Address: 2680 Woodlawn Dr
Honolulu, HI 96822
Yearofbirth: 1980
Telno: (808) 220 6795
--------------------------
--------------------------
Name: Ehsan Kourkchi
Address: 26, Reza Dousti Alley,
Vahidiyeh St., Nezam Abad
Tehran, Iran
16436-73611
Yearofbirth: 1979
Telno: (307) 416 6375
--------------------------
```

The main menu must be displayed at the end. Please note that the second and third field
have the same name field.

/********************************/

Test 32: For modifying a record, user has to enter the name of the contact that would be modified.
If multiple records has the same name field, the first record that have the entered name would
be removed.

Choose "Modify a contact" from the menu and enter "Ehsan Kourkchi" as the name.
For the new information for the modifying record enter:

```
--------------------------
Name: Francoise Holande
Address: 1365, Sean Loran St.,
Molin Rouge,
Paris, France
1985634
Yearofbirth: 2002
Telno: +91 326 785362 365
--------------------------
```

The message "the record was modified" would be displayed. To confirm the modifying process choose
"Print all contacts". You must see that the first record is modified.
So the following records
must be displayed:

```
--------------------------
Name: Sean Bolton
Address: 1285 Aloha St.
Hilo,
Hawaii HI 18962
Yearofbirth: 1984
Telno: (808) 152 3684
--------------------------
--------------------------
Name: Francoise Holande
Address: 1365, Sean Loran St.,
Molin Rouge,
Paris, France
1985634
Yearofbirth: 2002
Telno: +91 326 785362 365
--------------------------
--------------------------
Name: Ehsan Kourkchi
Address: 26, Reza Dousti Alley,
Vahidiyeh St., Nezam Abad
Tehran, Iran
```

16436-73611
Yearofbirth: 1979
Telno: (307) 416 6375

/***********************************/
Test 33: Choose "Quit" from the menu to exit the program. Rerun the program using

$ ./project1

Three records must be loaded. Using "Remove a contact" three times, remove all the records. After
removing each record, use "Print all records" to confirm the removing process.

/************************************/
Test 34: Start the program by typing the program name with "debug" argument

$ ./project1 debug

and go through all "test 3-33" steps again. At the end of each step before the
main menu is displayed, the parameters that has been passed to each function must be displayed.

/************************************/
Test 35: Start the program by typing the program name with "-v" argument

$ ./project1 -v

The version of the program and the copyright (licensing) stuffs must be displayed.

Example:

    database
    version: (ICS212) HW03
    Copyright (C) 2013
    Written by Ehsan Kourkchi

/**********************************
THE END of testing process.
**********************************/