Report on Problem 2:

Files included in assignment:

Source Code, Database csv file, Report.

Datastructres used:

Singly linked list, Arrays(to store data in nodes).

Program outputs:

1. Add operation:

```
:\Users\Abdul\Desktop\programs\assignment 2>run
Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.
You pressed 1.
Please do not exit until current persons data is not entered completly.
Note use Camel case only. i.e. first letter capital and rest small. eg. = 'Hi' 'These' 'Are' 'Camel' 'Case'
Enter the Adhar number/Social security number of the person: 863575259733
Enter the name of person. : Vishwanathan Anand
Enter the fathers name. : Ravi Prakash Anand
Enter the mothers name. : Geeta Rani
Enter the Rank/position/occupation. : Grand Master
Enter the department of work palce/Company. : Goverment of India
Enter the date of joining. : 25/08/2008
Enter the house no. of the person : #782
Enter the streetname of the person. : Phase 5
Enter the city of the person. : Delhi
Enter the state of the person. : Delhi
Enter the country of residense. : India
Enter the pin code of the area. : 672352
Thank you the data base has been updated.
Open the databse at C:\Users\Abdul\Desktop\programs\assignment 2\db.csv
```

*Before Add:

	Α	В	C	D	Е	F	G	Н	I	J	K	L	M
1	8E+09	Vageta	Saitama	Hinata	Major	Japanese Army	#####	#47	Chue line	Tokyo	Kanagawa	Japan	163363
2	1E+09	Ritik Sharma	Akash Sharma	Naina Dev	Student	C.C.E.T.	#####	#435	Sector 15-	Chandigar	Chandigarl	India	160036
3	2E+09	Smokey Nagata	Goku Han	Sakuro Hai	Mechanic	Top Speed Corpo	#####	#628	Yamashita	Yokohama	Kanagawa	Japan	414532
4	6E+09	Xavi Harnandez	Raul Garcia	Emma W.	Center Mid	Football Club Bar	#####	#4323	Camp Nou	Barcelona	Catalonia	Spain	948221
5	8E+09	Andres Iniesta	Johann Cruyf	Margot Tr	Central Atta	Football Club Bar	#####	#543	Malasana	Castella	Madrid	Spain	951648
5	5E+09	Jack Dawson	Dwayen Johns	Rose Marr	Stock Broke	Berkshire Hathw	#####	#865	Wall Stree	New York	Manhatter	United Sta	28486
7	7E+09	Karoshi Nagasa	Itachi Uchicha	Umiko ma	Programme	Forza Inc.	#####	#4678	Mount Fuj	Yokohama	Kanagawa	Japan	463728
3	6E+09	Dilip Kumar	Kishor Kumar	Zeenat Am	Actor	Bollywood	#####	#325	Shivaji Stre	Mumbai	Maharasht	India	362735
9													
0													
1													

*After Add

	Α	В	С	D	Е	F	G	Н	- 1	J	K	L	M
1	8.5E+09	Vageta	Saitama	Hinata	Major	Japanese A	######	#47	Chue line	Tokyo	Kanagawa	Japan	163363
2	1.4E+09	Ritik Sharma	Akash Sha	Naina Dev	Student	C.C.E.T.	######	#435	Sector 15-	Chandigar	Chandigar	India	160036
3	1.7E+09	Smokey Nagata	Goku Han	Sakuro Hai	Mechanic	Top Speed	######	#628	Yamashita	Yokohama	Kanagawa	Japan	414532
4	6.1E+09	Xavi Harnandez	Raul Garci	Emma W.	Center Mid Field	Football C	######	#4323	Camp Nou	Barcelona	Catalonia	Spain	948221
5	8.2E+09	Andres Iniesta	Johann Cru	. Margot Tr	Central Attacking	Football C	######	#543	Malasana	Castella	Madrid	Spain	951648
6	4.7E+09	Jack Dawson	Dwayen Jo	Rose Marr	Stock Broker	Berkshire	######	#865	Wall Stree	New York	Manhatte	United Sta	28486
7	6.8E+09	Karoshi Nagasaki	Itachi Uchi	i Umiko ma	Programmer	Forza Inc.	######	#4678	Mount Fuj	Yokohama	Kanagawa	Japan	463728
8	6.5E+09	Dilip Kumar	Kishor Kun	Zeenat Am	Actor	Bollywood	######	#325	Shivaji Stre	Mumbai	Maharash	India	362735
9	8.6E+11	Vishwanathan Anand	Ravi Praka	Geeta Ran	Grand Master	Govermen	######	#782	Phase 5	Delhi	Delhi	India	672352
10													
11													
40													

2. Delete operation:

Initial database: // Deleting Mr. Jack Dawson

	Α	В	С	D	Е	F	G	Н	I	J	K	L	М
1	8.5E+09	Vageta	Saitama	Hinata	Major	Japanese A	######	#47	Chue line	Tokyo	Kanagawa	Japan	163363
2	1.4E+09	Ritik Sharma	Akash Sha	Naina Dev	Student	C.C.E.T.	######	#435	Sector 15-	Chandigar	Chandigar	India	160036
3	1.7E+09	Smokey Nagata	Goku Han	Sakuro Hai	Mechanic	Top Speed	######	#628	Yamashita	Yokohama	Kanagawa	Japan	414532
4	6.1E+09	Xavi Harnandez	Raul Garci	Emma W.	Center Mid Field	Football C	######	#4323	Camp Nou	Barcelona	Catalonia	Spain	948221
5	8.2E+09	Andres Iniesta	Johann Cru	. Margot Tr	Central Attacking	Football C	######	#543	Malasana	Castella	Madrid	Spain	951648
6	4.7E+09	Jack Dawson	Dwayen Jo	Rose Marr	Stock Broker	Berkshire	######	#865	Wall Stree	New York	Manhatte	United Sta	28486
7	6.8E+09	Karoshi Nagasaki	Itachi Uchi	i Umiko ma	Programmer	Forza Inc.	######	#4678	Mount Fuj	Yokohama	Kanagawa	Japan	463728
8	6.5E+09	Dilip Kumar	Kishor Kun	Zeenat Am	Actor	Bollywood	######	#325	Shivaji Stre	Mumbai	Maharash	India	362735
9	8.6E+11	Vishwanathan Anand	Ravi Praka	Geeta Ran	Grand Master	Govermen	######	#782	Phase 5	Delhi	Delhi	India	672352
10													
11													

Program:

```
Microsoft Windows [Version 10.0.19042.1348]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Abdul\Desktop\programs\assignment 2>run

Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.

2

You pressed 2.

Enter the Adhar number/Social security number of person to be deleted.
4684369429

Record deleted successfully. Check on database location: C:\Users\Abdul\Desktop\programs\assignment 2\db.csv

C:\Users\Abdul\Desktop\programs\assignment 2>
```

Final Database:

	Α	В	C	D	Е	F	G	Н	I	J	K	L	M
1	8E+09	Vageta	Saitama	Hinata	Major	Japanese A	####	#47	Chue line	Tokyo	Kanagawa	Japan	163363
2	1E+09	Ritik Sharma	Akash Shai	Naina Dev	Student	C.C.E.T.	####	#435	Sector 15-	Chandigar	Chandigar	India	160036
3	2E+09	Smokey Nagata	Goku Han	Sakuro Ha	Mechanic	Top Speed	####	#628	Yamashita	Yokohama	Kanagawa	Japan	414532
4	6E+09	Xavi Harnandez	Raul Garci	Emma W.	Center Mid	Football C	l ####	#4323	Camp Nou	Barcelona	Catalonia	Spain	948221
5	8E+09	Andres Iniesta	Johann Cru	Margot Tr	Central At	Football C	l ####	#543	Malasana	Castella	Madrid	Spain	951648
6	7E+09	Karoshi Nagasaki	Itachi Uchi	Umiko ma	Programm	Forza Inc.	####	#4678	Mount Fuj	Yokohama	Kanagawa	Japan	463728
7	6E+09	Dilip Kumar	Kishor Kun	Zeenat Am	Actor	Bollywood	l ####	#325	Shivaji Str	Mumbai	Maharasht	India	362735
8	9E+11	Vishwanathan Anand	Ravi Praka	Geeta Ran	Grand Mas	Govermen	####	#782	Phase 5	Delhi	Delhi	India	672352
9													
10													
11													

3. Search Operation:

```
C:\Users\Abdul\Desktop\programs\assignment 2>run
Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.
You pressed 3.
Enter the adhar no./Social security no. of person: 6064081606
Adhar no./Social Security no. : 6064081606
Name: Xavi Harnandez
Fathers name: Raul Garcia
Mothers name: Emma W.
Rank/Position/Occupation: Center Mid Fielder
Department/Company: Football Club Barcelona
Date of joining : 18-07-2008
House no. : #4323
Street name: Camp Nou
City: Barcelona
State: Catalonia
Countary: Spain
Pin : 948221
C:\Users\Abdul\Desktop\programs\assignment 2>
```

4. Display Citizens

From a particular city

```
C:\Users\Abdul\Desktop\programs\assignment 2>run
Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.
You pressed 4.
Press 'c' to search by city, 's' to search by state, 'x' to search by country: c
You entered c
Enter the city(people of that city will be displayed)
Note: use Camel case letters only
i.e. first letter capital, rest small. eg.=Yokohama
-> Yokohama
Adhar no./Social Security no. : 1684264648
Name: Smokey Nagata
Fathers name: Goku Han
Mothers name: Sakuro Haruno
Rank/Position/Occupation: Mechanic
Department/Company: Top Speed Corporation
Date of joining : 29-05-2002
House no. : #628
Street name: Yamashita
City: Yokohama
State: Kanagawa
Countary: Japan
Pin : 414532
Adhar no./Social Security no. : 6832658732
Name: Karoshi Nagasaki
Fathers name: Itachi Uchicha
Mothers name: Umiko masaka
Rank/Position/Occupation: Programmer
Department/Company: Forza Inc.
Date of joining : 10-06-2015
```

House no. : #4678 Street name: Mount Fuji Area City: Yokohama State: Kanagawa Countary: Japan Pin : 463728 C:\Users\Abdul\Desktop\programs\assignment 2>

Displaying by state:

```
C:\Users\Abdul\Desktop\programs\assignment 2>run
Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.
You pressed 4.
Press 'c' to search by city, 's' to search by state, 'x' to search by country: s
You entered s
Enter the State (People of that state will be displayed)
Note: use Camel case letters only
i.e. first letter capital, rest small. eg.= Kanagawa
-> Catalonia
Adhar no./Social Security no. : 6064081606
Name: Xavi Harnandez
Fathers name: Raul Garcia
Mothers name: Emma W.
Rank/Position/Occupation: Center Mid Fielder
Department/Company: Football Club Barcelona
Date of joining : 18-07-2008
House no. : #4323
Street name: Camp Nou
City: Barcelona
State: Catalonia
Countary: Spain
Pin : 948221
Adhar no./Social Security no. : 8194832500
Name: Andres Iniesta
Fathers name: Johann Cruyf
Mothers name: Margot Trumph
Rank/Position/Occupation: Central Attacking Midfielder
Department/Company: Football Club Barcelona
Date of joining : 15-02-2009
House no. : #543
Street name: Malasana
City: Castella
State: Catalonia
Countary: Spain
Pin : 951648
```

C:\Users\Abdul\Desktop\programs\assignment 2>

Displaying by country:

```
C:\Users\Abdul\Desktop\programs\assignment 2>run
Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.
You pressed 4.
Press 'c' to search by city, 's' to search by state, 'x' to search by country: x
You entered x
Enter the Country (People of that country will be displayed)
Note: use Camel case letters only
i.e. first letter capital, rest small. eg.= India
> India
Adhar no./Social Security no. : 1361616211
Name: Ritik Sharma
Fathers name: Akash Sharma
Mothers name: Naina Devi
Rank/Position/Occupation: Student
Department/Company: C.C.E.T.
Date of joining : 15-09-2006
House no. : #435
Street name: Sector 15-D
City: Chandigarh
State: Chandigarh
Countary: India
Pin : 160036
Adhar no./Social Security no. : 6473438438
Name: Dilip Kumar
Fathers name: Kishor Kumar
Mothers name: Zeenat Aman
Rank/Position/Occupation: Actor
Department/Company: Bollywood
Date of joining : 11-11-1962
House no. : #325
```

5. Update a record:

*before update

```
You pressed 3.
Enter the adhar no./Social security no. of person: 6832658732
Adhar no./Social Security no. : 6832658732
Name: Karoshi Nagasaki
Fathers name: Itachi Uchicha
Mothers name: Umiko masaka
Rank/Position/Occupation: Programmer
Department/Company: Forza Inc.
Date of joining : 10-06-2015
House no. : #4678
Street name: Mount Fuji Area
City: Yokohama
State: Kanagawa
Countary: Japan
Pin : 463728
C:\Users\Abdul\Desktop\programs\assignment 2>
```

*After update:

```
You pressed 3.
Enter the adhar no./Social security no. of person: 6832658732
Adhar no./Social Security no. : 6832658732
Name: Gohan
Fathers name: Goku
Mothers name: Bulma
Rank/Position/Occupation: Leughtinent
Department/Company: Indian Army
Date of joining : 15/05/2002
House no. : #8493
Street name: Sector 25-A
City: Chandigarh
State: Chandigarh
Countary: India
Pin : 162266
C:\Users\Abdul\Desktop\programs\assignment 2>
```

Program:

```
C:\Users\Abdul\Desktop\programs\assignment 2>run
Enter 1 to Add a record.
Enter 2 to Delete a record.
Enter 3 to Search a Record.
Enter 4 for Displaying people belonging to particular city/State/Country.
Enter 5 to Update a record.
You pressed 5.
Enter the Adhar number/Social security number of person to update.
6832658732
Please do not exit until current persons data is not entered completly.
Note use Camel case only. i.e. first letter capital and rest small. eg. = 'Hi' 'These' 'Are' 'Camel' 'Case'
Enter the name of person. : Gohan
Enter the fathers name. : Goku
Enter the mothers name. : Bulma
Enter the Rank/position/occupation. : Leughtinent
Enter the department of work palce/Company. : Indian Army
Enter the date of joining. : 15/05/2002
Enter the house no. of the person : #8493
Enter the streetname of the person. : Sector 25-A
Enter the city of the person. : Chandigarh
Enter the state of the person. : Chandigarh
Enter the country of residense. : India
Enter the pin code of the area. : 162266
```

How to use the program:

Step 1:

Download both the files provided.

Step 1:

Open the source code and change the path variable (on line 7) to the address of db.csv file provided. (Note: use " \\ " instead of " \ ")

Compile the source code.

Step 2:

Open the csv with notepad and check if the csv file is in the format,

```
data 1,data 2,data 3, ... ,data 10 "\n"

data 11,data 12,data 13, ... ,data 20 "\n"

.

.

data n, data (n+1), ... , data m "\n"
```

i.e. a new line character after the last data field in the last line.

Note: program wont know if a record is present until it sees a (next line char (\n)).

Step 3:

Run the executable. And perform the required operation

Conclusion:

Advantages of linked list over arrays.

- Linked list is a more versatile data structure in that we can resize it, and no
 responsibility is given to the user to change the no. of (people/students)
 in the data base each time a record is added or removed.
- Linked list can be customized to become FILO (first in last out)
 by inserting at the beginning and accessing from the front.
 or FIFO (first in first out) by inserting at the end and accessing from front.

Disadvantages of using a linked list over array

- 1. Random access in linked list is not possible, although we can have a pseudo random access by calling a function which takes input the data field of the node, transverses the list and returns the required node. But in camparison arrays are much simple.
- 2. It takes more space (to store the next pointer). And accessing data Is more complicated.