Problem B: Storing Bank Accounts in Random Access Files

(25%, related to Lab 14)

Problem Description

Modify ClientData class given in Fig. 17.2 and Fig. 17.3 to include a private data member of **char cityName[16]**. You should develop the following functions:

- **void createRandomFile(ifstream &, fstream &, const int)** reads a formatted data file named **inputFilePB.dat** and creates a random access file **binaryFilePB.dat**. Each line in inputFilePB.dat contains information for creating an object (i.e. an account) of ClientData which will be stored in binaryFilePB.dat as a record. Each record in inputFilePB.dat has five fields in order of account number, last name, city name, balance. These five fields correspond to the five data members of the modified ClientData class. The first parameter in this function is the file handle of inputFilePB.dat. The second parameter is the file handle of binaryFilePB.dat. The third parameter specifies the number of accounts (records) that should be stored in binaryFilePB.dat. Here, it must be set to 100.
- **void printAllRecords(fstream &)** prints all the records on the monitor. The parameter should be the file handle of **binaryFilePB.dat**. Each record should be printed on a line. Only non-empty records are printed. Its format is just like that given in the example output.
- Other functions dealing with the added private data member **cityName** should be either modified or newly created accordingly to produce the desired output.

The main() function in Fig. 17.7 should be modified first to call createRandomFile(ifstream &, fstream &, const int) to create the random access file binaryFilePB.dat. Then, call printAllRecords(fstream &) to print all non-empty records in binaryFileFB.data. This part of code should be placed before line 33 on page 738. The code of main() after line 33 on page 738 should not be changed. Then, you should perform the following transactions:

- Update account 53 by adding 92 to its balance.
- Add a new account. Its account number is 100. Its last name is Lin. Its first name is Rung-Bin. Its city name is Kaohsiung. Its balance is 20000.
- Delete account 77.
- Delete account 77 again.

After performing the above transactions, call **printAllRecords(fstream &)** to print all the records in **binaryFile PB.dat**.

Requirements:
- Class definitions can only be modified as specified above. Related member functions can be added as needed.
- main() function should be modified as specified above.
- **The contents of output should be exactly the same as that given in the example output.** The fields among lines should be aligned well for readability, but may not be exactly the same as that given in the example output.

Hints for solving the problems:
- At some places in your code, you should use a statement just like that in line 58 on page 739 to reset eof (end of file) flag. This is quite important if the file has been read to the end and now it has to be read again from the beginning. Without doing so, the file content just cannot be read again into your program.
- The code in Fig. 17.2, Fig. 17.3 and Fig. 17.7 is given.

Input:

As that given in a file named inputFilePB.dat. Also some inputs come from keyboard for choosing transactions being performed by a user.

Example Output:

```
Account     Last Name       First Name City Name            Balance
1           Bach            Han-X      Seattle             25843.00
2           Subert          Jane-VIII  Paris               27895.00
3           Bach            Vick-VI    OuterSpaceGalax     32425.00
4           Hamilton        Pey-III    Paris               26954.00
5           Smith           Vick-I     WashingtonDC        10749.00
6           Jhonston        Mary-VII   WashingtonDC        32434.00
7           Jhonston        Berg-X     Minneapolis         18516.00
8           Hamilton        Gord-I     London              19602.00
9           Adams           Vick-X     Paris               26687.00
10          Hamilton        Pey-VII    Kaohsiung           15755.00
11          Morzart         Berg-III   Paris               20247.00
14          Hamilton        Jane-II    Kaohsiung           22794.00
17          Morzart         Pey-X      Kaohsiung           29071.00
24          Smith           Mary-II    Kaohsiung           14370.00
25          Hamilton        Pey-II     Minneapolis         21855.00
26          Monteli         Tom-VIII   Minneapolis          1038.00
31          Jhonston        Vick-II    SanFransisco        29806.00
34          Smith           Pey-IX     Kaohsiung           20668.00
35          Adams           Gord-X     Taipei              16124.00
43          Brams           Gord-VI    WashingtonDC        10060.00
44          Jhonston        Berg-VII   London              13859.00
47          Subert          Mary-III   OuterSpaceGalax     13397.00
49          Jhonston        Vick-X     Minneapolis         21615.00
53          Heisenberg      John-VI    WashingtonDC         3108.00
57          Jhonston        Tom-VI     NewYork             24467.00
58          Jhonston        Vick-IX    Taipei              14680.00
60          Heisenberg      Jane-III   Kaohsiung           14891.00
68          Monteli         Will-I     OuterSpaceGalax     23614.00
69          Monteli         Berg-II    OuterSpaceGalax     17561.00
71          Monteli         Pey-VIII   Seattle             18044.00
75          Heisenberg      Will-VI    SanFransisco        18737.00
76          Hamilton        Will-VIII  Seattle             31271.00
77          Morzart         Vick-III   Minneapolis         14658.00
80          Hamilton        Han-X      Seattle             20336.00
86          Heisenberg      Will-IV    Taipei              12586.00
95          Jhonston        Berg-I     OuterSpaceGalax     26725.00

Enter your choice
1 - store a formatted text file of accounts
    called "print.txt" for printing
2 - update an account
3 - add a new account
4 - delete an account
5 - end program
? 2
Enter account to update (1 - 100): 53
53          Heisenberg      John-VI    WashingtonDC         3108.00

Enter charge (+) or payment (-): +92
53          Heisenberg      John-VI    WashingtonDC         3200.00
```

```
Enter your choice
1 - store a formatted text file of accounts
    called "print.txt" for printing
2 - update an account
3 - add a new account
4 - delete an account
5 - end program
? 3
Enter new account number (1 - 100): 100
Enter lastname, firstname, cityname, balance
? Lin Rung-Bin Kaoshiung 20000
New account created Successfully: 100

Enter your choice
1 - store a formatted text file of accounts
    called "print.txt" for printing
2 - update an account
3 - add a new account
4 - delete an account
5 - end program
? 4
Enter account to delete (1 - 100): 77
Account #77 deleted.

Enter your choice
1 - store a formatted text file of accounts
    called "print.txt" for printing
2 - update an account
3 - add a new account
4 - delete an account
5 - end program
? 4
Enter account to delete (1 - 100): 77
Account #77 is empty.

Enter your choice
1 - store a formatted text file of accounts
    called "print.txt" for printing
2 - update an account
3 - add a new account
4 - delete an account
5 - end program
? 5
```

Account	Last Name	First Name	City Name	Balance
1	Bach	Han-X	Seattle	25843.00
2	Subert	Jane-VIII	Paris	27895.00
3	Bach	Vick-VI	OuterSpaceGalax	32425.00
4	Hamilton	Pey-III	Paris	26954.00
5	Smith	Vick-I	WashingtonDC	10749.00
6	Jhonston	Mary-VII	WashingtonDC	32434.00
7	Jhonston	Berg-X	Minneapolis	18516.00
8	Hamilton	Gord-I	London	19602.00
9	Adams	Vick-X	Paris	26687.00
10	Hamilton	Pey-VII	Kaohsiung	15755.00
11	Morzart	Berg-III	Paris	20247.00
14	Hamilton	Jane-II	Kaohsiung	22794.00
17	Morzart	Pey-X	Kaohsiung	29071.00
24	Smith	Mary-II	Kaohsiung	14370.00
25	Hamilton	Pey-II	Minneapolis	21855.00
26	Monteli	Tom-VIII	Minneapolis	1038.00
31	Jhonston	Vick-II	SanFransisco	29806.00
34	Smith	Pey-IX	Kaohsiung	20668.00
35	Adams	Gord-X	Taipei	16124.00
43	Brams	Gord-VI	WashingtonDC	10060.00
44	Jhonston	Berg-VII	London	13859.00
47	Subert	Mary-III	OuterSpaceGalax	13397.00
49	Jhonston	Vick-X	Minneapolis	21615.00
53	Heisenberg	John-VI	WashingtonDC	3200.00
57	Jhonston	Tom-VI	NewYork	24467.00
58	Jhonston	Vick-IX	Taipei	14680.00
60	Heisenberg	Jane-III	Kaohsiung	14891.00
68	Monteli	Will-I	OuterSpaceGalax	23614.00
69	Monteli	Berg-II	OuterSpaceGalax	17561.00
71	Monteli	Pey-VIII	Seattle	18044.00
75	Heisenberg	Will-VI	SanFransisco	18737.00
76	Hamilton	Will-VIII	Seattle	31271.00
80	Hamilton	Han-X	Seattle	20336.00
86	Heisenberg	Will-IV	Taipei	12586.00
95	Jhonston	Berg-I	OuterSpaceGalax	26725.00
100	Lin	Rung-Bin	Kaohsiung	20000.00

Account 77 should not be seen now.