Sabancı University

Faculty of Engineering and Natural Sciences
CS204 Advanced Programming
Spring 2017

Homework 3 – Exam Registry using Doubly Linked Lists

Due: 15/03/2017, Wednesday, 21:00

PLEASE NOTE:

Your program should be a robust one such that you have to consider all relevant programmer mistakes and extreme cases; you are expected to take actions accordingly!

You can NOT collaborate with your friends and discuss solutions. You have to write down the code on your own. Plagiarism will not be tolerated!

Introduction

In this homework, you are asked to implement an exam registry. The registry must use *Doubly Linked List* to store information for students. Moreover, for each student the exam and grade information must be stored in a *Singly Linked List*. Thus, the data structure that you will use is a hybrid one. Your program will be able to get data from a file or from the keyboard depending on the user's choice. Moreover, your program must be able to perform several other operations. We will explain the details in the subsequent sections of this homework specification.

The Program Flow

At the very beginning, the program prompts a menu that contains a list of operations. The menu provides 7 different options and each option can be chosen in any order. When an option is entered, the corresponding operation is performed and then the menu is displayed again. This continues until the user chooses the option to end the program. The menu options and the corresponding operations are explained below.

1. **Load From a File:**

In this option, the program gets input data from a text file. If the user choses this option, the program asks the name of the input file until a correct file name is given and file is opened successfully. The information in the file is organized as rows. In each row, the first entry is the user name of the student (as a string), the second entry is the name of the course (as a string) and the last entry is an integer that represents the grade the student received for the exam. The entries are separated by arbitrary number of blank characters. See Figure 1 below for a sample input file.

The registry will be stored in a data structure. Your program should read each line and modify the data structure by adding the exam to it. Details on the data structure and how to modify it will be given in the upcoming parts of the document.

You may assume that your input file is given in the correct format which means you do not need to perform input checks.

```
mcnulty      CS201   40
stringer       ECON301   80
avon         SPS303     90
bubbles    ENG101      50
omar          LAW404     97
frank       MATH102     30
lester      PSYCH202      70
avon       CS204     75
ziggy        NS101     24
mcnulty        ENG102     50
```

Figure 1. Sample input file

2. **Add student / exam grade:**

In this option, the inputs are taken from the keyboard. The user is asked to enter the user name of the student as well as the name of the course and the exam grade of the student. Then, your program adds these data to your data structure. The details about addition operation will be explained in later sections.

3. **Delete a student:**

This option receives a user name of a student as input from the keyboard. If a student with the given user name exists in the registry (your data structure), then it will be deleted in the following way. Firstly, the exam nodes belonging to this student will be deleted. Then, the node that holds the student itself will be deleted as well and a message will be displayed. If the student does not exist in the registry in the first place, then an appropriate message should be displayed. See sample runs for more clarification.

4. **Display exam grades of a student:**

This option receives a user name of a student as input from the keyboard. If a student with the given user name exists in the registry (your data structure), then the exams of this student will be displayed on the screen. The order of display for the exams is the order of existence in the singly linked list of the exams. If the student does not exist in the registry, then an appropriate message should be displayed. See sample runs for more clarification.

5. **Display exam grades of all students in alphabetical order:**

This option prints out all students in alphabetical order of user names. For each student, all the exams and their grades should be displayed. The order of display for the exams is the order of existence in the singly linked list of the exams for each student. See sample runs for more clarification.

6. **Display exam grades of all students in reverse alphabetical order:**

This option prints out all students in reverse alphabetical order of user names. For each student, all the exams and their grades should be displayed. The order of display for the exams is the order of existence in the singly linked list of the exams for each student. See sample runs for more clarification.

7. **Exit:**

Program terminates when the user chooses this option.

The Data Structure to be Used

In this homework, you must represent students as a *doubly linked list*, and represent exam information as *singly linked list*. As a result, you are given two different node types: one for the linked list that holds the exams, and one for the doubly linked list to hold students.

The node type for the exam is a regular one for singly linked lists with one `next` pointer and two data fields; one string for the course name and one integer for the grade. Partial node `struct` for the exam node is given below.

```
struct examNode
{
      string courseName;
      int grade;
      examNode * next;

      // constructors come here
};
```

The node type to hold student information is the one for the *doubly linked list*. It has one `next` and one `prev` pointers of the same node pointer type. Moreover, it also has a third pointer to point the `head` of the *singly linked list* for the exams. In addition, this node type also keeps a string for the user name of the student. Partial node `struct` for the student node is given below.

```
struct studentNode
{
      string userName;
      examNode * headExamList;
      studentNode * next;
      studentNode * prev;

      // constructors come here
};
```

You are requested to design and implement a class for the *doubly linked list*. Name this class `StudentList`, keep the `head` and `tail` as private data members and perform all operations via the member functions of this class. Partial class definition is given below. You can add some helper functions, if you need to do so. You can copy/paste this class definition and structs given above in a header file. However, you have to implement the member functions in another .cpp file (other than the one includes main) and use them in your main program.

```
class StudentList
{
public:
      StudentList();
      void addExam(string userName, string courseName, int grade);
      void deleteStudent(string userName);
      void printStudent(string userName);
      void printAllAZ();  //alphabetical order display
      void printAllZA();  //reverse alphabetical order display
```

```
    void deleteAll();  //to deallocate all dynamic data

private:
    studentNode * head;
    studentNode * tail;

    // any helper functions you see necessary
    // ...
};
```

<u>No</u> other multiple data containers (built-in array, dynamic array, vector, matrix, 2D array, etc.) can be used.

Figure 2 depicts the data structure that you will use in this homework. As seen in the figure, a doubly linked list will be used to allocate the student data and a singly linked list will be used to store the exams.

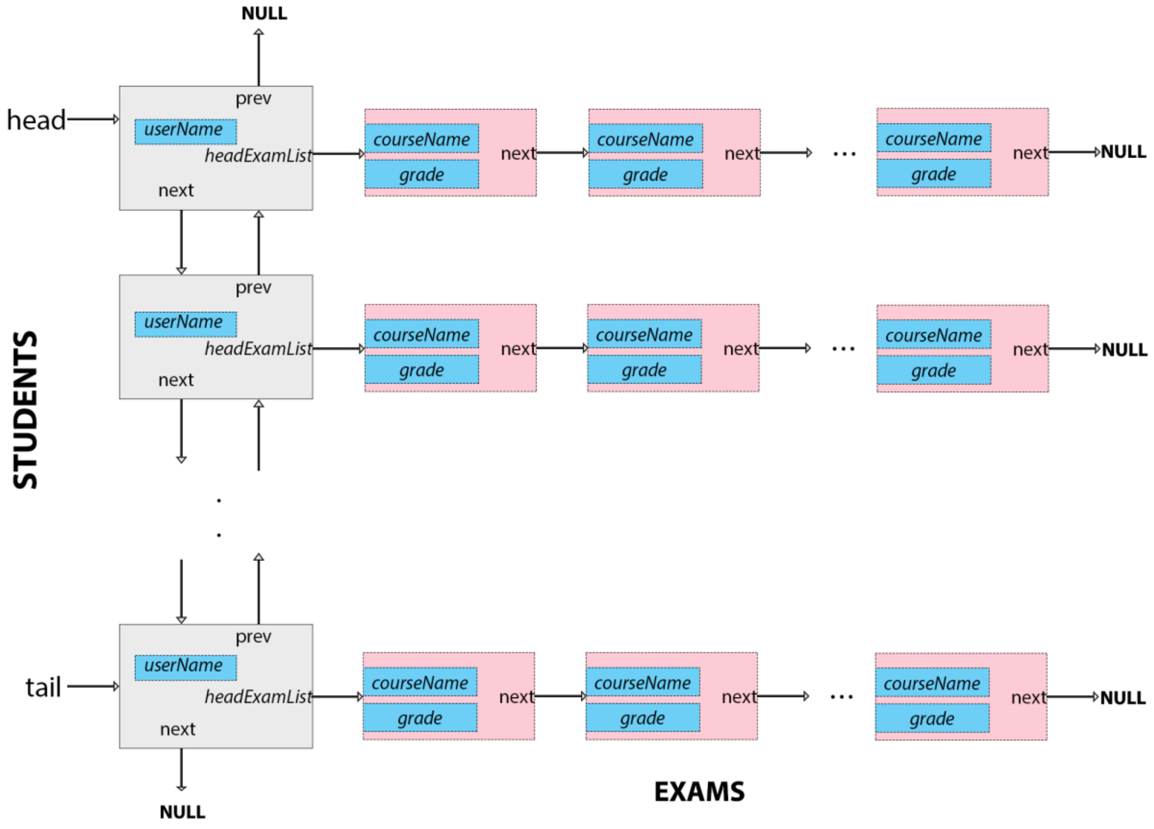

Figure 2. The data structure

Addition and Deletion of Data to the Registry (Data Structure)

In the Students list, there cannot be multiple nodes with the same user name. When a new record is about to be added to the registry (either by reading from file or from the keyboard), you must first check whether given user name exists in the registry. If the user name does not exist, then you need to insert a new student node to the Students list. You have to keep the Student list in alphabetical order all the time and this insertion must be at a proper place so that after the insertion the list remains sorted. After the insertion of the new student node, the exam data is added to the corresponding exam list of that student as the first element. If there is already a node with the given user name in the Students list, i.e. if the student is already in the registry, then you must append the exam information to the end of the exams list of this existing student. That means, the exam lists need not be kept in any order; all additions are done to the end of the corresponding list. For all data additions, you have to display an appropriate message as exemplified in the sample runs section below.

Whenever a student node needs to be deleted, you must deallocate all the exam nodes belonging to the student before deallocating the student node itself.

Moreover, you must deallocate all dynamic memory before your program terminates. You have to perform this by implementing and calling `deleteAll` member function of the class.

Sample Runs

Sample runs are given below, but these are not comprehensive, therefore you have to consider **all possible cases** to get full mark.

The sample input files are provided in the .zip package of this homework.

File: exams1.txt

```
mcnulty      CS201    40
stringer       ECON301   80
avon         SPS303     90
bubbles    ENG101      50
omar           LAW404     97
frank       MATH102     30
lester      PSYCH202      70
avon       CS204     75
ziggy        NS101     24
mcnulty        ENG102     50
```

Sample Run 1:

```
Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
```

```
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
5

Student list is empty.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
1

Enter the name of the file
exam.txt

Error: Could not open the file exam.txt

Enter the name of the file
exams.txt

Error: Could not open the file exams.txt

Enter the name of the file
exams1.txt

A new student with user name mcnulty has been added.
Exam for CS201 with grade 40 is added for mcnulty
A new student with user name stringer has been added.
Exam for ECON301 with grade 80 is added for stringer
A new student with user name avon has been added.
Exam for SPS303 with grade 90 is added for avon
A new student with user name bubbles has been added.
Exam for ENG101 with grade 50 is added for bubbles
A new student with user name omar has been added.
Exam for LAW404 with grade 97 is added for omar
A new student with user name frank has been added.
Exam for MATH102 with grade 30 is added for frank
A new student with user name lester has been added.
Exam for PSYCH202 with grade 70 is added for lester
Exam for CS204 with grade 75 is added for avon
A new student with user name ziggy has been added.
Exam for NS101 with grade 24 is added for ziggy
Exam for ENG102 with grade 50 is added for mcnulty
File has been processed.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
```

```
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
4
Please enter the user name of the student
mcnulty

mcnulty
-------------------
CS201: 40
ENG102: 50



Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
6

Printing all students in reverse alphabetical order.
ziggy
-------------------
NS101: 24

stringer
-------------------
ECON301: 80

omar
-------------------
LAW404: 97

mcnulty
-------------------
CS201: 40
ENG102: 50

lester
-------------------
PSYCH202: 70

frank
-------------------
MATH102: 30

bubbles
-------------------
ENG101: 50

avon
-------------------
SPS303: 90
```

```
CS204: 75


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
5

Printing all students in alphabetical order.
avon
-------------------
SPS303: 90
CS204: 75

bubbles
-------------------
ENG101: 50

frank
-------------------
MATH102: 30

lester
-------------------
PSYCH202: 70

mcnulty
-------------------
CS201: 40
ENG102: 50

omar
-------------------
LAW404: 97

stringer
-------------------
ECON301: 80

ziggy
-------------------
NS101: 24


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
```

```
7. Exit
Your choice:
2
Please enter the user name of the student:
stringer
Please enter the name of the course:
CS204
Please enter the grade[0..100]
75
Exam for CS204 with grade 75 is added for stringer

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
4
Please enter the user name of the student
stringer

stringer
-------------------
ECON301: 80
CS204: 75



Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
frank

Student frank has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
```

```
6

Printing all students in reverse alphabetical order.
ziggy
-------------------
NS101: 24

stringer
-------------------
ECON301: 80
CS204: 75

omar
-------------------
LAW404: 97

mcnulty
-------------------
CS201: 40
ENG102: 50

lester
-------------------
PSYCH202: 70

bubbles
-------------------
ENG101: 50

avon
-------------------
SPS303: 90
CS204: 75


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
7
Exiting..
Press any key to continue . . .
```

File: exams2.txt

```
bruce      ACC101     67
rachel      FIN303  45
alfred    LIT403     88
harvey       MATH301    90
joker         CS201     74
gordon       ECON201      87
```

Sample Run 2:

```
Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
4
Please enter the user name of the student
bruce

Student does not exist in the list.


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
2
Please enter the user name of the student:
bruce
Please enter the name of the course:
EE201
Please enter the grade[0..100]
80
A new student with user name bruce has been added.
Exam for EE201 with grade 80 is added for bruce

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
```

```
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
4
Please enter the user name of the student
bruce

bruce
-------------------
EE201: 80



Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
1

Enter the name of the file
exams2.txt

Exam for ACC101 with grade 67 is added for bruce
A new student with user name rachel has been added.
Exam for FIN303 with grade 45 is added for rachel
A new student with user name alfred has been added.
Exam for LIT403 with grade 88 is added for alfred
A new student with user name harvey has been added.
Exam for MATH301 with grade 90 is added for harvey
A new student with user name joker has been added.
Exam for CS201 with grade 74 is added for joker
A new student with user name gordon has been added.
Exam for ECON201 with grade 87 is added for gordon
File has been processed.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
5

Printing all students in alphabetical order.
alfred
-------------------
LIT403: 88

bruce
```

```
-------------------
EE201: 80
ACC101: 67

gordon
-------------------
ECON201: 87

harvey
-------------------
MATH301: 90

joker
-------------------
CS201: 74

rachel
-------------------
FIN303: 45


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
2
Please enter the user name of the student:
ramirez
Please enter the name of the course:
NS101
Please enter the grade[0..100]
43
A new student with user name ramirez has been added.
Exam for NS101 with grade 43 is added for ramirez

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
alfred

Student alfred has been deleted.

Exam Grades
-----------------------------------
```

```
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
5

Printing all students in alphabetical order.
bruce
-------------------
EE201: 80
ACC101: 67

gordon
-------------------
ECON201: 87

harvey
-------------------
MATH301: 90

joker
-------------------
CS201: 74

rachel
-------------------
FIN303: 45

ramirez
-------------------
NS101: 43


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
2
Please enter the user name of the student:
bane
Please enter the name of the course:
VA205
Please enter the grade[0..100]
67
A new student with user name bane has been added.
Exam for VA205 with grade 67 is added for bane

Exam Grades
-----------------------------------
```

```
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
2
Please enter the user name of the student:
harley
Please enter the name of the course:
CS300
Please enter the grade[0..100]
100
A new student with user name harley has been added.
Exam for CS300 with grade 100 is added for harley

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
ramirez

Student ramirez has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
4
Please enter the user name of the student
ramirez

Student does not exist in the list.


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
```

```
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
6

Printing all students in reverse alphabetical order.
rachel
-------------------
FIN303: 45

joker
-------------------
CS201: 74

harvey
-------------------
MATH301: 90

harley
-------------------
CS300: 100

gordon
-------------------
ECON201: 87

bruce
-------------------
EE201: 80
ACC101: 67

bane
-------------------
VA205: 67


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
bane

Student bane has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
```

```
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
bruce

Student bruce has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
harley

Student harley has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
harvey

Student harvey has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
harvey

Student does not exist in the list.
```

```
Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
5

Printing all students in alphabetical order.
gordon
-------------------
ECON201: 87

joker
-------------------
CS201: 74

rachel
-------------------
FIN303: 45


Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
gordon

Student gordon has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
joker

Student joker has been deleted.
```

```
Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
3
Please enter the user name of the student
rachel

Student rachel has been deleted.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
5

Student list is empty.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
6

Student list is empty.

Exam Grades
-----------------------------------
Please select one option [1..7]:
1. Load information from a file
2. Add student and exam manually
3. Delete a student
4. Display exam grades of a student
5. Display exam grades of all students in alphabetical order
6. Display exam grades of all students in reverse alphabetical order
7. Exit
Your choice:
7
Exiting..
Press any key to continue . . .
```

Some Important Rules

In order to get a full credit, your programs must be efficient and well presented, presence of any redundant computation or bad indentation, or missing, irrelevant comments are going to decrease your grades. You also have to use understandable identifier names, informative introduction and prompts. Modularity is also important; you have to use functions wherever needed and appropriate. Since using classes is mandated in this homework, a proper object oriented design and implementation will also be considered in grading.

Since you will use dynamic memory allocation in this homework, it is very crucial to properly manage the allocated area and return the deleted parts to the heap whenever appropriate. Inefficient use of memory may reduce your grade.

When we grade your homework we pay attention to these issues. Moreover, in order to observe the real performance of your codes, we may run your programs in *Release* mode and **we may test your programs with very large test cases**. Of course, your program should work in *Debug* mode as well.

What and where to submit (PLEASE READ, IMPORTANT)

You should prepare (or at least test) your program using MS Visual Studio 2012 C++. We will use the standard C++ compiler and libraries of the abovementioned platform while testing your homework. It'd be a good idea to write your name and last name in the program (as a comment line of course).

Submissions guidelines are below. Some parts of the grading process are automatic. Students are expected to strictly follow these guidelines in order to have a smooth grading process. If you do not follow these guidelines, depending on the severity of the problem created during the grading process, 5 or more penalty points are to be deducted from the grade. Name your solution, project, cpp file that contains your main program using the following convention (the necessary file extensions such as .sln, .cpp, etc, are to be added to it):

"SUCourseUserName_YourLastname_YourName_HWnumber"

Your SUCourse user name is actually your SUNet user name which is used for checking sabanciuniv e-mails. Do NOT use any spaces, non-ASCII and Turkish characters in the file name. For example, if your SUCourse user name is cago, name is Çağlayan, and last name is Özbugsızkodyazaroğlu, then the file name must be:

Cago_Ozbugsizkodyazaroglu_Caglayan_hw3

In some homework assignments, you may need to have more than one .cpp or .h files to submit. In this case add informative phrases after the hw number. However, do not add any other character or phrase to the file names.

Now let us explain which files will be included in the submitted package. Visual Studio 2012 will create two *debug* folders, one for the solution and the other one for the project. You should delete these two *debug* folders. Moreover, if you have run your program in release mode, Visual Studio may create *release* folders; you should delete these as well. Apart from these, Visual Studio 2012 creates a file extension of *.sdf*; you will also delete this file. The remaining content of your solution folder is to be submitted after compression. Compress your solution and project folders using WINZIP or WINRAR programs. Please use "zip" compression. "rar" or another compression mechanism is NOT allowed. Our homework processing system works only with zip files. Therefore, make sure that the resulting compressed file has a zip extension. Check that your compressed file opens up correctly and it contains all of the solution, project and source code files that belong to the latest version of your homework. Especially double-check that the zip file contains your cpp and (if any) header files that you wrote for the homework.

Moreover, we strongly recommend you to check whether your zip file will open up and run correctly. To do so, unzip your zip file to another location. Then, open your solution by clicking the file that has a file extension of .sln. Clean, build and run the solution; if there is no problem, you could submit your zip file. Please note that the deleted files/folders may be regenerated after you build and run your program; this is normal, but do not include them in the submitted zip file.

You will receive no credits if your compressed zip file does not expand or it does not contain the correct files. The naming convention of the zip file is the same. The name of the zip file should be as follows:

SUCourseUserName_YourLastname_YourName_HWnumber.zip

For example zubzipler_Zipleroglu_Zubeyir_hw3.zip is a valid name, but

Hw3_hoz_HasanOz.zip, HasanOzHoz.zip

are **NOT** valid names.

Submit via SUCourse ONLY! You will receive no credits if you submit by other means (e-mail, paper, etc.).

Successful submission is one of the requirements of the homework. If, for some reason, you cannot successfully submit your homework and we cannot grade it, your grade will be 0.

Good Luck!

Albert Levi, Ömer Mert Candan