

Program 4: Database of Students

CS 211, UIC Spring 2023

Description

In the real world, databases are used to store information that a company, website, etc needs, and software can be used to access and update the organized information. Typically, a database is implemented by means of a *B-tree*, a type of data structure that allows for efficient search, insertion, and removal of data in sorted order.

For this program, you will be implementing a (heavily) simplified database system to store information about students. The implementation will make use of linked structures.

The data about the students will be as follows:

- Name - the first and last name of the student
- ID - a unique identifier for each student, similar to your UIN
- GPA - the student's overall GPA
- Credit Hours - the number of credit hours the student has completed

In order to store the information, the following structures will be used:

```
typedef struct {
    char* name;
    char* id;
    double gpa;
    int creditHours;
} Student;

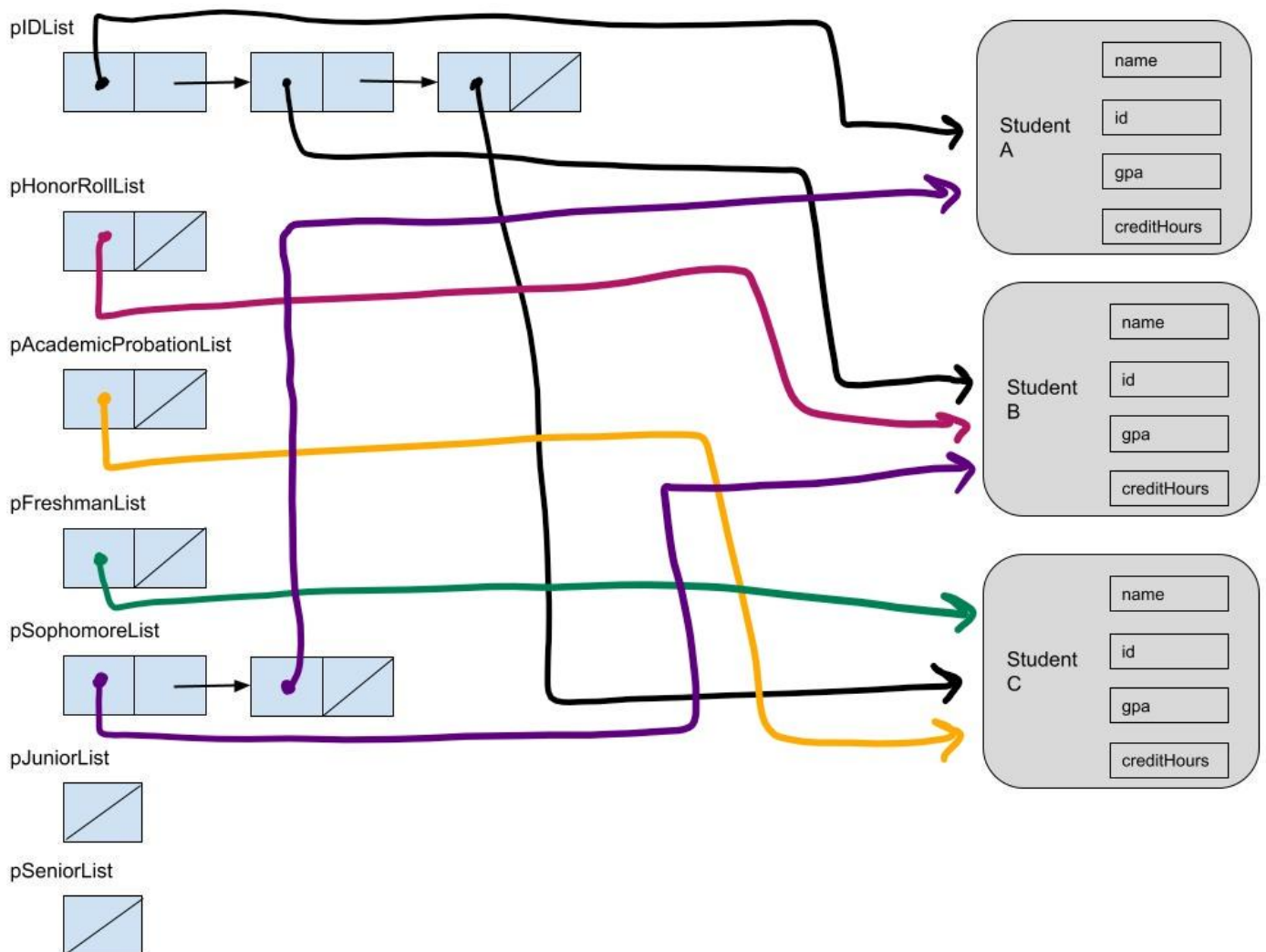
typedef struct StudentNode{
    Student* pStudent;
    struct StudentNode* pNext;
} StudentNode;

typedef struct {
    StudentNode* pIDList;
    StudentNode* pHonorRollList;
    StudentNode* pAcademicProbationList;
    StudentNode* pFreshmanList;
    StudentNode* pSophomoreList;
    StudentNode* pJuniorList;
    StudentNode* pSeniorList;
} Database;
```

Notice that the Database struct contains different lists, each of which represents the first node of a linked list that is made up of pointers to Student structs:

- pIDList stores pointers to all the students. (If you were to relate this to a database, the ID would be the *primary key* because it uniquely identifies each student.)
- pHonorRollList stores pointers to students who are on the honor roll. A student is on the honor roll if their overall GPA is greater than or equal to 3.50.
- pAcademicProbationList stores pointers to students who are on academic probation. A student is on academic probation if their overall GPA is below 2.00.
- pFreshmanList, pSophomoreList, pJuniorList, pSeniorList store pointers to students in each respective class standing, which is based on the credit hours they have completed. (The guidelines below were taken from <https://registrar.uic.edu/regISTRATION/policies-procedures/#standing>.)
 - Freshman: 0 through 29
 - Sophomore: 30 through 59
 - Junior: 60 through 89
 - Senior: 90-hour minimum

If you were to visualize the structure, it may look something like this:



Notice that there is a pointer to all students on pIDList. For each of the other lists, however, only students who qualify will be included, so the list may have no students, some of them, or all of them. Similarly, a student may not appear on either the honor roll or academic probation list.

Failure to implement the structures as explained in this description will result in a score of zero.

Running the Program

To begin, the user may choose to start with an empty database or with information read in from a file. If they choose to have information from a file, your program should prompt them for the filename. Invalid input for E or F will prompt the user to continue entering input until it is valid.

```
CS 211, Spring 2023
Program 4: Database of Students

Enter E to start with an empty database,
or F to start with a database that has information on students from a file.
Your choice --> F
Enter the name of the file you would like to use: small-list.csv

Enter:  C to create a new student and add them to the database,
        R to read from the database,
        D to delete a student from the database, or
        X to exit the program.
Your choice --> X

Thanks for playing!
Exiting...
```

From there, the main menu is displayed. In a database, there are four main operations involved in its maintenance, abbreviated as CRUD: create, read, update, delete. For this program, you will be implementing the Create, Read (very simplified), and Delete operations.

If the user selects C to Create, ask them for the information for the new student. Add them to the database, updating the linked lists appropriately. A message is displayed, showing the user that the student was successfully added.

```
Enter:  C to create a new student and add them to the database,
        R to read from the database,
        D to delete a student from the database, or
        X to exit the program.
Your choice --> C
Enter the name of the new student: Ellen Kidane
Enter the ID of the new student: 6A98DB973K
Enter the GPA of the new student: 3.96
Enter the credit hours of the new student: 47
Successfully added the following student to the database!
Ellen Kidane:
    ID - 6A98DB973K
    GPA - 3.96
    Credit Hours - 47
```

In the case that the user selects R to read, a subsequent menu is displayed.

```
Enter:  C to create a new student and add them to the database,
        R to read from the database,
        D to delete a student from the database, or
        X to exit the program.
Your choice --> R
Select one of the following:
    1) Display the head (first 10 rows) of the database
    2) Display students on the honor roll, in order of their GPA
    3) Display students on academic probation, in order of their GPA
    4) Display freshmen students, in order of their name
    5) Display sophomore students, in order of their name
    6) Display junior students, in order of their name
    7) Display senior students, in order of their name
    8) Display the information of a particular student
Your choice --> 9
Sorry, that input was invalid. Please try again.
Your choice --> 5
Barnaby Mcknight:
    ID - 6VMDWBKUHT
    GPA - 1.25
    Credit Hours - 34
Chiara O'Reilly:
    ID - 6NCZ1FZ2BJ
    GPA - 2.35
    Credit Hours - 35
Ellen Kidane:
    ID - 6A98DB973K
    GPA - 3.42
    Credit Hours - 47
Erika Lowery:
    ID - 6JM4WUQ20G
    GPA - 2.84
    Credit Hours - 59
Safa Cordova:
    ID - 6IRQ1460HS
    GPA - 1.91
    Credit Hours - 50
```

As shown above, if the user types something other than 1-8, they are asked to try again.

- Menu option 1 displays a sample of the database by printing the information of the first 10 students. They are ordered by their ID, so the first 10 students would be the ones whose ID comes first alphanumerically.
- Menu options 2 and 3 display the students on the honor roll and on academic probation, respectively. The students are listed in ascending order by their GPA.
- Menu options 4-7 display the students in each class. The students are listed in ascending order by their name.

- Menu option 8 allows the user to search for a particular student by ID. The program will ask them to enter the ID of the student they would like to find.

```
Enter: C to create a new student and add them to the database,
      R to read from the database,
      D to delete a student from the database, or
      X to exit the program.
Your choice --> R
Select one of the following:
  1) Display the head (first 10 rows) of the database
  2) Display students on the honor roll, in order of their GPA
  3) Display students on academic probation, in order of their GPA
  4) Display freshmen students, in order of their name
  5) Display sophomore students, in order of their name
  6) Display junior students, in order of their name
  7) Display senior students, in order of their name
  8) Display the information of a particular student
Your choice --> 8
Enter the id of the student to find: 646ABCD89
Sorry, there is no student in the database with the id 646ABCD89.

Enter: C to create a new student and add them to the database,
      R to read from the database,
      D to delete a student from the database, or
      X to exit the program.
Your choice --> R
Select one of the following:
  1) Display the head (first 10 rows) of the database
  2) Display students on the honor roll, in order of their GPA
  3) Display students on academic probation, in order of their GPA
  4) Display freshmen students, in order of their name
  5) Display sophomore students, in order of their name
  6) Display junior students, in order of their name
  7) Display senior students, in order of their name
  8) Display the information of a particular student
Your choice --> 8
Enter the id of the student to find: 6JM4WUQ20G
Erika Lowery:
  ID - 6JM4WUQ20G
  GPA - 2.84
  Credit Hours - 59
```

The user may also select D from the main menu, which prompts them to enter the ID of the student they would like to have removed from the database. If the student is found, the linked lists should be updated appropriately and all associated memory should be freed.

```
Enter: C to create a new student and add them to the database,
      R to read from the database,
      D to delete a student from the database, or
      X to exit the program.
Your choice --> D
Enter the id of the student to be removed: 646ABCD89
Sorry, there is no student in the database with the id 646ABCD89.

Enter: C to create a new student and add them to the database,
      R to read from the database,
      D to delete a student from the database, or
      X to exit the program.
Your choice --> D
Enter the id of the student to be removed: 6A98DB973K

Enter: C to create a new student and add them to the database,
      R to read from the database,
      D to delete a student from the database, or
      X to exit the program.
Your choice --> R
Select one of the following:
    1) Display the head (first 10 rows) of the database
    2) Display students on the honor roll, in order of their GPA
    3) Display students on academic probation, in order of their GPA
    4) Display freshmen students, in order of their name
    5) Display sophomore students, in order of their name
    6) Display junior students, in order of their name
    7) Display senior students, in order of their name
    8) Display the information of a particular student
Your choice --> 5
Barnaby Mcknight:
    ID - 6VMDWBKUHT
    GPA - 1.25
    Credit Hours - 34
Chiara O'Reilly:
    ID - 6NCZ1FZ2BJ
    GPA - 2.35
    Credit Hours - 35
Erika Lowery:
    ID - 6JM4WUQ20G
    GPA - 2.84
    Credit Hours - 59
Safa Cordova:
    ID - 6IRQ1460HS
    GPA - 1.91
    Credit Hours - 50
```

If the input for the main menu is invalid, i.e. not C, R, D, or X, the user will be prompted to try again.

Submission

Submit your code to Gradescope. You only need to submit your .c file. The autograder will run automatically, and the resulting credit will be your execution points total.

By default, your *last (i.e. most recent)* submission on Gradescope is what will be graded. If you would like us to grade an earlier version of your program, use *the Activate button* to select it from your Submission History. This must be done *before* the deadline. Only one version of your program can be graded for both execution and style points.

For this program, no late submissions will be accepted.

This program will be graded only on execution. Although we will not be manually grading for style, we will be manually reviewing submissions to check whether or not the implementation described here was used.

Sample Output

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Program 4: Database of Students

Enter E to start with an empty database,
or F to start with a database that has information on students from a file.

Your choice --> f

Sorry, that input was invalid. Please try again.

Your choice --> F

Enter the name of the file you would like to use: small-list.csv

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 1

Tanya Dunn:

ID - 60XP4XQ07V
GPA - 3.86
Credit Hours - 120

Brayden Shepherd:

ID - 64VXFY51EC
GPA - 2.78
Credit Hours - 93

Yusuf Cannon:

ID - 6CY4537WSX
GPA - 3.40
Credit Hours - 22

Safa Cordova:

ID - 6IRQ1460HS
GPA - 1.91
Credit Hours - 50

Erika Lowery:

ID - 6JM4WUQ20G
GPA - 2.84
Credit Hours - 59

Vincent Morris:

ID - 6LRO8JWANJ
GPA - 3.17
Credit Hours - 14

Chiara O'Reilly:

ID - 6NCZ1FZ2BJ
GPA - 2.35

Credit Hours - 35
Robertta Ellis:
ID - 6VCGEMOYDE
GPA - 1.52
Credit Hours - 25
Barnaby Mcknight:
ID - 6VMDWBKUHT
GPA - 1.25
Credit Hours - 34
Rishi Duncan:
ID - 6X6YO7MM5S
GPA - 3.59
Credit Hours - 101

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 2

Rishi Duncan:
ID - 6X6YO7MM5S
GPA - 3.59
Credit Hours - 101

Tanya Dunn:
ID - 60XP4XQ07V
GPA - 3.86
Credit Hours - 120

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name

8) Display the information of a particular student

Your choice --> 3

Barnaby Mcknight:

ID - 6VMDWBKUHT

GPA - 1.25

Credit Hours - 34

Roberta Ellis:

ID - 6VCGEMOYDE

GPA - 1.52

Credit Hours - 25

Safa Cordova:

ID - 6IRQ1460HS

GPA - 1.91

Credit Hours - 50

Enter: C to create a new student and add them to the database,

R to read from the database,

D to delete a student from the database, or

X to exit the program.

Your choice --> R

Select one of the following:

1) Display the head (first 10 rows) of the database

2) Display students on the honor roll, in order of their GPA

3) Display students on academic probation, in order of their GPA

4) Display freshmen students, in order of their name

5) Display sophomore students, in order of their name

6) Display junior students, in order of their name

7) Display senior students, in order of their name

8) Display the information of a particular student

Your choice --> 4

Roberta Ellis:

ID - 6VCGEMOYDE

GPA - 1.52

Credit Hours - 25

Vincent Morris:

ID - 6LRO8JWANJ

GPA - 3.17

Credit Hours - 14

Yusuf Cannon:

ID - 6CY4537WSX

GPA - 3.40

Credit Hours - 22

Enter: C to create a new student and add them to the database,

R to read from the database,

D to delete a student from the database, or

X to exit the program.

Your choice --> R

Select one of the following:

1) Display the head (first 10 rows) of the database

2) Display students on the honor roll, in order of their GPA

- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 5

Barnaby Mcknight:

ID - 6VMDWBKUHT

GPA - 1.25

Credit Hours - 34

Chiara O'Reilly:

ID - 6NCZ1FZ2BJ

GPA - 2.35

Credit Hours - 35

Erika Lowery:

ID - 6JM4WUQ20G

GPA - 2.84

Credit Hours - 59

Safa Cordova:

ID - 6IRQ1460HS

GPA - 1.91

Credit Hours - 50

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 6

There are no students matching that criteria.

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name

- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 7

Brayden Shepherd:

ID - 64VXFY51EC
GPA - 2.78
Credit Hours - 93

Rishi Duncan:

ID - 6X6YO7MM5S
GPA - 3.59
Credit Hours - 101

Tanya Dunn:

ID - 60XP4XQ07V
GPA - 3.86
Credit Hours - 120

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 8

Enter the id of the student to find: 6A98DB973K

Sorry, there is no student in the database with the id 6A98DB973K.

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 8

Enter the id of the student to find: 6X6YO7MM5S

Rishi Duncan:

ID - 6X6Y07MM5S
GPA - 3.59
Credit Hours - 101

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> C

Enter the name of the new student: Ellen Kidane

Enter the ID of the new student: 6A98DB973K

Enter the GPA of the new student: 3.96

Enter the credit hours of the new student: 74

Successfully added the following student to the database!

Ellen Kidane:

ID - 6A98DB973K
GPA - 3.96
Credit Hours - 74

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 1

Tanya Dunn:

ID - 60XP4XQ07V
GPA - 3.86
Credit Hours - 120

Brayden Shepherd:

ID - 64VXFY51EC
GPA - 2.78
Credit Hours - 93

Ellen Kidane:

ID - 6A98DB973K
GPA - 3.96
Credit Hours - 74

Yusuf Cannon:

ID - 6CY4537WSX
GPA - 3.40
Credit Hours - 22

Safa Cordova:

ID - 6IRQ1460HS

GPA - 1.91
Credit Hours - 50
Erika Lowery:
ID - 6JM4WUQ20G
GPA - 2.84
Credit Hours - 59
Vincent Morris:
ID - 6LRO8JWANJ
GPA - 3.17
Credit Hours - 14
Chiara O'Reilly:
ID - 6NCZ1FZ2BJ
GPA - 2.35
Credit Hours - 35
Robertta Ellis:
ID - 6VCGEMOYDE
GPA - 1.52
Credit Hours - 25
Barnaby Mcknight:
ID - 6VMDWBKUHT
GPA - 1.25
Credit Hours - 34

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 2

Rishi Duncan:
ID - 6X6YO7MM5S
GPA - 3.59
Credit Hours - 101

Tanya Dunn:
ID - 60XP4XQ07V
GPA - 3.86
Credit Hours - 120

Ellen Kidane:
ID - 6A98DB973K
GPA - 3.96
Credit Hours - 74

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 3

Barnaby Mcknight:

ID - 6VMDWBKUHT
GPA - 1.25
Credit Hours - 34

Roberta Ellis:

ID - 6VCGEMOYDE
GPA - 1.52
Credit Hours - 25

Safa Cordova:

ID - 6IRQ1460HS
GPA - 1.91
Credit Hours - 50

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 4

Roberta Ellis:

ID - 6VCGEMOYDE
GPA - 1.52
Credit Hours - 25

Vincent Morris:

ID - 6LRO8JWANJ
GPA - 3.17
Credit Hours - 14

Yusuf Cannon:

ID - 6CY4537WSX

GPA - 3.40
Credit Hours - 22

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 5

Barnaby Mcknight:

ID - 6VMDWBKUHT
GPA - 1.25
Credit Hours - 34

Chiara O'Reilly:

ID - 6NCZ1FZ2BJ
GPA - 2.35
Credit Hours - 35

Erika Lowery:

ID - 6JM4WUQ20G
GPA - 2.84
Credit Hours - 59

Safa Cordova:

ID - 6IRQ1460HS
GPA - 1.91
Credit Hours - 50

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> P

Invalid option. Try again.

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA

- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 9

Sorry, that input was invalid. Please try again.

Your choice --> 6

Ellen Kidane:

ID - 6A98DB973K

GPA - 3.96

Credit Hours - 74

Enter: C to create a new student and add them to the database,

R to read from the database,

D to delete a student from the database, or

X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
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- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 7

Brayden Shepherd:

ID - 64VXFY51EC

GPA - 2.78

Credit Hours - 93

Rishi Duncan:

ID - 6X6YO7MM5S

GPA - 3.59

Credit Hours - 101

Tanya Dunn:

ID - 60XP4XQ07V

GPA - 3.86

Credit Hours - 120

Enter: C to create a new student and add them to the database,

R to read from the database,

D to delete a student from the database, or

X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA

- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 8

Enter the id of the student to find: 6A98DB973K

Ellen Kidane:

ID - 6A98DB973K

GPA - 3.96

Credit Hours - 74

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> D

Enter the id of the student to be removed: 6A98DB973K

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.

Your choice --> R

Select one of the following:

- 1) Display the head (first 10 rows) of the database
- 2) Display students on the honor roll, in order of their GPA
- 3) Display students on academic probation, in order of their GPA
- 4) Display freshmen students, in order of their name
- 5) Display sophomore students, in order of their name
- 6) Display junior students, in order of their name
- 7) Display senior students, in order of their name
- 8) Display the information of a particular student

Your choice --> 1

Tanya Dunn:

ID - 60XP4XQ07V

GPA - 3.86

Credit Hours - 120

Brayden Shepherd:

ID - 64VXFY51EC

GPA - 2.78

Credit Hours - 93

Yusuf Cannon:

ID - 6CY4537WSX

GPA - 3.40

Credit Hours - 22

Safa Cordova:

ID - 6IRQ1460HS

GPA - 1.91

Credit Hours - 50

Erika Lowery:

ID - 6JM4WUQ20G

GPA - 2.84

Credit Hours - 59
Vincent Morris:
ID - 6LRO8JWANJ
GPA - 3.17
Credit Hours - 14
Chiara O'Reilly:
ID - 6NCZ1FZ2BJ
GPA - 2.35
Credit Hours - 35
Roberta Ellis:
ID - 6VCGEMOYDE
GPA - 1.52
Credit Hours - 25
Barnaby Mcknight:
ID - 6VMDWBKUHT
GPA - 1.25
Credit Hours - 34
Rishi Duncan:
ID - 6X6Y07MM5S
GPA - 3.59
Credit Hours - 101

Enter: C to create a new student and add them to the database,
R to read from the database,
D to delete a student from the database, or
X to exit the program.
Your choice --> X

Thanks for playing!
Exiting...