Project 1: Structure and Array

Description:

Write a program that provides a way for you to search and display information of all the students in a class. Student records including a class ID (c#), name of the student, and scores of multiple categories are saved in the file ***grades.dat***. Your program should:

- First, read all student information from the text file and store them in an array.
- Then display information of all the students in table format.
- Prompt user to input a valid c#, and the program display all the information of the student with the given c#. (when invalid c# is entered, continue to prompt until a valid c# is entered)
- Sort all the students by name, and display information of all the students in table format.

Requirements

You are required to:

- declare a structure **StudentType** to hold all information of a student, such as c#, name and all scores.
- declare a local variable **roster** in main function as an array of Student structure. This array will hold information of all students.
- declare and implement the following functions:
  - a function to read from the text file
  - a function to print information of all the students in table form
  - a function to print information of one student, with label for each data
  - a function to check whether a class ID is valid
  - a function to sort all students by name

  Function prototypes should be used for all user defined functions.
  Global variables are not allowed.

How to submit your Project

- Thoroughly test your program with different user inputs. Check that the program outputs are correct. When you are ready to submit your project, log into D2L, enter the D2L course page, click on "Assessment" tab on the top navigation bar, select "Dropbox". Click on the dropbox with the current project name. Upload ALL the files needed for this project: type.h, main.cpp, and grades.dat.
- Submit the project before the due date to avoid late penalty. You may submit your project multiple times before project due date.
- After the due date, submit your project to the dropbox for late submission.

Example output

```
Here is the information of the 17 students:

ClassID   Name           CLA       OLA       Quiz      Homework  Exam      Bonus

c0801     Tony           10        15        4         15        56        3
c0802     Sam            9         12        2         11        46        2
c0803     Bradly         8         10        3         12        50        1
c0804     Joy            5         5         3         10        53        3
c0805     Kimberly       3         11        1         10        45        0
c0806     Mike           8         14        2         11        40        1
c0807     Henry          4         12        2         12        48        2
c0808     Katy           10        10        3         11        36        0
c0809     Charles        8         8         3         11        39        0
c0810     Noah           6         9         4         9         47        3
c0811     Henry          8         7         3         13        41        3
c0812     Alexander      4         11        3         11        37        1
c0813     Rihanna        9         15        2         8         50        2
c0814     Sophia         8         12        2         10        48        3
c0815     Jordan         6         8         1         7         45        1
c0816     Natalie        7         7         2         6         51        2
c0817     Matthew        8         9         2         12        38        2

Enter a valid Class ID: c0934

Enter a valid Class ID: 23855

Enter a valid Class ID: c0345

Enter a valid Class ID: c0806
Information for student with ID: c0806
Name: Mike
CLA: 8
OLA: 14
Quiz:2
Homework: 11
Exam: 40
Bonus: 1

Sorting student records by name . . .

Here is the information of the 17 students:

ClassID   Name           CLA       OLA       Quiz      Homework  Exam      Bonus

c0812     Alexander      4         11        3         11        37        1
c0803     Bradly         8         10        3         12        50        1
c0809     Charles        8         8         3         11        39        0
c0807     Henry          4         12        2         12        48        2
c0811     Henry          8         7         3         13        41        3
c0815     Jordan         6         8         1         7         45        1
c0804     Joy            5         5         3         10        53        3
c0808     Katy           10        10        3         11        36        0
c0805     Kimberly       3         11        1         10        45        0
c0817     Matthew        8         9         2         12        38        2
c0806     Mike           8         14        2         11        40        1
c0816     Natalie        7         7         2         6         51        2
c0810     Noah           6         9         4         9         47        3
c0813     Rihanna        9         15        2         8         50        2
c0802     Sam            9         12        2         11        46        2
c0814     Sophia         8         12        2         10        48        3
c0801     Tony           10        15        4         15        56        3
```