Course Number and Name: CSE 4308 Database Management Systems Lab	
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Report Submission Date: 14 August, 2022	**Name of Lab Instructor:** Md. Bakhtiar Hasan, Lecturer, CSE

Task 1

Problem Statement:

Print the Student ID having the highest GPA among all the students.

Analysis of the problem:

It is necessary to separate information the text file grades.txt by columns to compare the GPA of all the students. A variable maxGPA can be used to compare GPA i.e. the second column of the file each time and store the GPA if it is larger than the previous values. Each time a string variable holding the Student ID is updated if maxGPA is updated. The Student ID is then printed to the console.

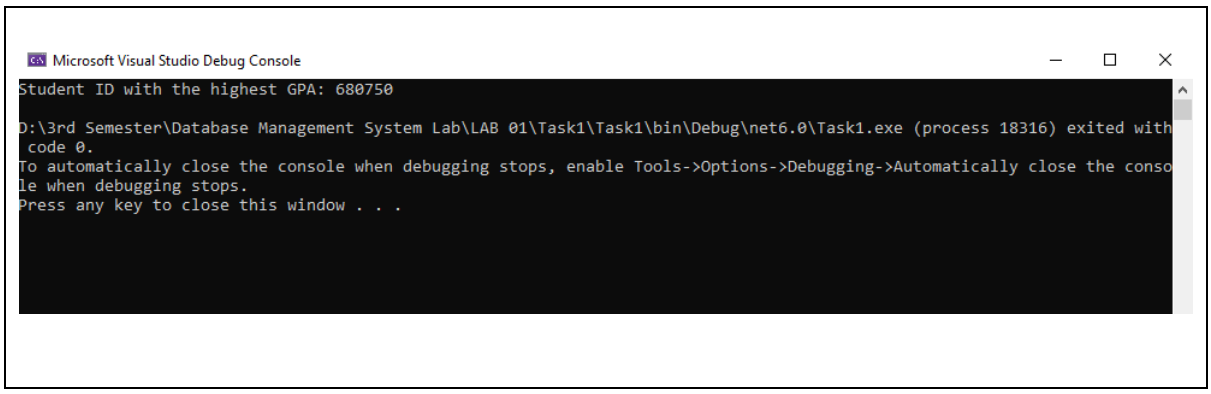
Working code (using C#):

```
double maxGPA = 0.0; //for comparison purpose
string s = "\0"; // to store students id

using (var reader = new System.IO.StreamReader(@"D:\3rd Semester\Database
Management System Lab\LAB 01\grades.txt"))
{
    while (!reader.EndOfStream)
    {
        var line = reader.ReadLine();
        var values = line.Split(';');
        values = line.Split(';');

        //if maxGPA is lower than this gpa
        if (maxGPA < Convert.ToDouble(values[1]))
            s = values[0];
        values = line.Split(';');

    }
}

//print that student's id
Console.WriteLine("Student ID with the highest GPA: "+ Convert.ToString(s));

return 0;
```

Any problems faced and how it was solved:

Since the task was straightforward, there was not much difficulty faced.

Results:


Microsoft Visual Studio Debug Console
Student ID with the highest GPA: 680750
D:\3rd Semester\Database Management System Lab\LAB 01\Task1\Task1\bin\Debug\net6.0\Task1.exe (process 18316) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

Task 2

Problem Statement:

Take Student ID, GPA, and Semester as input. Then after validating the input, insert the information as a new row in the grades.txt file. If the information is invalid, discard the input and show an error message.

Analysis of the problem:

The input of Student ID, GPA and Semester are stored in separate variables. For validation purpose, Student ID is checked against all the Student ID stored in studentInfo.txt file and considered validated if found. Similarly, GPA (between 2.50 and 4.00) and Semester (between 1 and 8 inclusive) are checked as well. If any of the input fails validation, an error message is printed and the program is terminated. To increase efficiency, the file studentInfo.txt can be read to find Student ID only if GPA and Semester input was found valid.

Working code (using C#):

```
string input;
var StudentID = "";
var GPA = "";
var Semester = "";

//take the input all at one in one string
//then it is divided to different strings - studentID, GPA and Semester
Console.WriteLine("Enter Student ID, GPA and Semester (IN ORDER): ");
input = Console.ReadLine() + "\0";


//check the condition for i to avoid array out of bounds (before and after
the loop)
// i++ afterwards so as to skip the space that broke the loop
int i = 0;
while (input[i]!= ' ' && input[i]!='\0' && i<input.Length)
{
    StudentID+=input[i];
    i++;
    if (i==input.Length)
        break;
}
i++;

while (input[i]!= ' '  && input[i]!='\0' && i<input.Length)
{
    GPA+=input[i];
    i++;
    if (i==input.Length)
        break;
}
i++;
```

```
while (input[i]!= ' '  && input[i]!='\0' && i<input.Length)
{
    Semester+=input[i];
    i++;
    if (i==input.Length)
        break;
}


//checking if the gpa and semester input is valid
//if invalid, no need to search any further
if (Convert.ToDouble(GPA) < 2.50 || Convert.ToDouble(GPA) > 4.00)
{
    Console.WriteLine("Input is invalid!\n");
    return 0;
}

if ( Convert.ToInt32(Semester) < 1 ||  Convert.ToInt32(Semester) > 8)
{
    Console.WriteLine("Input is invalid!\n");
    return 0;
}


//search if student ID exists in studentInfo file
using (var reader = new System.IO.StreamReader(@"D:\3rd Semester\Database
Management System Lab\LAB 01\studentInfo.txt"))
{
    bool StudentExists = false;
    while (!reader.EndOfStream)
    {
        var line = reader.ReadLine();
        var values = line.Split(';');
        values = line.Split(';');
        values = line.Split(';');
        values = line.Split(';');

        //comparing between student ID entered and the student ID in the file
        //if found, assign a value to the bool value and write to grades.txt
file
        if (Convert.ToInt32(values[0]) == Convert.ToInt32(StudentID))
        {
            StudentExists = true;
            using (System.IO.StreamWriter sw = File.AppendText(@"D:\3rd
Semester\Database Management System Lab\LAB 01\grades.txt"))
            {
                sw.Write(StudentID  + ";" + GPA + ";" + Semester );
            }

            Console.WriteLine("Information stored successfully!\n");
            break;
        }
    }

    //error message printed if not found
    if (!StudentExists)
    {
        Console.WriteLine("Student that you entered doesn't exist.\n");
```

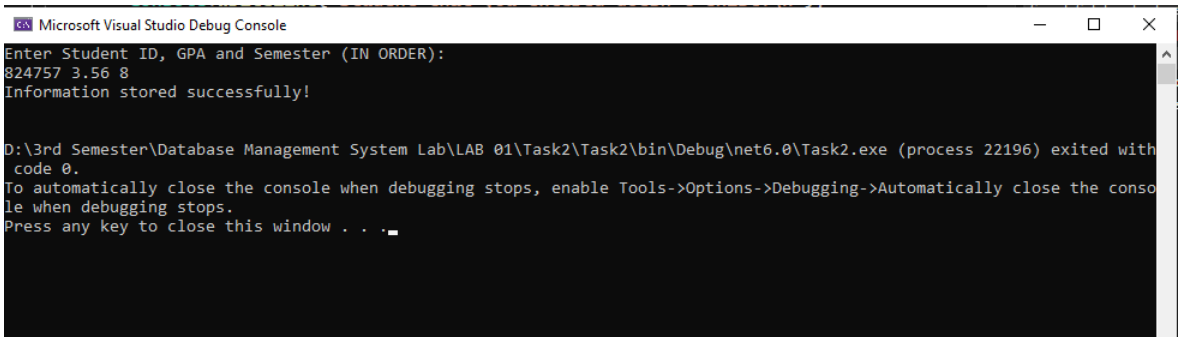
```
    }
}

return 0;
```

Any problems faced and how it was solved:

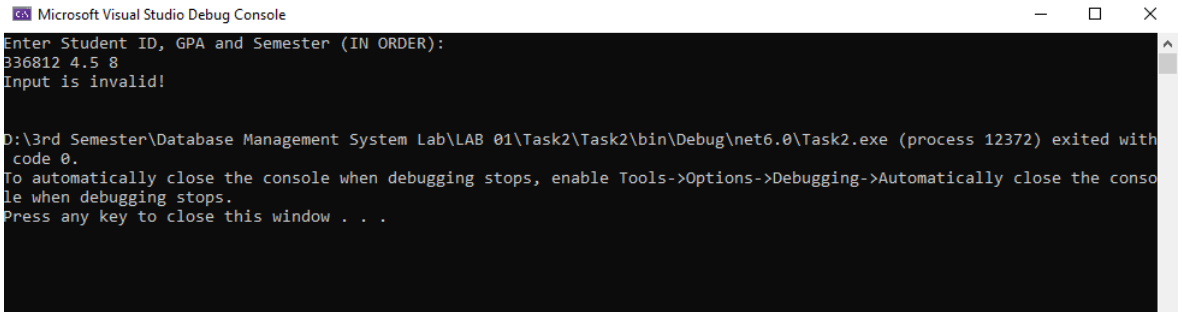
Since C# was used, all of the input (Student ID, GPA and Semester) had to be taken in one variable at first. To store it in three variables, a code block was written to split the input whenever there was a space (assuming the input was written in order).

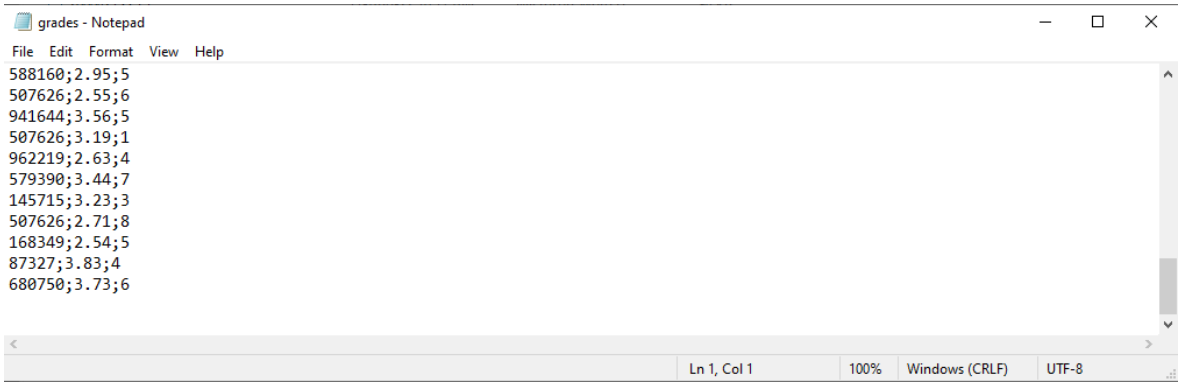
Results:

Correct input:

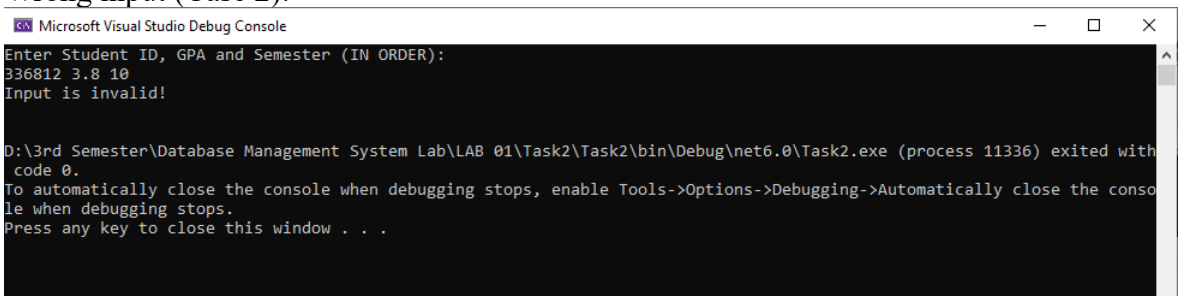


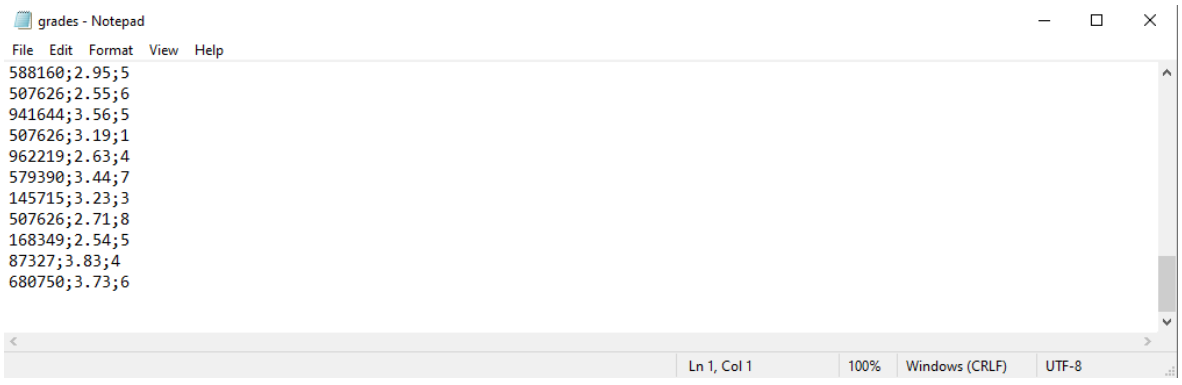
Wrong input (Case 1):



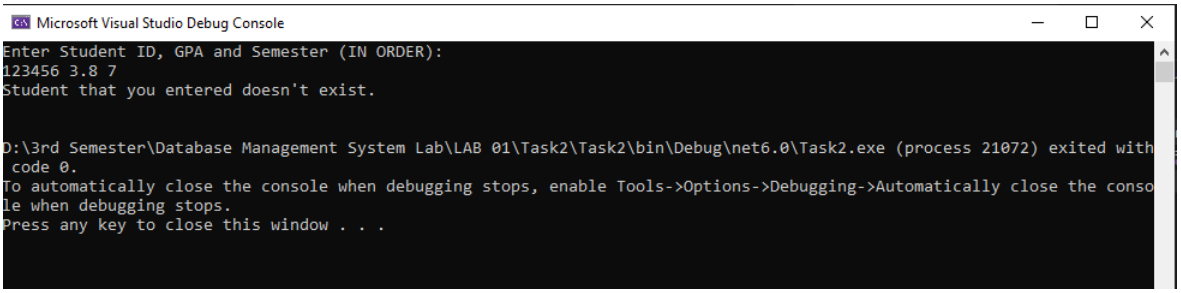


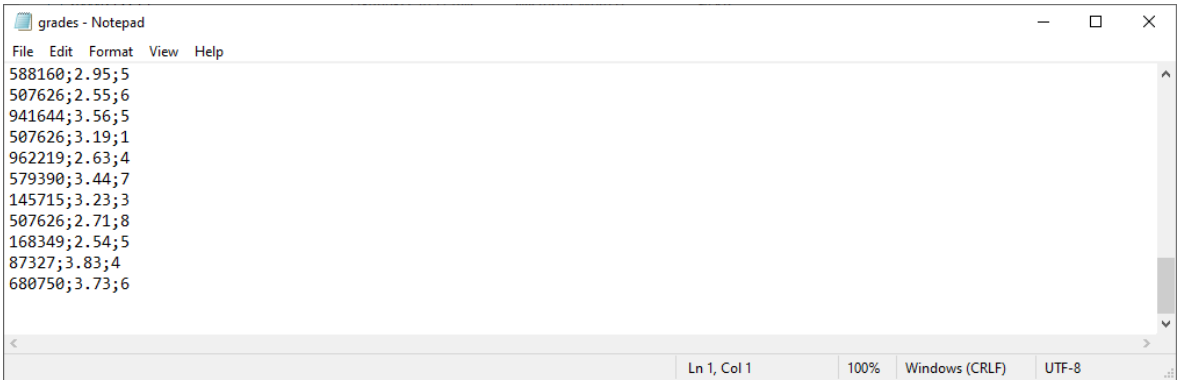
Wrong input (Case 2):



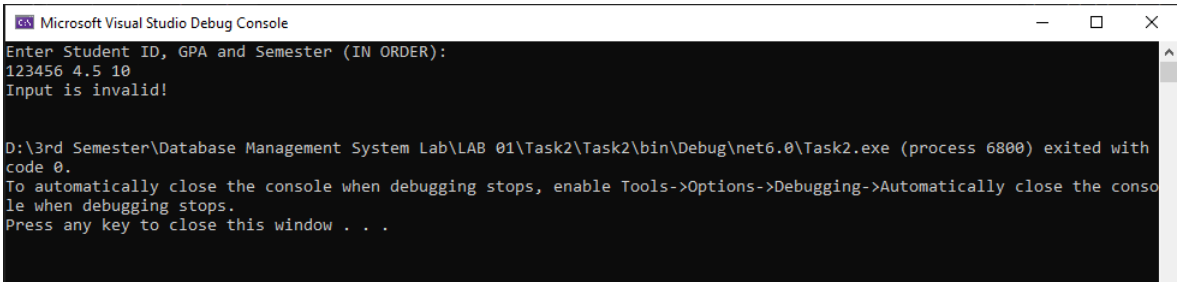


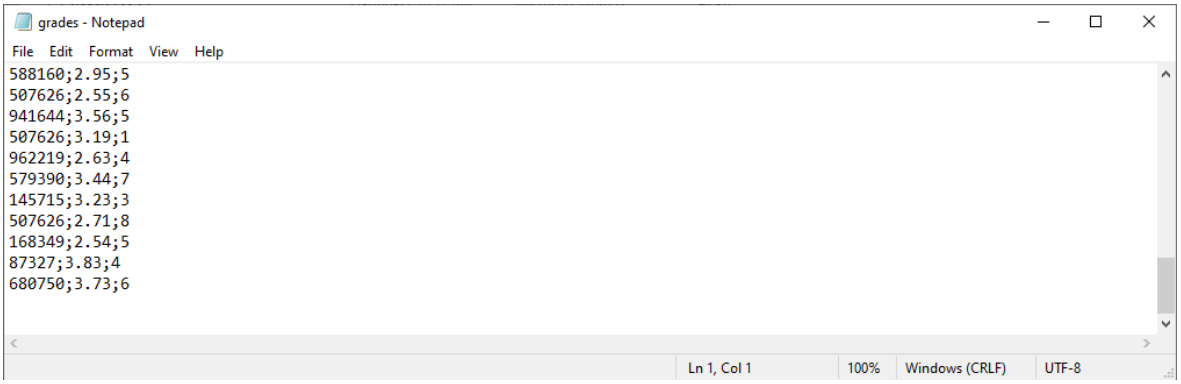
Wrong input (Case 3):





Wrong input (Case 4):





Task 3:

Problem Statement:

Take Student ID as input and show his/her name and CGPA (average GPA for all the semesters he/she attended). Print an error message if the Student ID does not exist in your database.

Analysis of the problem:

First the Student ID is searched in the file studentInfo.txt and an error message is printed if no search results are found.
If the student is found, the next steps are carried out. The name of the student, as found from studentInfo.txt file, is stored in a string variable. Then variables for holding the sum of all the GPA (GPASum) and the number of GPA (GPACount) entries are declared. grades.txt file is then read to search for all entries of the student using Student ID and GPASum and GPACount is updated accordingly.
Afterwards the CGPA is calculated by dividing GPASum by GPACount and CGPA and Student Name is printed to console.

Working code (using C#):

```
string StudentID;
Console.WriteLine("Enter student ID: ");
StudentID = Console.ReadLine() + "\0";


//a check variable so we can print an error message if student is not found
bool ck = false;
string StudentName = "\0";


using (var reader = new System.IO.StreamReader(@"D:\3rd Semester\Database
Management System Lab\LAB 01\studentInfo.txt"))
{
    while (!reader.EndOfStream)
    {
        var line = reader.ReadLine();
        var values = line.Split(';');
        values = line.Split(';');
        values = line.Split(';');
        values = line.Split(';');
        values = line.Split(';');

        if (Convert.ToInt32(StudentID) ==  Convert.ToInt32(values[0]))
        {
            // if student ID found in file
            //ck value true = student found
```

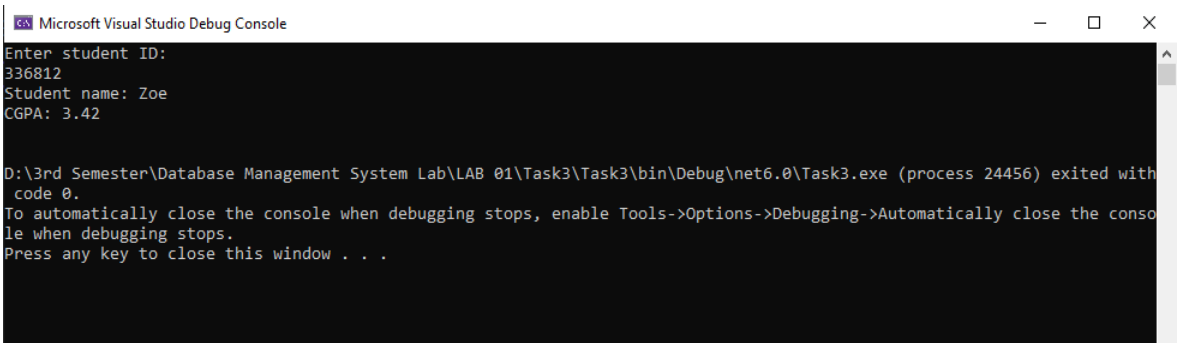
```
            //collect the student name from the file
            ck = true;
            StudentName = values[1];
            break; //stop the search since student is found
        }
    }
}

//terminate program if student was not found in studentInfo.txt
if (!ck)
{
    Console.WriteLine("Student not Found!\n");
    return 0;
}

//store all the acquired GPA over all the semesters
//store the number of GPAs found (for calculating average GPA)
double GPASum = 0.0;
int GPACount = 0;

using (var reader1 = new System.IO.StreamReader(@"D:\3rd Semester\Database
Management System Lab\LAB 01\grades.txt"))
{
    while (!reader1.EndOfStream)
    {
        var line1 = reader1.ReadLine();
        var values1 = line1.Split(';');
        values1 = line1.Split(';');
        values1 = line1.Split(';');

        //if student ID matches in the grades.txt file
        //iterate to find all the GPA and the number of GPAs for that student

        if ((Convert.ToInt32(StudentID) ==  Convert.ToInt32(values1[0])))
        {
            GPACount++;
            GPASum+= Convert.ToDouble(values1[1]);
        }
    }
}

Console.WriteLine("Student name: " + StudentName + "\n" + "CGPA: " +
Convert.ToString(GPASum/GPACount) + "\n");


return 0;
```

Any problems faced and how it was solved:

Since this problem had a lot of similarity to task 2, there were no problems faced during solving it.

Results:

Correct input:



Wrong input: