NATIONAL UNIVERISTY OF TECHNOLOGY

PF PBL DOCUMENTATION

PROJECT TITLE : STUDENT DATA MANAGEMENT SYSTEM

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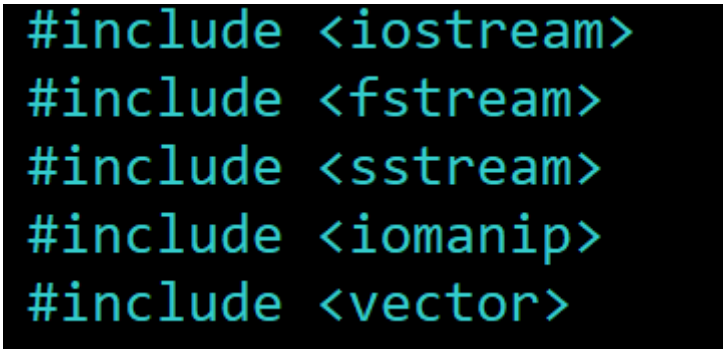
HEADER FILES:

The header files :

- **#include <iostream>:** This was used for input and output .
- **#include <vectors>:** This was used to create a resizable vector . A vector is basically a resizable array
- **#include <fstream>:** This is used to stream the content of the csv file that is used so that operations on that data can be performed.
- **#include <sstream>:** This is used stream the data of a string one at a time and perform operations on it.
- **#include <iomanip>:** This was used to adjust the output using the setw() function.

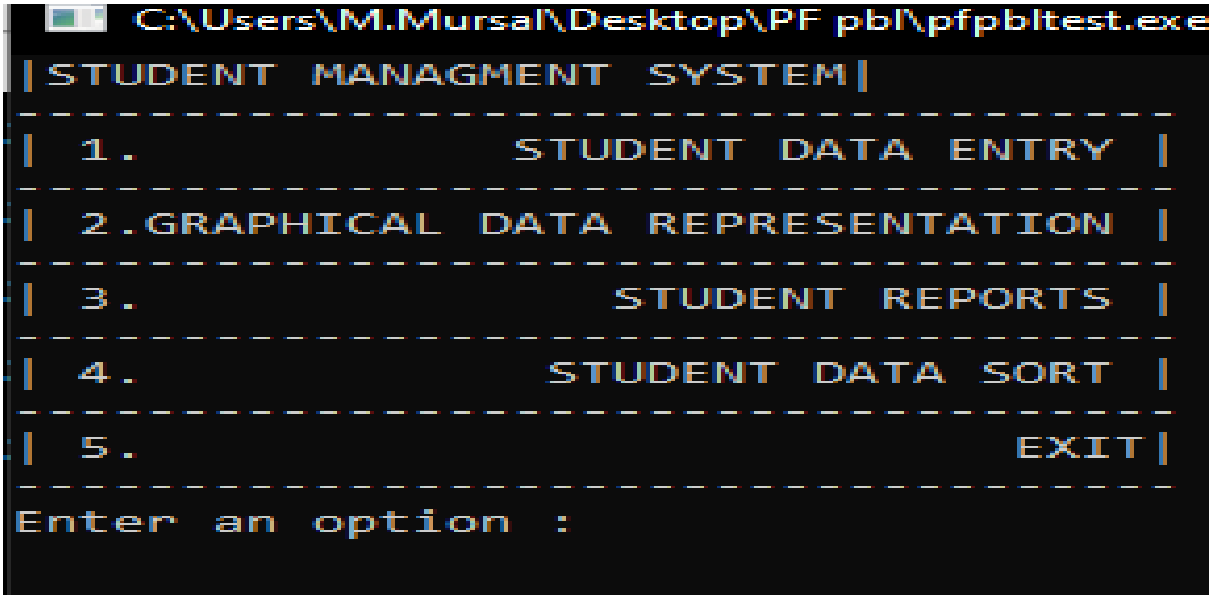


MAIN PAGE :

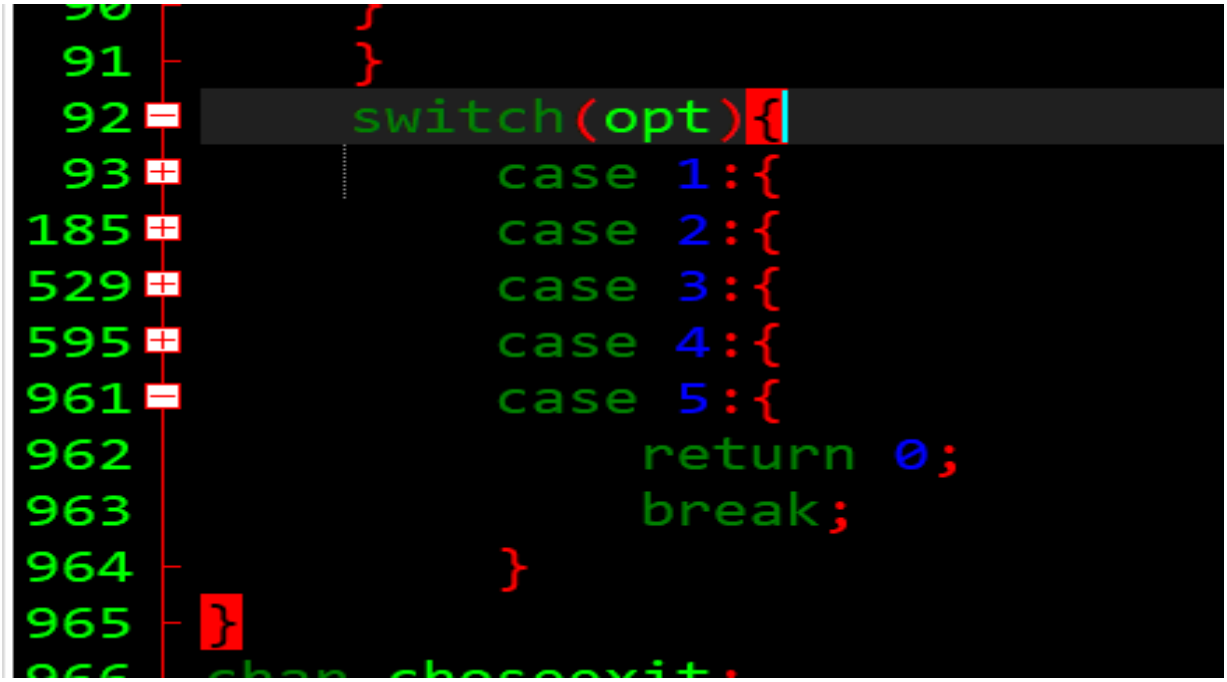
The main starting page of the code is the following. This code will also check if the entered option is correct or not.

```
cout<<"|"<<setw(24)<<"STUDENT MANAGMENT SYSTEM"<<"|\n";
char sortchk,ch;string line;int change,opt;
fstream fin;
fin.open("datasetforpbl.csv",ios::app);
while(true){
while(true){
cout<<"-----------------------------------"<<endl;
cout<<"| 1."<<setw(30)<<"STUDENT DATA ENTRY "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"| 2."<<setw(30)<<"GRAPHICAL DATA REPRESENTATION "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"| 3."<<setw(30)<<"STUDENT REPORTS "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"| 4."<<setw(30)<<"STUDENT DATA SORT "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"| 5."<<setw(30)<<"EXIT"<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"Enter an option : ";
cin>>opt;
if(opt==1||opt==2||opt==3||opt==4||opt==5){
    system("cls");
    break;
}
else{
    system("cls");
    cout<<"Enter a valid option \n";
```

This will display the following output ;



You can choose any of the following options perform operation on the data, Input the data or exit the program. The program will then execute a switch statement based on what options that you choose. The following are the compressed version of the switch statement.



DATA ENTRY :

In the data entry menu the person first get asked by how many entries does he or she want to enter in the data base.

```
    case 1:{
        int entries;string line1;
        while(true){
while(true){
cout<<"Enter how many student entries that you want to enter : ";
cin>>entries;
if((entries%1)!=0){
    cout <<"Enter a valid value ";
}
    system("cls");
    break;
}
```

After this the user will be asked to enter the **NAME , ID , CLASS** etc and the necessary checks will be performed so that the data entered is correct.

```
cout<<"Enter the id of the student (id must start with F) : ";
cin>>id;
if(id[0]!='F'){
    cout<<"Enter a valid id \n";
}
else{
    break;
}
}
```

```
    cout<<"Enter a name of the student : ";
    cin>>name;
    while(true){
    cout<<"Enter a class";
    cin>>clase;
    if(clase == "A"||clase == "B" ||clase == "C" ||clase == "D"){
        break;
    }
    else{
        cout<<"Enter a valid class \n";
    }
}
```

```
    while(true){
    cout<<"Enter the cgpa : ";
    cin>>cgpa1;
    if(cgpa1>0&&cgpa1<=4.0){
        break;
    }
    else{
        cout<<"Enter a valid cgpa \n";
    }
    }
    while(true){
    cout<<"Enter the total gpa : ";
    cin>>cgpa2;
    if(cgpa2>0&&cgpa2<=4.0){
        break;
    }
    else{
        cout<<"Enter a valid gpa \n";
    }
    }
cout<<"Enter the course grade : ";
cin>>grade1;
if(grade1!='A'||grade1!='B'||grade1!='C'||grade1!='D'||grade1!='F'){
    cout<<"Enter a valid grade \n";

}
else{
    break;
}
}
while(true){
cout<<"Enter the overall grade : ";
cin>>grade2;
if(grade1!='A'||grade1!='B'||grade1!='C'||grade1!='D'||grade1!='F'){
    cout<<"Enter a valid grade \n";
}
else{
    break;
}
}
system("cls");
fin<<id<<","<<name<<","<<clase<<","<<cgpa1<<","<<cgpa2<<","<<grade1<<","<<grade2<<"\n";
```

After all of the valid data has been entered it will then be stored in the csv file that is used to store and access the data

```
Enter the id of the student (id must start with F) : f2450
Enter a valid id
Enter the id of the student (id must start with F) : F2450
Enter a name of the student : Mursal
Enter a class : A
Enter the cgpa : 0
Enter a valid cgpa
Enter the cgpa : 2.3
Enter the total gpa : -9
Enter a valid gpa
Enter the total gpa : 3.4
Enter the course grade : W
Enter a valid grade
Enter the course grade : A
Enter the overall grade : Z
Enter a valid grade
Enter the overall grade : A
```

2	F2450	Mursal	A		3.2	3.2	A	A

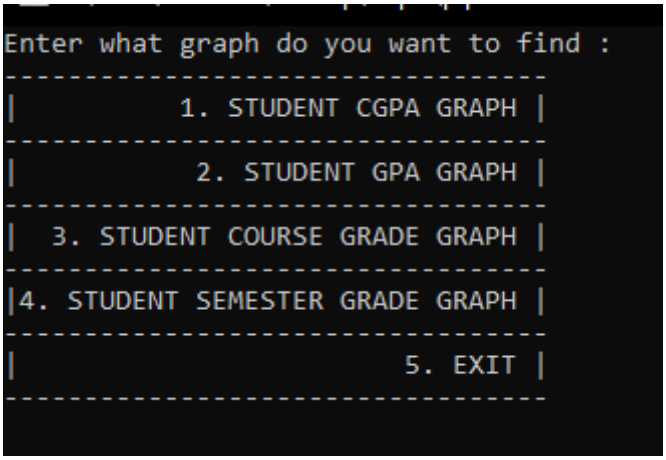
DATA GRAPHICAL REPRESENTATION :

The student data that is present in the csv file is can also be used to make a horizontal bar chart. So that it can easily be understood which class is performing better than the others Or how many students have **A grade** and how many have **D grade** compared to each other.

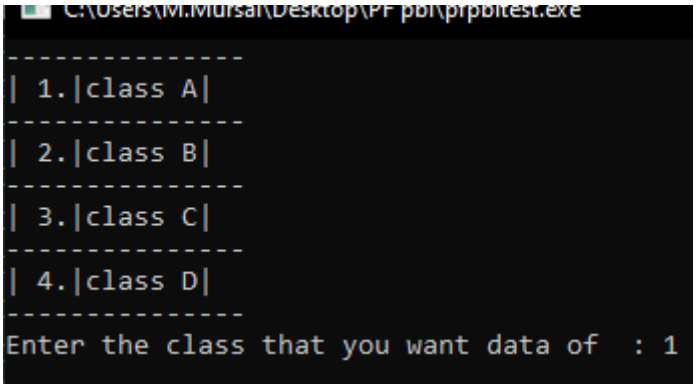
Following Is a look at the code.

```
while(true){
cout<<"Enter what graph do you want to find : "<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"|"<<setw(32)<<"1. STUDENT CGPA GRAPH "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"|"<<setw(32)<<"2. STUDENT GPA GRAPH "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"|"<<setw(32)<<"3. STUDENT COURSE GRADE GRAPH "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"|"<<setw(32)<<"4. STUDENT SEMESTER GRADE GRAPH "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cout<<"|"<<setw(32)<<"5. EXIT "<<"|"<<endl;
cout<<"-----------------------------------"<<endl;
cin>>gopt;
if(gopt=='5'){
    goto endofprogram;// exits this option.
}
else if(gopt!='1'||gopt!='2'||gopt!='3'||gopt!='4'){
    system("cls");
    cout<<"Enter a valid option : ";
    continue;
}
else{
    break;
}
```

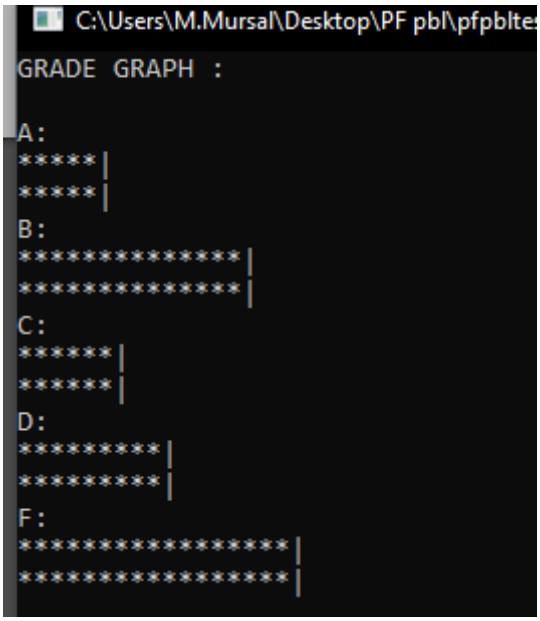
This is the menu of this section.



When choose any of the options, lets say we choose the 3rd option and press enter. The program will then ask us to enter what class do you want to find the horizontal bar graph of .



When we choose the first option the horizontal bar graph will be displayed.



This graph us showing how many students have grade **A, B, C, D** and **F** grade.

The code for this is the following :

```
    case ('3'):{
        while(getline(fin,lineg)){
    string garbage;
    stringstream sg(lineg);
    getline(sg,garbage,',');
    getline(sg,garbage,',');
    getline(sg,claser,',');
    if(claser[0]!=inclase[0]){
        continue;
    }
    getline(sg,garbage,',');
    getline(sg,garbage,',');
    getline(sg,cgpa,',');
    temp1=cgpa;
    if(temp1=="A"){
        A++;
    }
    else if(temp1=="B"){
        B++;
    }
    else if(temp1=="C"){
        C++;
    }
    else if(temp1=="D"){
        D++;
    }
    else{
        F++;
    }
}
```

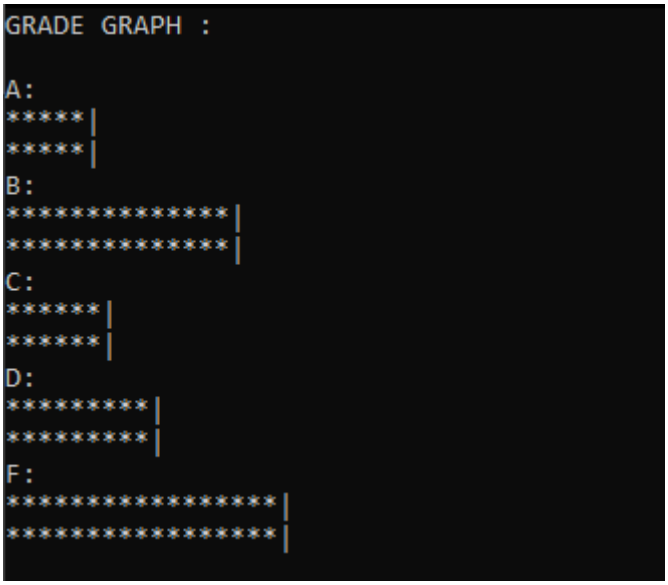
```
    cout<<"GRADE GRAPH :\n"<<endl;
cout<<"A:\n";
for(int i=0;i<2;i++){
for(int i=0;i<A;i++){
    cout<<"*";
}
cout<<"|"<<endl;
}
cout<<"B:\n";
for(int i=0;i<2;i++){
for(int i=0;i<B;i++) {
    cout<<"*";
}
cout<<"|"<<endl;
}
cout<<"C:\n";
for(int i=0;i<2;i++){
for(int i=0;i<C;i++) {
    cout<<"*";
}
cout<<"|"<<endl;
}
cout<<"D:\n";
for(int i=0;i<2;i++){
for(int i=0;i<D;i++){
    cout<<"*";
}
cout<<"|"<<endl;
}
cout<<"F:\n";
for(int i=0;i<2;i++){
for(int i=0;i<F;i++) {
    cout<<"*";
}
cout<<"|"<<endl;
}
cout<<endl;
```

The code is basically getting the appropriate data from the csv file using the string stream and by ignoring **(,)** as the comma I used to separate each cell int the csv file like this (NAME,ROLLNO,ID etc). The code will also skip a entry in the csv file if it is not in a particular class.

After the code gets the appropriate data then it checks if the data that has been taken from the file is equal to any of the grades in this case. But in the other option it will

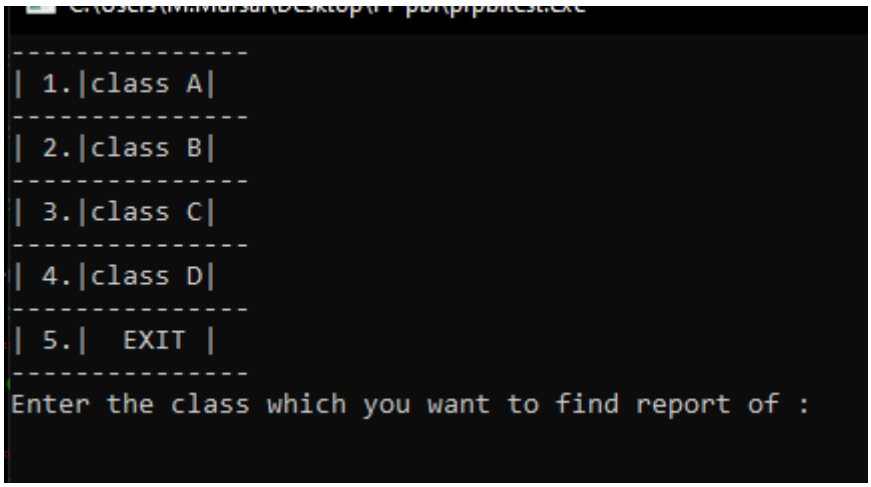
check for if the gotten data is within a gpa range like (from 4 to 3.5) . after the check for a condition the program will increment a variable based on the data.

After all the data has been checked the program will then go and print the incremented variables until a horizontal graph has been made as shown in the screenshot.



CLASS REPORT:

In the class report menu the following prompt will appear first :



The following code is used to get a option from the user and to make sure that the option that the user choose is correct. It also gives the user the option to exit this menu if he wants to.

```
string chkclas;
while(true){
cout<<"---------------"<<endl;
cout<<"|"<<setw(3)<<"1."<<"|"<<setw(7)<<"class A"<<"|"<<endl;
cout<<"---------------"<<endl;
cout<<"|"<<setw(3)<<"2."<<"|"<<setw(7)<<"class B"<<"|"<<endl;
cout<<"---------------"<<endl;
cout<<"|"<<setw(3)<<"3."<<"|"<<setw(7)<<"class C"<<"|"<<endl;
cout<<"---------------"<<endl;
cout<<"|"<<setw(3)<<"4."<<"|"<<setw(7)<<"class D"<<"|"<<endl;
cout<<"---------------"<<endl;
cout<<"|"<<setw(3)<<"5."<<"|"<<setw(7)<<"EXIT "<<"|"<<endl;
cout<<"---------------"<<endl;
cout<<"Enter the class which you want to find report of : ";
cin>>chkclas;
if(chkclas=="5"){
    goto endofprogram;
}
if(chkclas=="1"||chkclas=="2"||chkclas=="3"||chkclas=="4"){
    if(chkclas=="1"){
        chkclas="A";
    }
    else if(chkclas=="2"){
        chkclas="B";
    }
    else if(chkclas=="3"){
        chkclas="C";
    }
    else if(chkclas=="4"){
        chkclas="D";
    }
    break;
}
else{
    system("cls");
    cout<<"Enter a valid option. ";
    continue;
}
```

After this the program will execute the following code. This code will get the average cgpa ,gpa, highest cgpa and lowest cgpa in the file and of the class that was told by the user.

```
float temp1=0,temp2=0,hcgpa=0,cg=0,hgpa=0,g=0,temp11=0,temp22=0;
string garbager,claser,cgpa,gpa;

getline(fin,liner);
        while(getline(fin,liner)){
            stringstream sr(liner);
            getline(sr,garbager,',');
            getline(sr,garbager,',');
            getline(sr,claser,',');
            if(claser!=chkclas){
                continue;
            }
            getline(sr,cgpa,',');
            temp1=stof(cgpa);
            if(temp1>hcgpa){
                hcgpa=temp1;
            }
            temp11+=temp1;
            cg++;
            getline(sr,gpa,',');{
            temp2=stof(gpa);
            if(temp2>hgpa){
                hgpa=temp2;
            }
            temp22+=temp2;
            g++;
            }
        }
```

This part of the code is used to find the sum of the cgpa and gpa so that we can find the average of the particular class. It also gets the highest and the lowest gpa of the class.

```
cout<<"-------------------------------------------------------"<<endl;
cout<<"|"<<setw(8)<<"CLASS"<<"|"<<setw(8)<<"AVG CGPA"<<"|"<<setw(8)<<"AVG GPA"<<"|"<<setw(8)<<"HIGHEST CGPA"<<"|"<<setw(8)<<"HIGHEST GPA"<<"|"<<endl;
cout<<"-------------------------------------------------------"<<endl;
cout<<"|"<<setw(8)<<chkclas<<"|"<<setw(8)<<(float)temp11/cg<<"|"<<setw(8)<<(float)temp22/g<<"|"<<setw(8)<<hcgpa<<"|"<<setw(8)<<hgpa<<"|"<<endl;
cout<<"-------------------------------------------------------"<<endl;
```

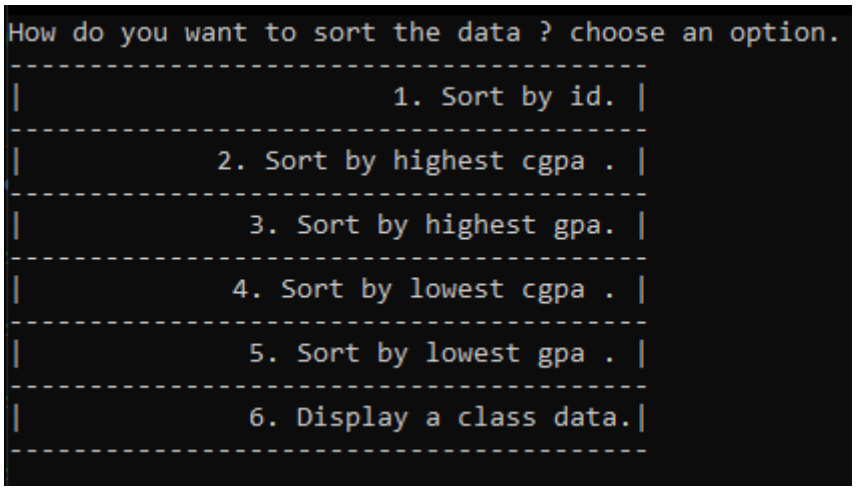
This part of the code is used to print out the average , highest and lowest gpa of the class.

The following output will appear if we chose a class from the options.

```
-------------------------------------------------------
|   CLASS|AVG CGPA| AVG GPA|HIGHEST CGPA|HIGHEST GPA|
-------------------------------------------------------
|       C|  2.2234|   2.502|    3.93|    3.97|
-------------------------------------------------------
```

DATA SORT:

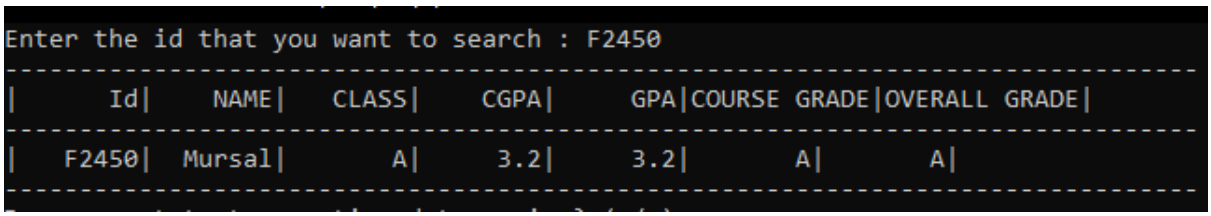
When the data sorting option is selected the following output will appear.



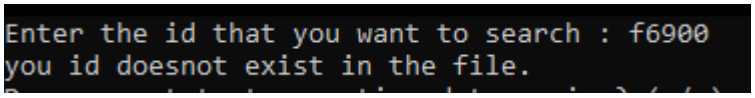
The options in the menu can be divided into 3 categories which are as following :

1. **SEARCHING USING ID:** This is used to search using the id.
2. **HIGHEST AND LOWEST GPA/CGPA SORTING:** This is used to sort he student data in an order.
3. **DISPLAYING WHOLE DATA OF CLASS:** This is used to display the whole data of the class .

When we select the first option the following prompt will appear. And if I enter a correct id it will display the following message:



If the entered id is does not exist in the file then it will display the following message:



The code for this Is the following:

```
string idf;
cout<<"Enter the id that you want to search : ";
cin>>idf;
if(idf[0]=='f'){
    int tem=idf[0];
    tem-=32;
    idf[0]=tem;
}
getline(fin,line);
while(getline(fin,line)){
    string id,name,clase,pftcgpa,pflcgpa,pftgrde,pflgrde;
    stringstream si(line);
    getline(si,id,',');
    if(idf==id){
        getline(si,name,',');
        getline(si,clase,',');
        getline(si,pftcgpa,',');
        getline(si,pflcgpa,',');
        getline(si,pftgrde,',');
        getline(si,pflgrde,',');
        cout<<"-------------------------------------------------------------------------------"<<endl;
        cout<<"|"<<setw(8)<<"Id"<<"|"<<setw(8)<<"NAME"<<"|"<<setw(8)<<"CLASS"<<"|"<<setw(8)<<"CGPA"<<"|"<<se
        cout<<"-------------------------------------------------------------------------------"<<endl;
        cout<<"|"<<setw(8)<<id<<"|"<<setw(8)<<name<<"|"<<setw(8)<<clase<<"|"<<setw(8)<<pftcgpa<<"|"<<setw(8)
        cout<<"-------------------------------------------------------------------------------"<<endl;
        break;
    }
    else{
        checker=false;
        continue;
    }
}
    if(checker==false){
        cout<<"you id doesnot exist in the file.\n";
    }
```

When we select the second option it will display the following message:

```
---------------
| 1.|class A|
---------------
| 2.|class B|
---------------
| 3.|class C|
---------------
| 4.|class D|
---------------
Enter the class that you want data of  :
```

After we choose our class it will display the data of the selected class will be displayed in the ascending order following:

ID	NAME	CLASS	CGPA	CGPA	GRADE	GRADE
F1028	Chloe	A	3.97	3.02	A	B
F1009	Isaac	A	3.93	3.37	A	B
F1040	Olivia	A	3.88	1.32	A	F
F1033	Henry	A	3.84	3.72	A	A
F1011	Kevin	A	3.62	1.9	B	F
F1005	Ethan	A	3.58	2.97	B	C
F1050	Blake	A	3.54	1.62	B	F
F1037	Liam	A	3.51	1.18	B	F
F1017	Quentin	A	3.46	3.8	B	A
F1043	Sean	A	3.45	3.38	B	B
F1045	Tyler	A	3.35	1.86	B	F
F1026	Amelia	A	3.33	1.88	B	F
F1015	Oliver	A	3.29	1.86	B	F

Following is the code. It is collecting the data and storing it in the vector using the push back command sending the data to the function which sorts the data by using another swap function and then displays it.

```
getline(fin,line);
while(getline(fin,line)){
stringstream ss(line);
char cls;
string id,name,clase,pftcgpa,pflcgpa,pftgrde,pflgrde;
getline(ss,id,',');
getline(ss,name,',');
getline(ss,clase,',');
cls=clase[0];
if(cls!=ch){
    continue;
}
getline(ss,pftcgpa,',');
getline(ss,pflcgpa,',');
getline(ss,pftgrde,',');
getline(ss,pflgrde,',');
id1.push_back(id);//id
name1.push_back(name);//name
clase1.push_back(clase);//class
float temp1=stof(pftcgpa);
pftc1.push_back(temp1);//pftcgpa
float temp2=stof(pflcgpa);
pflc1.push_back(temp2);//pflcgpa
pftg1.push_back(pftgrde);//pftgrade
pflg1.push_back(pflgrde);//pflgrade

hightolow(pftc1,pflc1,id1,name1,clase1,pftg1,pflg1);
```

```
void swaper(float &a,float &b ){
    float temp;
    temp=a;
    a=b;
    b=temp;
}
void swaper(string &a,string &b){
    string temp;
    temp=a;
    a=b;
    b=temp;
}
void hightolow(vector<float> &v1,vector<float> &v2,vecto
    for(int i=0;i<v1.size();i++){
        for(int i=0;i<v1.size()-1;i++){
            if(v1[i]<v1[i+1]){
                swaper(v1[i],v1[i+1]);
                swaper(v2[i],v2[i+1]);
                swaper(id[i],id[i+1]);
                swaper(name[i],name[i+1]);
                swaper(clase[i],clase[i+1]);
                swaper(grade1[i],grade1[i+1]);
                swaper(grade2[i],grade2[i+1]);
            }
        }
    }
```

After this the last option display the whole classes data unsorted .

THE FLOW CHART OF THIS PROGRAM IS THIS.