**LAB 8 – FUNCTION OVERLOADING**

#include<iostream>

#include<string>

using namespace std;

class Student

{

private:

string name;

int rollNo;

float marks[3];

float average;

string grade;

public:

Student(string name = "Unknown", int rollNo=0)

{

this->name = name;

this->rollNo = rollNo;

for (int i = 0; i < 3; i++)

{

marks[i] = 0.0;

}

this->average = 0.0;

this->grade = "F";

}

Student(string name, int rollNo, float mark1, float mark2, float mark3)

{

this->name = name;

this->rollNo = rollNo;

this->marks[0] = mark1;

this->marks[1] = mark2;

this->marks[2] = mark3;

this->average = 0.0;

this->grade = "F";

}

Student(const Student &student)

{

name = student.name;

rollNo = student.rollNo;

for (int i = 0; i < 3; i++)

{

marks[i] = student.marks[i];

}

average = student.average;

grade = student.grade;

}

void calculateAverage()

{

float total = 0;

for (int i = 0; i < 3; i++)

{

total += marks[i];

}

average = total / 3;

}

void calculateGrade()

{

if (average >= 90)

{

grade = "A+";

} else if (average >= 80)

{

grade = "A";

} else if (average >= 75)

{

grade = "B+";

} else if (average >= 70)

{

grade = "B";

} else if (average >= 60)

{

grade = "C";

} else

{

grade = "F";

}

}

void displayDetails()

{

cout << "\nStudent Name: " << name << endl;

cout << "Roll Number: " << rollNo << endl;

}

void displayDetails(bool showMarks)

{

cout << "\nStudent Name: " << name << endl;

cout << "Roll Number: " << rollNo << endl;

if (showMarks)

{

cout << "Marks in 3 subjects:";

for (int i = 0; i < 3; i++)

{

cout << " " << marks[i];

}

cout << endl;

}

}

void displayDetails(bool showMarks, bool showGrade)

{

displayDetails(showMarks);

if (showGrade)

{

cout << "Average Marks: " << average << endl;

cout << "Grade: " << grade << endl;

}

}

};

int main()

{

const int numStudents = 3;

Student students[numStudents];

for (int i = 0; i < numStudents; i++)

{

string name;

int rollNo;

float mark1, mark2, mark3;

cout << "Enter details for student " << (i + 1) << ":\n";

cout << "Name: ";

cin >> name;

cout << "Roll Number: ";

cin >> rollNo;

cout << "Marks in 3 subjects (separated by spaces): ";

cin >> mark1 >> mark2 >> mark3;

students[i] = Student(name, rollNo, mark1, mark2, mark3);

}

for (int i = 0; i < numStudents; i++)

{

students[i].calculateAverage();

students[i].calculateGrade();

}

cout <<"\nBasic Details of Students:";

for (int i=0; i < numStudents; i++)

{

students[i].displayDetails();

}

cout << "\n\nDetailed Information of Students:";

for (int i = 0; i < numStudents; i++)

{

students[i].displayDetails(true);

}

cout << "\n\nFull Information of Students:";

for (int i = 0; i < numStudents; i++)

{

students[i].displayDetails(true, true);

}

return 0;

}