```java
public class Student {
    private String f_name;
    private String M_name;
    private String l_name;
    private String[] courses;
    private char[] grades;
    private double[] degree;
    private double[] credit_hours;
    private char gender;
    private double gpa;
    private int age;
    private static int no_of_students;

    // Constructors
    public Student(){
    f_name = " ";
    M_name = " ";
    l_name = " ";
    courses = null;
    grades = null;
    degree = null;
    credit_hours = null;
    gender = ' ';
    gpa = 0;
    age = 0;
    no_of_students++;
    }

    public Student(String f, String m, String l){
        f_name = f;
        M_name = m;
        l_name = l;
        courses = null;
        grades = null;
        degree = null;
        credit_hours = null;
        gender = ' ';
        gpa = 0;
        age = 0;
        no_of_students++;
    }

    public Student(String f, String m, String l, int a){
        f_name = f;
        M_name = m;
        l_name = l;
        courses = null;
        grades = null;
        degree = null;
        credit_hours = null;
        gender = ' ';
```

```
        gpa = 0;
        age = a;
        no_of_students++;
    }

    public Student(String f, String m, String l, int a, char g){
        f_name = f;
        M_name = m;
        l_name = l;
        courses = null;
        grades = null;
        degree = null;
        credit_hours = null;
        gender = g;
        gpa = 0;
        age = a;
        no_of_students++;
    }

    public Student(String f, String m, String l, char g){
        f_name = f;
        M_name = m;
        l_name = l;
        courses = null;
        grades = null;
        degree = null;
        credit_hours = null;
        gender = g;
        gpa = 0;
        age = 0;
        no_of_students++;
    }

    // Setters
    public void setName(String f, String m, String l){
        f_name = f;
        M_name = m;
        l_name = l;
    }

    public void setAge(int a){
        age = a;
    }

    public void setGender(char g){
        gender = g;
    }

    public void setCourses(String[] arr){
        courses = arr.clone();
    }
```

```java
public void setGrades(char[] arr){
    grades = arr.clone();
}

public void setDegree(double[] arr){
    degree = arr.clone();
}

public void setCredit_Hours(double[] arr){
    credit_hours = arr.clone();
}


// Getters
public String getFullName(){
    return f_name + " " + M_name.charAt(0) + "." + l_name;
}

public int getAge(){
    return age;
}

public int getNo_of_students(){
    return no_of_students;
}

public double getGPA(){
    return gpa;
}

public String[] getCourses(){
    return courses;
}

public char[] getGrades(){
    return grades;
}

public double[] getDegrees(){
    return degree;
}

public double[] getCredit_Hours(){
    return credit_hours;
}

public char getGender(){
    return gender;
}
```

```
    public int getNumberofCourses(){
        if (courses == null) return 0;
        else return courses.length;
    }

    // Other Function
    public void show1(){
        System.out.println("Hello, " + getFullName());
    }

    public void show2(){
        if (courses!=null && grades!=null && degree!=null && credit_hours!=null){
            for (int i = 0; i < courses.length; i++){
                System.out.println(courses[i]+ "\t" + grades[i] + "\t" +
credit_hours[i] + "\t" + degree[i]);
            }
        }else{
            System.out.println("No courses found");
        }
    }

    public void show3(){
        System.out.println("Full Name \t: " + getFullName());
        System.out.println("Gender \t\t: " + getGender());
        System.out.println("Age \t\t: " + getAge());
        System.out.println("GPA \t\t: " + getGPA());
        System.out.println("ID \t\t: " + getNo_of_students());
        System.out.println("No_courses\t: " + getNumberofCourses());
    }

    public void calcGrade(double[] arr){
        grades = new char[arr.length];
        for (int i = 0; i < arr.length; i++){
            grades[i] = (arr[i]>85)? 'A':(arr[i]>75)? 'B':(arr[i]>65)?
'C':(arr[i]>55)? 'D':'F';
        }
    }

    public void calcGPA(char[] arr1, double[] arr2){
        double sum1 = 0, sum2 = 0;
        for (int i = 0; i < arr1.length; i++){
            switch(arr1[i]){
                case 'A': sum1 += (4.0 * arr2[i]); break;
                case 'B': sum1 += (3.2 * arr2[i]); break;
                case 'C': sum1 += (2.4 * arr2[i]); break;
                case 'D': sum1 += (1.4 * arr2[i]); break;
                case 'F': sum1 += (1.0 * arr2[i]); break;
            }
            sum2 += arr2[i];
        }
        gpa = sum1 / sum2;
```

```
    }

    // Main
    public static void main(String[] args){
        Student Ahmed = new Student();
        Ahmed.show2();
        Ahmed.show3();

        Ahmed.setName("Ahmed", "Hatem", "Mohammed");
        Ahmed.show1();

        Ahmed.setGender('M');
        Ahmed.setAge(19);
        Ahmed.show3();

        String[] courses = {"Databases", "OO Programming", "System analysis",
"Mathematics", "Discrete", "Data Comm"};
        double[] degrees = {85.5, 92, 86, 65, 75.5, 50};
        double[] credits = {3, 3, 2, 3, 1, 3};
        Ahmed.setCourses(courses);
        Ahmed.setDegree(degrees);
        Ahmed.setCredit_Hours(credits);

        Ahmed.calcGrade(degrees);
        Ahmed.show2();

        Ahmed.calcGPA(Ahmed.getGrades(), Ahmed.getCredit_Hours());
        Ahmed.show3();
    }
}
```