

Task 3

By Seif El-Din Sweilam *Section 2*

Description

- Design and implement a `struct` for the students
- Student is identified by an ID, a name, a gender, and his courses
- Define a `struct` for courses which includes the course code, name and degree
- Define all required attributes, setters, getters, methods and indexers *if needed*
- In main method, Print course data for each student (using indexers)

Implementation

Student struct

```
struct Student {
    private int id;
    private string name;
    private string gender;
    private Course[] courses;

    public Student(int id, string name, string gender, params Course[] courses) {
        this.id = id;
        this.name = name;
        this.gender = gender;
        this.courses = courses;
    }

    public int ID {
        set { id = value; }
        get { return id; }
    }

    public string Name {
        set { name = value; }
        get { return name; }
    }

    public string Gender {
        set { gender = value; }
        get { return gender; }
    }

    public int CoursesCount {
        get { return courses.Length; }
    }
}
```

```

    }

    public Course? this[string code] {
        get {
            foreach (Course course in courses) {
                if (course.Code == code) {
                    return course;
                }
            }
            return null;
        }
    }

    public double OverallDegree {
        get {
            return courses.Sum((course) => course.Degree) / courses.Length;
        }
    }
}

```

Course struct

```

struct Course {
    string code;
    string name;
    double degree;

    public Course(string code, string name, double degree) {
        this.code = code;
        this.name = name;
        this.degree = degree;
    }

    public string Code {
        set { code = value; }
        get { return code; }
    }

    public string Name {
        set { name = value; }
        get { return name; }
    }

    public double Degree {
        set { degree = value; }
        get { return degree; }
    }
}

```

Program class

```

class Program {
    public static void Main() {
        Course math1 = new Course("BAS01", "Math 1", 78);
        Course math2 = new Course("BAS02", "Math 2", 82);
        Course physics1 = new Course("BAS11", "Physics 1", 80);
        Course physics2 = new Course("BAS11", "Physics 2", 76);
        Course programming = new Course("CSE01", "Introduction to Programming", 100);
        Student seif = new Student(1, "Seif El-Din Sweilam", "male", math1, physics1, math2, physi

        DisplayStudent(seif, "BAS11", "CSE01");

        System.Console.WriteLine();

        Course math3 = new Course("BAS03", "Math 3", 71);
        Course math4 = new Course("BAS04", "Math 4", 80);
        Course control = new Course("CSE11", "Control Systems 1", 78);
        Course os = new Course("CSE21", "Operating Systems 1", 95);
        Course skills = new Course("GEN01", "Skills", 85);
        Student mohamed = new Student(2, "Mohamed Abdelfatah Selim", "male", math3, math4, control

        DisplayStudent(mohamed, "BAS03", "CSE11", "CSE21");
    }

    private static void DisplayStudent(Student student, params string[] codes) {
        System.Console.WriteLine("-----");
        System.Console.WriteLine("| ID: {0, 32} |", student.ID);
        System.Console.WriteLine("| Name: {0, 30} |", student.Name);
        System.Console.WriteLine("| Gender: {0, 28} |", student.Gender);
        System.Console.WriteLine("| Degree: {0, 28} |", student.OverallDegree);
        System.Console.WriteLine("-----");

        foreach (string code in codes) {
            Course? course = student[code];
            if (course != null) {
                System.Console.WriteLine("| Code: {0, 30} |", ((Course) course).Code);
                System.Console.WriteLine("| Name: {0, 30} |", ((Course) course).Name);
                System.Console.WriteLine("| Degree: {0, 28} |", ((Course) course).Degree);
                System.Console.WriteLine("-----");
            }
        }
    }
}

```

Runtime

```

-----
| ID:                               1 |
| Name:          Seif El-Din Sweilam |
| Gender:                               male |

```

Degree:	83.2	
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Code:	BAS11	
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Name:	Physics 1	
-------	-----------	--

Degree:	80	
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Code:	CSE01	
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Name:	Introduction to Programming	
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Degree:	100	
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ID:	2	
-----	---	--

Name:	Mohamed Abdelfatah Selim	
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Gender:	male	
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Degree:	81.8	
---------	------	--

Code:	BAS03	
-------	-------	--

Name:	Math 3	
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Degree:	71	
---------	----	--

Code:	CSE11	
-------	-------	--

Name:	Control Systems 1	
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Degree:	78	
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Code:	CSE21	
-------	-------	--

Name:	Operating Systems 1	
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Degree:	95	
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