

CSC 113

Tutorial 1

Arrays Review

Student

+id : int

+name : String

+Student(id : int , name : String)

Constructor should assign values to corresponding attributes.

```
public class Student {  
  
    public int id;  
    public String name;  
  
    public Student(int id, String name)  
    {  
        this.id = id;  
        this.name = name;  
    }  
  
}
```

Student
+id : int +name : String
+Student(id : int , name : String)

StudentSection

-students[] : Student

-currentSize : int

+StudentSection()

+addStudent(id : int , name :
String) : boolean

+search(id : int) : int

+deleteStudent(id : int) : boolean

+display() : void

Declare the Class.

```
public class StudentSection {
```

```
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

students is an array of objects of type Student. max size is 25.

currentSize represent the current size of the students in the array.

```
public class StudentSection {  
  
    private Student[] students;  
    private int currentSize;  
  
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

No-argument constructor initializes *students* and *currentSize*.

```
public StudentSection()  
{  
    students = new Student[25];  
    currentSize = 0;  
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

Adds a Student's data at the end of the array.

```
public boolean addStudent(int id, String
name)
{
    if(currentSize<= students.length)
//Space check
    {
        students[currentSize++] = new
            Student(id, name);
//New student added.
        return true;
    }
    else
        return false; //Array is full.
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

Search for a student with the given id.
returns index of the student or -1 if not found.

```
public int search(int id)
{
    int i;
    for(i=0; i<currentSize; i++)
        if(students[i].id == id)
            return i;//found
    //if the loop finish that
    //means it does not exist
    return -1;
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

Deletes the student with the given id and replace his position with the last student. if student does not exist return **false** otherwise **true**.

```
public boolean deleteStudent(int id)
{
    int i = search(id);
    if(i == -1)
        return false;
    //replace the deleted element
    //with the last one in the array
    students[i]=
        students[--currentSize];
    students[currentSize] =
        null;
    return true;
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

Display all students in the array in the following format:
index - id - Name

```
public void display()
{
    int i;
    for(i=0; i<currentSize; i++)
    {
        System.out.println(i
            +" - "+students[i].id
            +" - "+students[i].name);
    }
}
```

StudentSection
-students[] : Student -currentSize : int
+StudentSection() +addStudent(id : int , name : String) : boolean +search(id : int) : int +deleteStudent(id : int) : boolean +display() : void

Main

```
public static void main(String[] args) {  
    // TODO Auto-generated method stub  
    StudentSection csc113 = new StudentSection();  
    System.out.println("i = id = name =====");  
    csc113.addStudent(20, "Ali");  
    csc113.addStudent(30, "Saleh");  
    csc113.addStudent(40, "Faisal");  
    csc113.addStudent(50, "Majed");  
    csc113.display();  
  
    System.out.println("\nAfter Delete");  
    System.out.println("i = id = name =====");  
    csc113.deleteStudent(30);  
    csc113.display();  
}
```

Output

```
i = id = name =====  
0 - 20 - Ali  
1 - 30 - Saleh  
2 - 40 - Faisal  
3 - 50 - Majed
```

After Delete

```
i = id = name =====  
0 - 20 - Ali  
1 - 50 - Majed  
2 - 40 - Faisal
```