

Arrays in Visual C#.NET

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Arrays in General

- ☞ **Arrays** are used to store multiple data elements (or Objects)
- ☞ **foreach** Loops are usually used to access Array elements
- ☞ Individual elements can be retrieved directly using an **index value**
- ☞ **const** should be used to define ARRAY index bounds

Declaring Arrays

```
private | public dataType[size]  
    array_name = {value1, value2...}
```

```
private string[] names =  
    {"Gina", "Jane", "Joyce" }
```

```
Int[] marks = {0, 75, 83, 91}
```


```
String[] grades = new String[20];
```

Example Array

```
const int LAST_MONTH = 11;
double[] rainfall = new double[LAST_MONTH];
double total = 0;

rainfall[0] = 12.3;
rainfall[1] = 18.3;
...
rainfall[11] = 22.3;

for {int month = 0; month <= LAST_MONTH; month++}
{
    total = total + rainfall[month];
}
```



Enumerations

```
public enum Month: byte
{
    January,
    February,
    March,
    ...
    December
}
```

```
private Month month = Month.January;
```

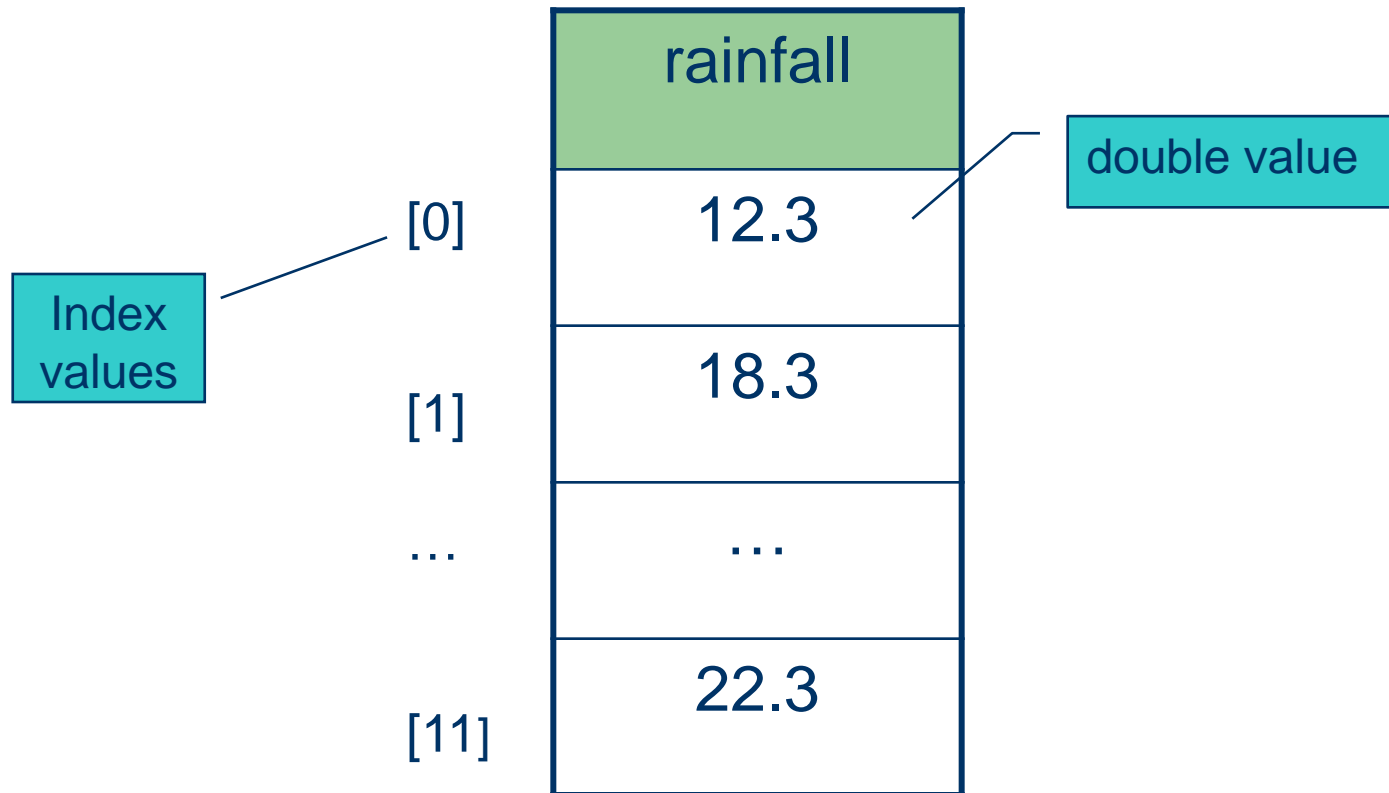
Using Enumerations

```
const Month LAST_MONTH = Months.December;  
double[] rainfall = new double[LAST_MONTH];  
double total = 0;
```

```
rainfall(Month.January) = 12.3;  
rainfall(Month.February) = 18.3;  
...  
rainfall(Month.December) = 22.3;
```

```
foreach(double figure in rainfall)  
{  
    total += figure;  
}
```

Single Dimension Arrays



Arrays with 2 Dimensions

```
const LAST_STUDENT = 6;  
const LAST_ASSESSMENT = 4;  
  
string[][] grades = new  
    string[LAST_STUDENT,  
           LAST_ASSESSMENT];  
  
grades[2, 3] = "Merit";
```


Example 2D Array

	Grades				
[0]	P	M	M	D	D
[1]	M	P	D	M	P
[2]	M	M	P	P	D
[3]	M	M	M	D	D
[4]	D	D	D	D	D
[5]	P	P	P	P	M
[6]	M	M	M	D	D
	[0]	[1]	[2]	[3]	[4]

Relating Data Items

	students		assessments
[0]	"Gloria"	[0]	"Database 1"
[1]	"Gina"	[1]	"Database 2"
[2]	"Gaynor"	[2]	"HCI 1"
[3]	"Greta"	[3]	"HCI 2"
[4]	"Gita"	[4]	"HCI 3"
[5]	"Georgina"		

classes

```
public class Student
{
    public readonly string name;
    public string[] grades =
        new string[10];
    public Student(string name)
    {
        this.name = name;
    }
}
```

Using an Array of objects

```
Student[] students = new Student[16];
```

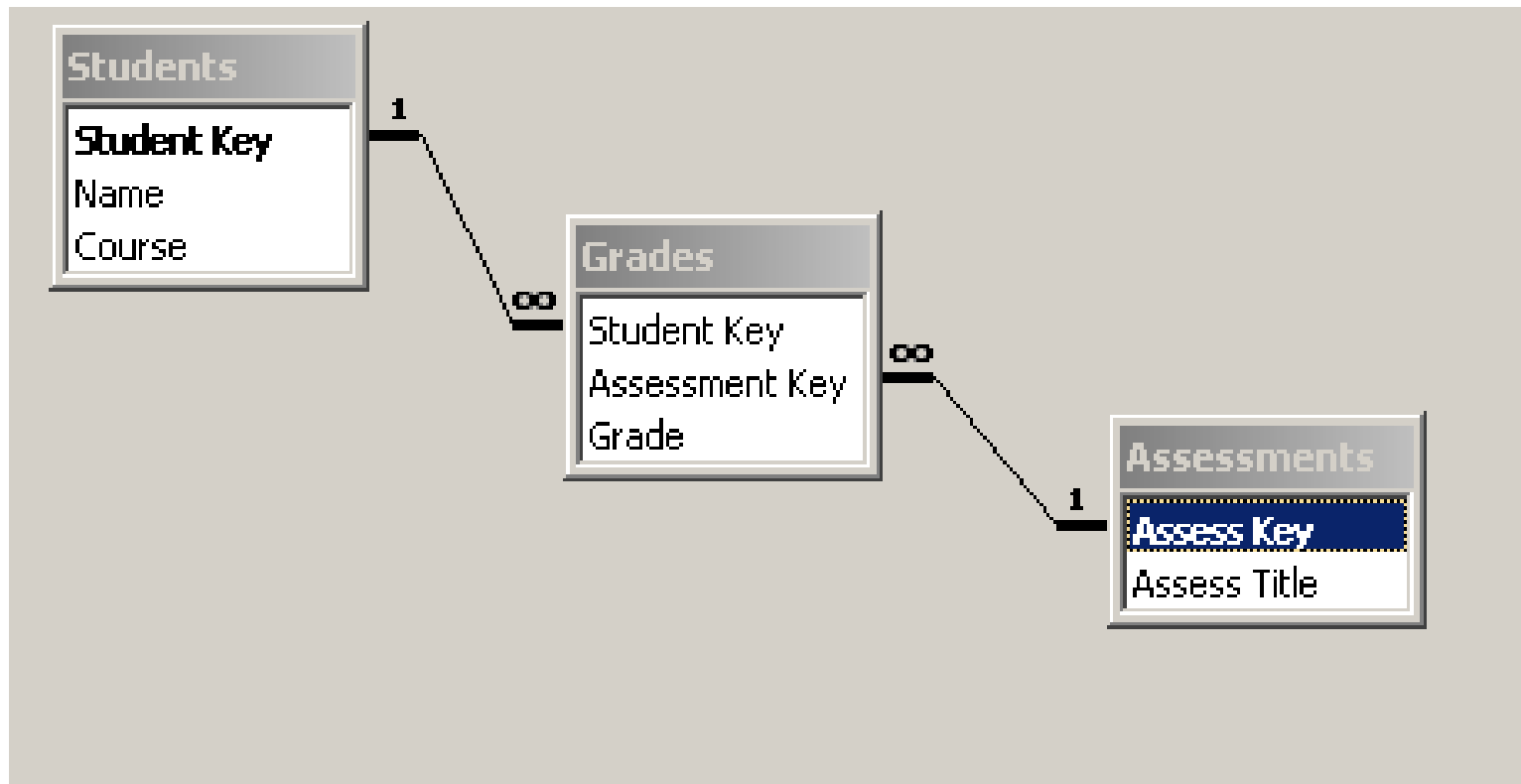
```
Student student =  
    new Student( "Derek" );
```

```
student.grades[0] = "Merit";
```

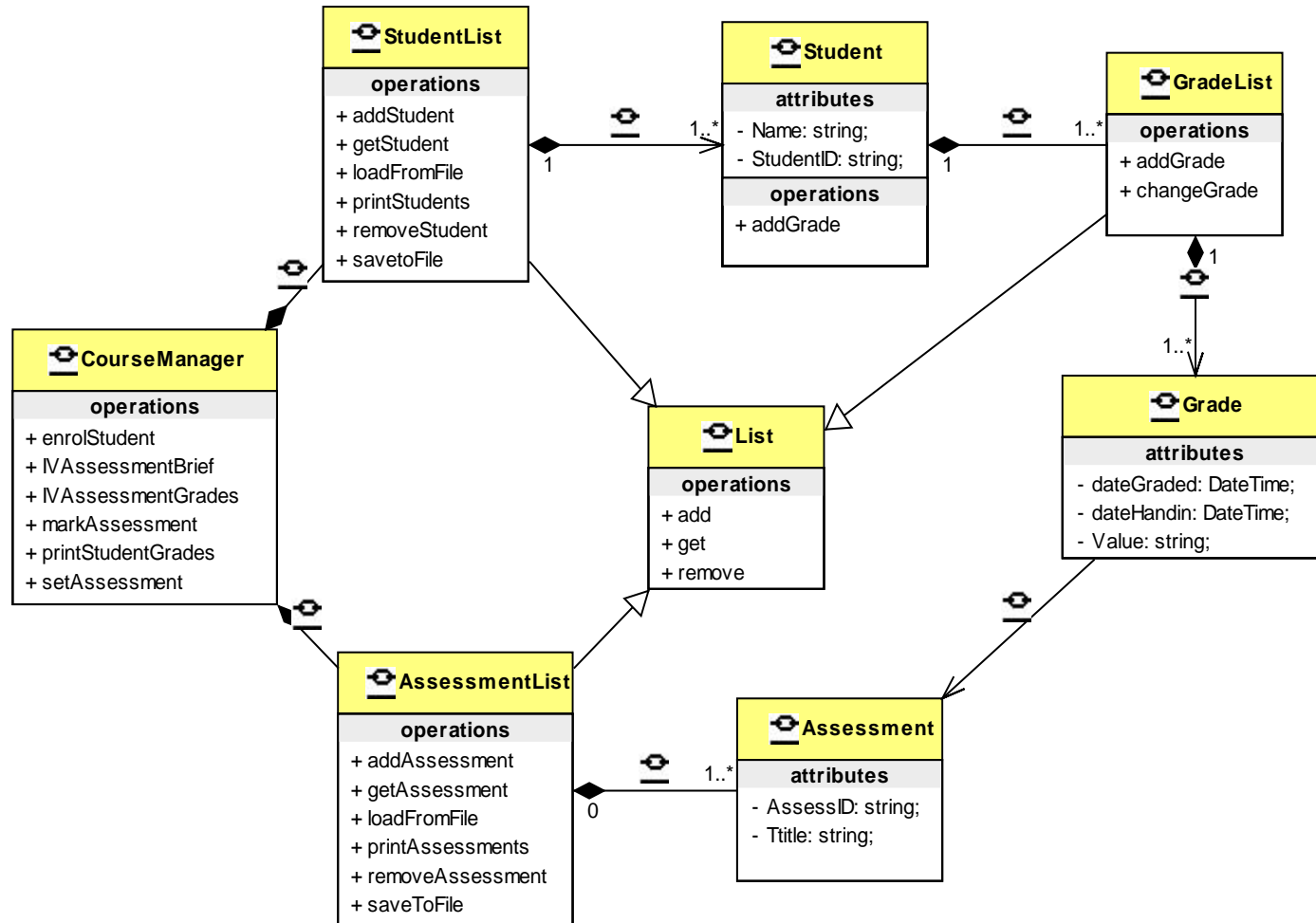
```
students[0] = student;
```

```
int noStudents = students.Length;
```

Student Grade Tables



Student Grade Classes



References

- ““Microsoft Visual C# Step by Step”
by John Sharp (2014)
Microsoft Press £19 (£14 Kindle)
- Chapter 9-10