

Computer Science 22: Object Oriented Programming

Lecture #7: Java Programming

About This Lecture

- Variable Declarations
- Array Declarations and Initialization
 - One Dimensional Array
 - Multidimensional Array
- Method Declaration
- Method Calls

Variable Declarations

- For instance/member variables

```
[access modifier] [other modifiers]  
type variableName [=initValue]  
[, otherVariable...];
```

- For local variables

```
[other modifiers]  
type variableName [=initValue]  
[, otherVariable...];
```

Variable Declarations

- Access Modifiers: public, private, protected (or default/none) – to be discussed in another lecture
- Other modifiers
 - **final** : makes the variable a constant
 - **static** : makes the variable a **class variable**
 - **transient** : variable is not to be serialized
 - **volatile** : rarely used

Variable Declarations: Example

```
public int x;
```

```
public int y = 0;
```

```
private char var1, aLetter, m;
```

```
String s1="", s2="A string literal";
```

```
static final double PI = 3.1416;
```

```
static int POPULATION = 0;
```

Variable Declarations

- For instance variables, if not explicitly initialized, they will take on default values:
 - For numeric types : **0** (zero)
 - For char type : **"** (null character)
 - For boolean : **false**;
 - For object and array types : **null**

Array Declarations

- Modifiers from variable declarations may also apply

```
[modifiers] type ([])  
arrayVariableName ([]) [= new  
type[arraySize]];
```

Array Declarations: Example

```
int myArray[];
```

```
//may be written int[] myArray;
```

```
float anotherArray[] = new float[100];
```

```
//may be written float[] anotherArray = new float[100];
```

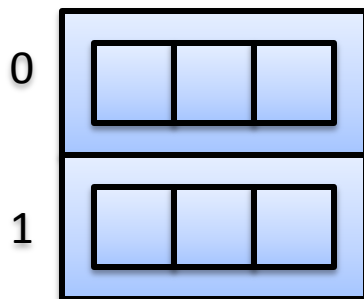

Array Declarations

- For initialized arrays (i.e., size specified), values of each element of the array are initialized similar to how non-array variables are initialized
 - i.e.,
 - For numeric types : **0** (zero)
 - For char type : **"** (null character)
 - For boolean : **false**;
 - For object and array types : **null**
- Zero-based (integer-based) indexing

Array Declarations

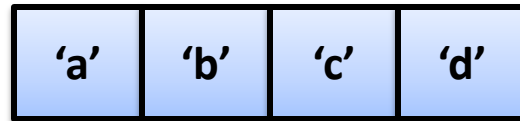
- Multidimensional arrays in Java are “Array of arrays”
- Each array within an array may be similarly or dissimilarly sized (non-rectangular)

```
int a1 [][] = new int [2][3];
```



Array Declaration and Initialization

```
char[] alph = { 'a', 'b', 'c', 'd' };
```



Array Declaration and Initialization

//multidimensional

```
int x[][] = {{1,2}, {3, 4, 5}, {6}}
```

	0	1	2
0	1	2	
1	3	4	5
2	6		

Array Declaration and Initialization

//another multidimensional

```
boolean matrix[][][] = {{{true,  
    false}, {true, true}}, {{true}}}
```

?