3. Fundamentals of Java Programming

Lesson 3:
Arrays -Part1

UCSC

BIT

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3.6. Arrays

- Arrays provide a way of storing a list of variables of the same data type, one after the other

- Arrays must be declared. For example, an array of 10 integers might be declared as:

    int[] a = new int[10];

- Elements of an array can be accessed by indicating the index (position) of the element in the array inside square brackets. Indexing (Position numbering) begins with 0.

- For example, to access the first element in an array, **a[0]**, the second element **a[1]**, and so on.

3.6. Arrays

3.6.1. Declaring array Variables

– Arrays are declared using enclosing square brackets.

Type

String Names [ ];

int Numbers [ ];

char [ ] Vowels;

Array Name

Placement of bracket can be in either way
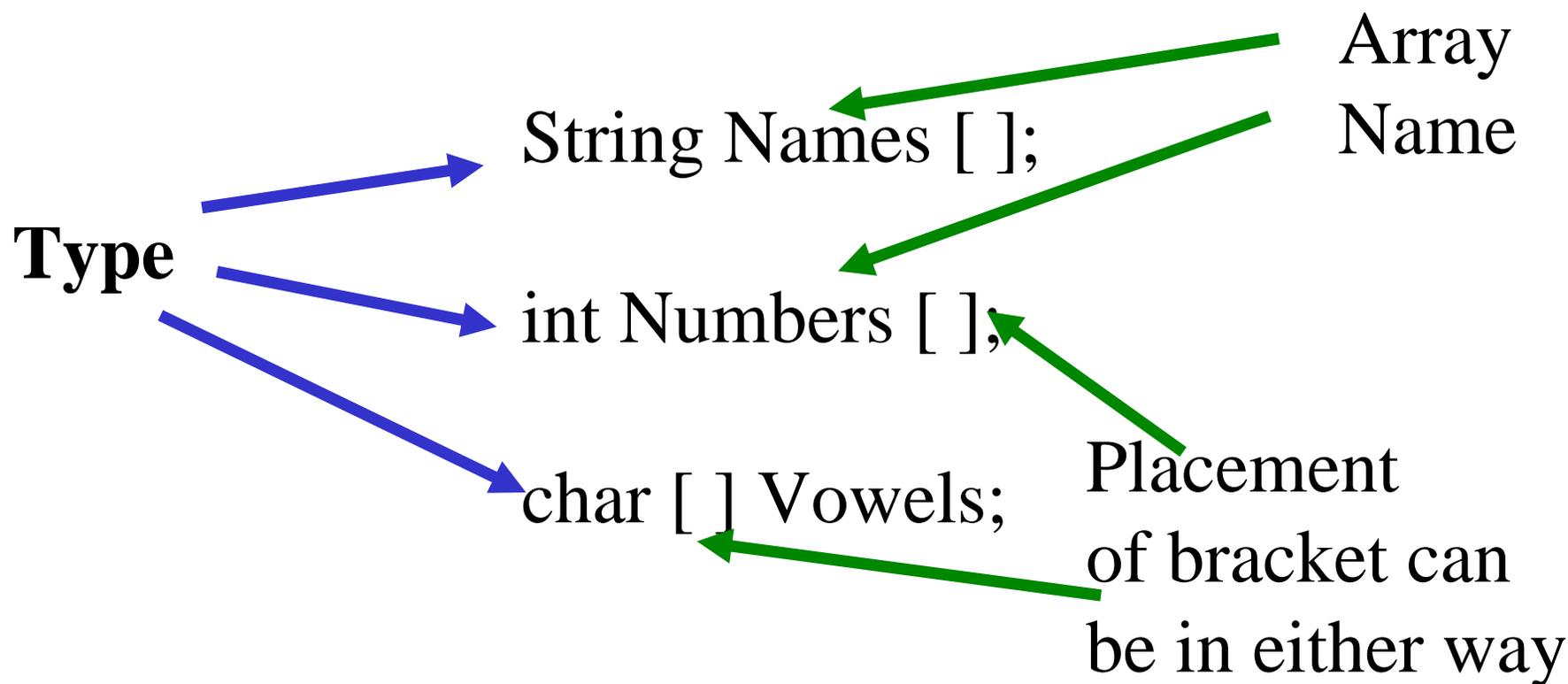
3.6. Arrays

3.6.2. Declaring array Variables cont...

– By placing the bracket before the Array Name

- we can declare multiple arrays of same type in the same line.

int [ ] firstArray, secondArray ;
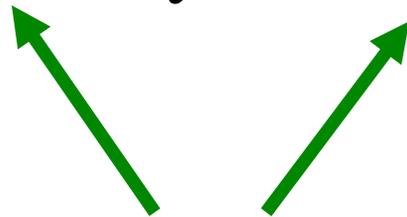
Both are arrays of
Type int

3.6. Arrays

3.6.3. Declaring array Variables cont …

– By placing the bracket after the Array Name

- we can declare variables and arrays of same Type in the same line.

$$int \ \ firstArray[\ ], justAVariable \ ;$$

Array of Type int   Variable of Type int

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- if the return type is an array object,
    - the square brackets can go after the return type or after the parameter list

<div align="center">

int [ ] **SortedList** (int List [ ]);

OR

int **SortedList** (int List [ ]) [];

</div>

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3.6.4. Creating Array Objects

- Array Objects can be created using two methods.
  - Using the **new** operator
  - Directly Initializing the contents

Number of elements

String firstName [ ] = **new** String [5];

String firstName [ ] = { "Kamal", "Amal" , "Nimal "Saman", "Sunil" } ;

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3.6.5. Accessing Array elements

– After initializing, Array elements can be accessed using subscript expression ([ ]) .

Subscript starts with 0 ends with 4

firstName [subscript];

Array with 5 elements

Example:
firstName[0] will give "Kamal"
firstName[1] will give "Amal"
firstName[2] will give "Nimal"

3.6. Arrays

3.6.5. Accessing Array elements (continued)

- Java **Run Time** will check to verify that the Array bounds are not exceeded

- Each array object has a property called **length** which will **yield the size** of Array

Example

firstName[5] will throw an **Exception**

firstName.length will yield 5

maximum subscript is always **firstName.length -1**

3.6. Arrays

3.6.6.Changing Array elements

– To change an Array Element,

- just use an assignment statement after the Array Access Expression

Example

firstName[3] = "Kamala";

now the element 3 will contain value "Kamala"