SILVER OAK UNIVERSITY

EDUCATION TO INNOVATION

SUBJECT: - Core Java

TOPIC: - Unit-2

FACULTY NAME: - Dr.Nikunj K Raval

Arrays in JAVA

- Array is collection of related data items
- Creating an array
  - Declare an array
  - Create memory location
  - Putting values to memory locations

Declaring an Array Variable

- Do not have to create an array while declaring array variable
  - *<type>* [ ] variable_name;
  - *Double[ ] myList;*
  - *double myList[ ];*
- Both syntaxes are equivalent
- No memory allocation at this point

Defining an Array

Define an array as follows:

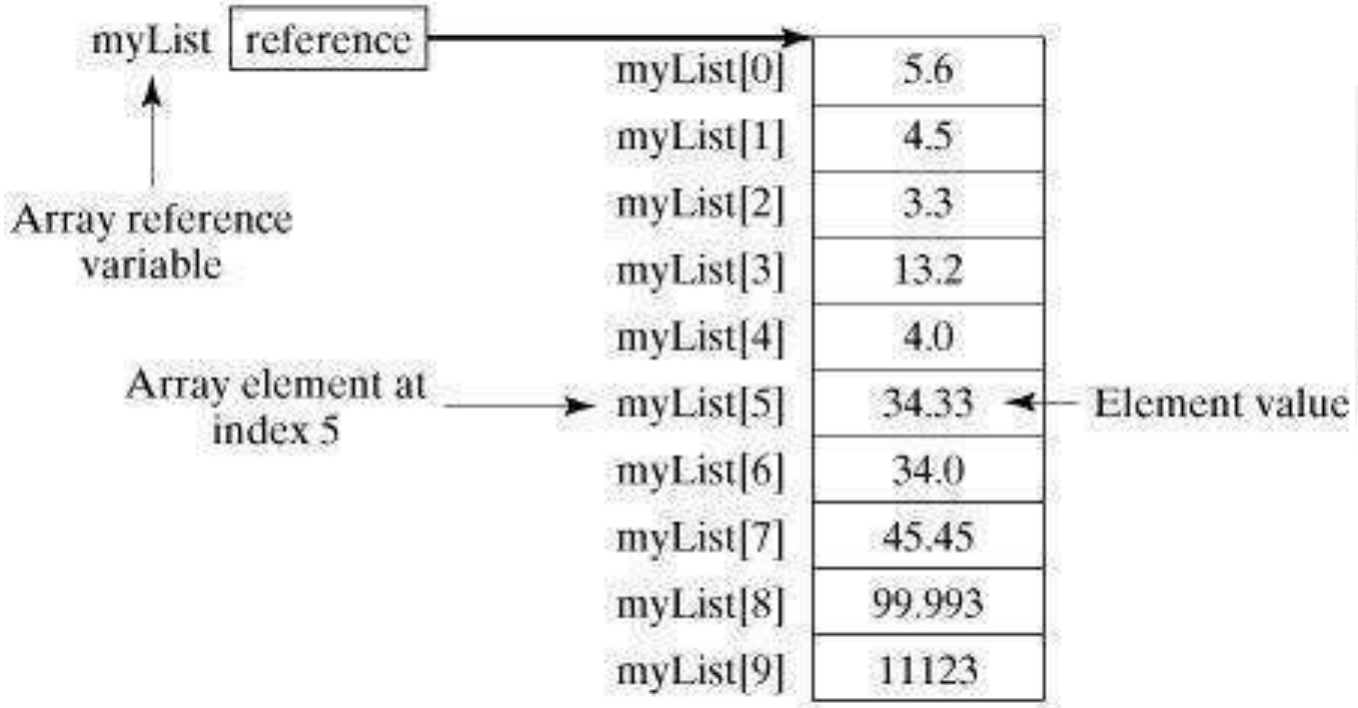
- variable_name=new <*type*>[arraySize];
- Number = new int[5];
- Mylist = new int[10];

It creates an array using new dataType[arraySize];

- It assigns the reference of the newly created array to the variable variable_name.
- dataType arrayname[ ] = {list of values};
- Int a [ ]={1,2,3,4,5,6,7,};

Array index starts from 0 to arraySize-1;

Creating arrays cntd...



What happens if we define different type…

- We define
  - Int[ ] a=new long[20];
    incompatible types
    found: long[]
    required: int[]
- The right hand side defines an array, and thus the array variable should refer to the same type of array

  Example:

  int prime[100];

  error=> ']' expected

  long primes[20];
- The C++ style is not permitted in JAVA syntax

long[] primes = new long[20];

primes[25]=33;

*Runtime Error:*Exception in thread "main"
java.lang.ArrayIndexOutOfBoundsException

Array Size through Input

….

```
BufferedReader stdin = new BufferedReader (new InputStreamReader(System.in));
String inData;
int    num;
System.out.println("Enter a Size for Array:");
inData = stdin.readLine();
num    = Integer.parseInt( inData ); // convert inData to int
long[] primes = new long[num];
System.out.println(“Array Length=”+primes.length);
```

….

SAMPLE RUN:

```
Enter a Size for Array:
4
Array Length=4
```

Example for array

```
public class TestArray {
   public static void main(String[] args) {
      double[] myList = {1.9, 2.9, 3.4, 3.5};
      // Print all the array elements
      for (double element: myList) {
         System.out.println(element);
      }
   }
}
```

Otput:

1.9
2.9
3.4
3.5

Reusing Array Variables

- int[] primes=new int[10];

  …….

  primes=new int[50];
- Previous array will be discarded
- Cannot alter the type of array

Demonstration

```
long[] primes = new long[20];
primes[0] = 2;
primes[1] = 3;
System.out.println(primes[0]);
System.out.println(primes[1]);
```

Output:

2

3

Array Length

- Refer to array length using *length() method*
  - A data member of array object
  - array_variable_name.length
  - for(int k=0; k<primes.length;k++)
- Sample Code:

```
long[ ] primes = new long[20];
System.out.println(primes.length);
```

- Output: 20
- If number of elements in the array are changed, JAVA will automatically change the length attribute!

Sample Program

```
class MinArray
{
    public static void main ( String[] args )
    {
        int[] array = { 20, 19, 1, 5, 71, 27, 19, 95 } ;
        int min=array[0]; // initialize the current minimum
        for ( int index=0; index < array.length; index++ )
          if ( array[ index ] < min )
                min = array[ index ] ;
        System.out.println("The minimum of this array is: " + min );
    }
}
```

*Program taken from: http://chortle.ccsu.edu/CS151/Notes/chap47/ch47_10.html

Two dimenssional array

- Representing 2D arrays
  - Int myarray[][];
  - Myarray = new int[3][4];
  - Int myarray [][] = new int[3][4];
- Example
- Int myarray[2][3]={0,0,0,1,1,1};

2 columns and 3 rows

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