Introduction to Arrays

BCSC 0015 Applied Data Structures and Algorithms

GLA UNIVERSITY MATHURA
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Introduction to Arrays

- Primitive variables are designed to hold only one value at a time
- Arrays allow us to create a collection of like values that are indexed.
- An array can store any type of data but only one type of data at a time

In other words we can say that an array is an indexed collection of, fixed number of, homogeneous data elements.

Creating Arrays

An array is an object so it needs an object reference.

// 1st Step - Declare a reference to an array that will hold integers.

Int [] arrayofnumbers;

// 2nd Step - create a new array that will hold 5 integers.

arrayofnumbers = new int[5]

Array element values are initialized to 0.

Array indexes always start at 0.

Creating Arrays- Cont.

It is possible to declare an array reference and create it in the same statement

// Declaring and creating in one step

int [] arr = new int[10];

Note: Once created, an array size is fixed and cannot be changed.

// Declaring , creating and initializing in one step

int arr[] = {10,20,30,40,50};

Note: Arrays may be of any type

String names[] = new String[10];

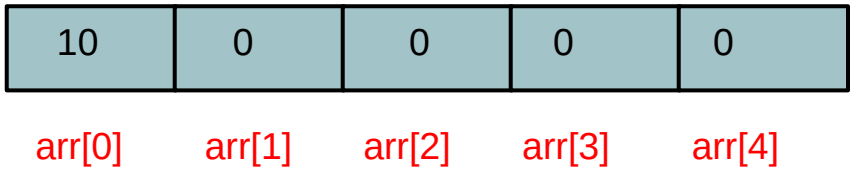
double [] sizes = new double[10];

Accessing the Elements of an array

An Array is accessed by -

- **The reference name**
- **An index that identifies which element in the array to access.**

Example :- int arr[]= new int[5];



arr[0] = 10; // value at index zero

Traversing an Array to initialize

```
Scanner s= new Scanner(System.in);  // using the scanner class to get the input from user

int [] arr = new int[10];

for(int i =0;i<10;i++) // traversing an array to initialize
{
        System.out.println("Enter a value");
        arr[i] = s.nextInt();
}
```

Traversing an Array to access values

```
for(int i =0;i<10;i++)
{
        System.out.println(arr[i]);
}
```

The Enhanced `for` Loop – an *alternative* to accessing the array

```
for(int element : arr)
{
            System.out.println(element);
}
```

Enhanced for-Loops = simplified array processing (read only)
Always goes through all elements

```
for(datatype elementVariable : array)
  { statement;}
```

The *length* field & the *length* method

- Arrays have a *final* field named **length**.
- Use the .length field to check for bounds

```
for(int i =1; i < arr.length ; i++)
{
      arr[i] = 10;
}
```

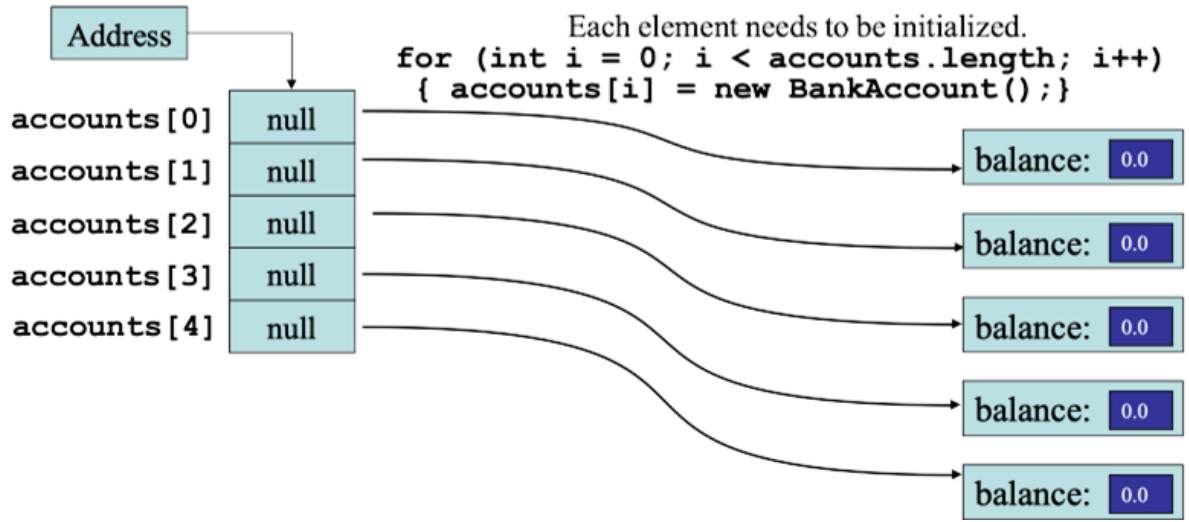
- String Objects have a method named length() to find the length of the String.

Arrays of **Objects**

This is an array of reference to BankAccount object: (Think BankAccount is a class)

BankAccount [] accounts = new BankAccount[5];

The accounts variable holds the address of an BankAccount array.



References

- Starting Out with Java: From Control Structures through Data Structures @ 2012 pearson Education
- Hyperskil Academy by jetbrains.