**Arrays:**

**Definition:**

Arrays are Objects in java that stores multiple values of same type. Arrays can hold either primitive or Object references, But arrays itself is an object even if it’s declared to hold primitive elements.

Different ways of declaring array

1.arraytype[] arrayname=New arraytype[size];

2.int arrayname[];

arrayname=new int[size];

3.int array[]={val1,val2,val3,val4,val5};

(Or)

int array[]=new int[]{val1,val2,val3};

Examples:

1.int age[]=new int[3];

2.int[] marks=new int[4];

3.int score[];

score=new int[5];

**Note:**

If you are declaring array and constructing array in same line you should declare the size

Index in the array starts with 0, if the size is 3 means, the indexes is 0, 1 and 2.

Program:

package com.qsp.Arraysdemo;

public class Arrays1 {

public static void main(String[] args) {

int[] arr;

arr=new int[3];// size is declared

arr[0]=10;// initializing

arr[1]=20;

arr[2]=30;

for(int i=0;i<arr.length;i++)

{

System.out.println(arr[i]);

}

String s1[]=new String[3];

s1[0]="i";

s1[1]="love";

s1[2]="java";

for(String a:s1)// enhanced for loop

{

System.out.println(a);

}

}

}

O/P:

10

20

30

i

love

java

Note:

Arrays can be classified for our convince as primitive array and non-primitive array

Ex:

Primitive array

int arr[]=new int[5];

Non primitive array

Apple apples[]=new Apple[5];

Note:

Default values of array will be same as the default values of type declared

i.e., suppose

int arr2[]=new int[1];

System.out.println(arr2[0]);

Here, we are not initializing the array, and then it will print the default values of int which is 0

Same applies for non-primitive type

Apple a[]=new Apple[1];

System.out.println(a[0]);

Here, we are not initializing the array, and then it will print the “null” ;

Different ways of initializing the Arrays

1st way:

int[] arr=new int[3];

arr[0]=10;

arr[1]=20;

arr[2]=30;

for(int i=0;i<arr.length;i++)

{

System.out.println(arr[i]);

}

Here, we are declaring int size first and later we are taking each index and assigning the values.

2nd way

int arr2[];

arr2=new int[3];

int val=10;

for(int j=0;j<arr2.length;j++)

{

System.out.println(arr2[j]=val);

val+=10;

}

Here, we are declaring the size first and later using For Loop we are assigning values to each index.

3rd way

int[] arr3={10,20,30};

for(int a:arr3)

{

System.out.println(a);

}

Here, when we are declaring the array, then and there we are assigning the values,printing the values using enchaned ForLoop

int i[]=new int[5];

Array variable Array Object

int i1[]=new int[0];

we are declaring with size 0, so we cannot able to assign any value;

Note:

when we are trying to access elements where index is not there it will give

Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 4

at com.qsp.Arraysdemo.Arrays1.main(Arrays1.java:41)

Ex:

int b[]={};

System.out.println(b[0]);

int a[]={10,20,30};

System.out.println(a[4]);

Program:

package com.qsp.Arraysdemo;

public class Arrays2 {

public static void main(String[] args) {

int[] arr={};

char[] CArr={};

double[] darr={};

String[] Sarr={};

System.out.println(arr);

System.out.println(CArr);

System.out.println(darr);

System.out.println(Sarr);

}

}

O/P:

[I@2a139a55

[D@15db9742

[Ljava.lang.String;@6d06d69c

Note:

When you declare a Array and when print only arrayname variable , then It will print the address of the variable, its similar to

Orange o1=new Orange();

System.out.println(o1);

It will print the address, similarly the above array variable will also print address, Except, “char”.

Arrays don’t override the toString(); so you see the result of the default Object.toString implementation

int[] arr={};

system.out.println(arr);

it will print address

Program:

package com.qsp.Arraysdemo;

class Apple{

}

public class Arrays3 {

public static void main(String[] args) {

int arr[]=new int[3];

arr[0]=10;

for(int a:arr)

System.out.println(a);

String s1[]=new String[3];

s1[0]="java";

for(String a:s1)

System.out.println(a);

Apple arr2[]=new Apple[3];

Apple a1=new Apple();

arr2[0]=new Apple();

arr2[1]=a1;

for(Apple a:arr2)

System.out.println(a);

}

}O/p:

10

0

0

java

null

null

com.qsp.Arraysdemo.Apple@2a139a55

com.qsp.Arraysdemo.Apple@15db9742

null

Note: for those indexes which we does not assigned a value, complier will assign default values.

Program:

Write a program to take the char and print its numeric value

package com.qsp.Arraysdemo;

public class Arrays4{

public static void main(String[] args) {

int arr1[]={10,20,30,40,'a','V','B','t'};

for(int i:arr1)

{

if(i>=65 && i<=90 || i>=97 && i<=122)

System.out.println("i= "+(char)i+" its numeric value "+ i);

}

}

}

O/P:

i= a its numeric value 97

i= V its numeric value 86

i= B its numeric value 66

i= t its numeric value 116

Program:

Write a program to sort the array elements

package com.qsp.Arraysdemo;

import java.util.Arrays;

public class Arrays5 {

public static void main(String[] args) {

int a[]={10,3,47,58,9,1};

System.out.println("array elements before sorting");

for(int i:a)

System.out.println(i);

System.out.println(Arrays.toString(a));

System.out.println("arrays elements after sorting");

Arrays.sort(a);

for(int x:a)

System.out.println(x);

}

}

O/P:

array elements before sorting

10

3

47

58

9

1

[10, 3, 47, 58, 9, 1]

arrays elements after sorting

1

3

9

10

47

58

Note:

Arrays.sort(type) is the method , using which we can sort the array.

**TWO DIMENSIONAL ARRAY:**

We can Assign values directly

int arr[][]={{10,50,60},{40,50,60},{50,70,80}}

OR

int arr[][]=new int[] []{{10,20,30},{40,50,60},{70,80,90}}

**JAGGED ARRAY**

In jagged array columns will vary in each row

Ex:

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | 5 | 7 | 8 |
| 4 | 5 | 7 |
| 7 | 5 |

Ex:

package com.qsp.Arraysdemo;

public class TwoArrays6 {

public static void main(String[] args) {

// TODO Auto-generated method stub

int [][] arr={{3,5,7,8},{4,8,},{5,7,8,9},{6}};

for(int i=0;i<arr.length;i++)

{

for(int j=0;j<arr[i].length;j++)

{

System.out.print(arr[i][j]+" ");

}

System.out.println();

}

System.out.println("-enhanced loop--");

for(int a[]:arr)

{

for(int i:a)

{

System.out.print(i);

}

System.out.println();

}

}

}

O/P

3 5 7 8

4 8

5 7 8 9

6

-enhanced loop--

3578

48

5789

6