**Java Arrays:**

An array is a collection of similar type of elements.

Java array is an object which contains elements of a similar data type. It is a data structure where we store similar elements. We can store only a fixed set of elements in a Java array.

**Advantages:**

Code Optimization

Random Access

**Disadvantages:**

Only fixed size of elements can be stored in an array.

**Types of Array:**

Single Dimensional

Multi-Dimensional

**Declaring Single Dimensional Array:**

datatype[] arr;

datatype []arr;

datatype arr[];

**How to instantiate an array:**

ArrayRefVar = new datatype[size];

Example:

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **void** main(String[] args) {

**int** testarray[] = **new** **int**[5];

testarray[0] = 1;

testarray[1] = 2;

testarray[2] = 3;

testarray[3] = 4;

testarray[4] = 5;

System.***out***.println(testarray[0]);

System.***out***.println(testarray[1]);

System.***out***.println(testarray[2]);

System.***out***.println(testarray[3]);

System.***out***.println(testarray[4]);

}

}

Array length can be found with .length

Ex: testarray.length

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **void** main(String[] args) {

**int** testarray[] = **new** **int**[5];

testarray[0] = 1;

testarray[1] = 2;

testarray[2] = 3;

testarray[3] = 4;

testarray[4] = 5;

System.***out***.println("Array length is "+testarray.length);

**for**(**int** i=0; i<testarray.length; i++) {

System.***out***.println(testarray[i]);

}

}

}

We can declare, instantiate and initialize an array as following.

int a[] = {1,2,3,4,5}

Example:

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **void** main(String[] args) {

**int** testarray[] = {1,2,3,4,5};

System.***out***.println("Array length is "+testarray.length);

**for**(**int** i=0; i<testarray.length; i++) {

System.***out***.println(testarray[i]);

}

}

}

**Passing an Array to a Method:**

**Finding the Max. Value in an Array:**

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **int** findMax(**int** arr[]) {

**int** max = arr[0];

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

**if**(max < arr[i]) {

max = arr[i];

}

}

**return** max;

}

**public** **static** **void** main(String[] args) {

**int** testarray[] = {5,33,65,43,67,34};

**int** maxvalue = *findMax*(testarray);

System.***out***.println("Max. Value is "+maxvalue);

}

}

**Returning an array from a method:**

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **int**[] returnArray() {

**int**[] arr = {1,2,3,4,5};

**return** arr;

}

**public** **static** **void** main(String[] args) {

**int** arr[] = *returnArray*();

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

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

}

}

}

**ArrayIndexOutOfBoundsException:**

When you try to access an element, which is not in the index of the array then you an ArrayIndexOutOfBoundsException.

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **void** main(String[] args) {

**int**[] arr = {1,2,3,4,5};

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

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

}

}

}

This gives “ArrayIndexOutOfBoundsException”.

**Multidimensional Array:**

Syntax:

* dataType[][] arrayRefVar;
* dataType [][]arrayRefVar;
* dataType arrayRefVar[][];
* dataType []arrayRefVar[];

Instantiating a Multidimensional Array:

int[][] testarray = new int[2][2];

Initializing Multidimensional Array:

testarray[0][0] = 1;

testarray[0][1] = 2;

testarray[1][0] = 3;

testarray[1][1] = 4;

You can define, instantiate and initialize a multidimensional array the following way.

Int[][] testarray = {{1,2},{3,4}};

Example:

**package** FPPackage;

**public** **class** ArraysDemo {

**public** **static** **void** main(String[] args) {

**int**[][] arr = {{1,2,3},{4,5,6},{7,8,9}};

**for**(**int** i=0; i<3; i++) {

**for**(**int** j=0; j<3; j++) {

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

}

}

}

}