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Structure – Array

NYA SINGH | FILED UNDER: DS TUTORIAL

is a collection of homogeneous (same type) data items stored in contiguous memory s. For example if an array is of type "int", it can only store integer elements and cannot e elements of other types such as double, float, char etc.

Memory representation

owing diagram represents an integer array that has 12 elements. **The index of the array ith 0**, so the array having 12 elements has indexes from 0 to 11.

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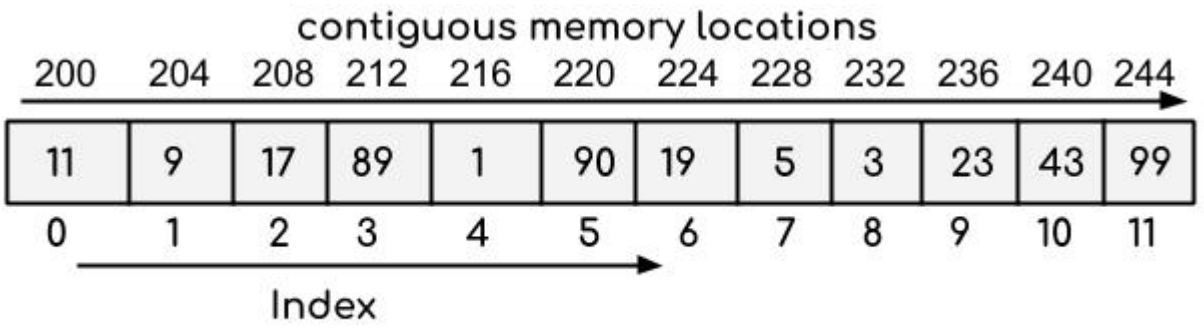
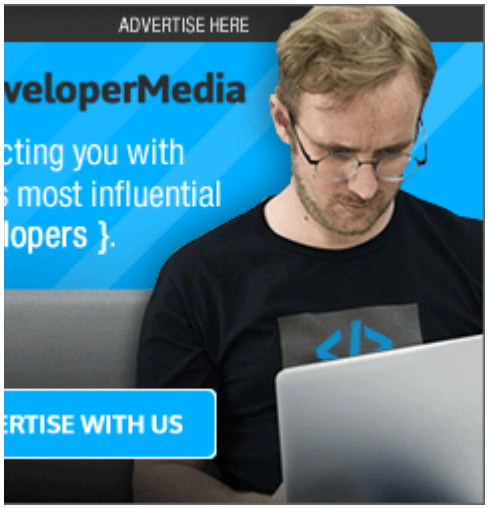


we need an array?

particularly useful when we are dealing with lot of variables of the same type. For example, I need to store the marks in math subject of 100 students. To solve this particular problem, have to create the 100 variables of int type or create an array of int type with the size 100.

ly the second option is best, because keeping track of all the 100 different variables is a task. On the other hand, dealing with array is simple and easy, all 100 values can be stored me array at different indexes (0 to 99).



sing Array elements

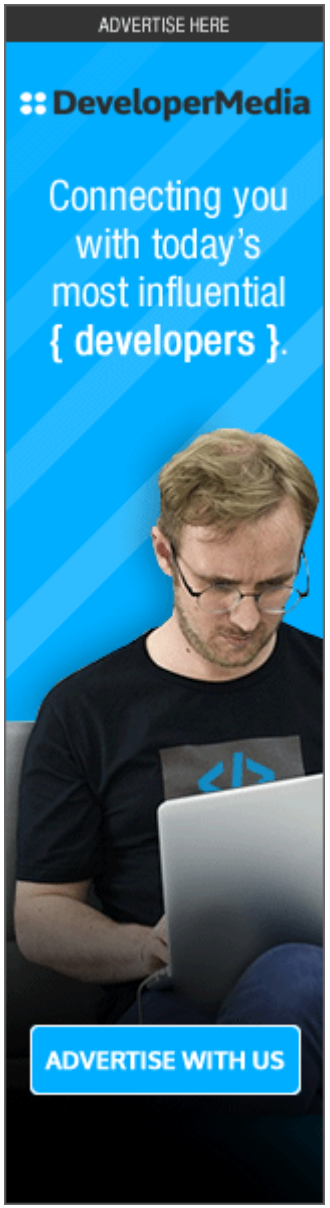
xample we have an array arr of type "int". The size of the array is 10 which means it can integer values. arr[0] would be first element, arr[1] second and so on. Here we are assigning only few elements of the array. After this program, I have shared the output of this , which shows that the **default value of the elements of an int array is 0**. The elements that assigned any value shows their value as 0 (**default value**).

```
lass JavaExample{
c static void main(String args[]) {
//array declaration
int arr[];

//allocating memory to array
arr = new int[10];

//Assigning elements
arr[1] = 100;
arr[5] = 98;
arr[3] = 11;
```

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



JavaExample.java

```
1  package com.beginnersbook;
2  public class JavaExample{
3      public static void main(String args[]) {
4          //array declaration
5          int arr[];
6
7          //allocating memory to array
8          arr = new int[10];
9
10         //Assigning elements
11         arr[1] = 100;
12         arr[5] = 98;
13         arr[3] = 11;
14
15         //Accessing array elements
16         for(int i=0; i<10 ; i++) {
17             System.out.println(arr[i]);
18         }
19     }
20 }
```

Problems @ Javadoc Declaration Console

erminated> JavaExample [Java Application] /Library/Java/JavaVir

0

complexity of Array

e a look at the **time complexity** of various operations on arrays.

on	Average Case	Worst Case
	O(1)	O(1)
	O(n)	O(n)
	O(n)	O(n)
	O(n)	O(n)

ntages and disadvantages of Arrays

tages

ng an array element is simple and efficient. As shown in the above table, the read time of O(1) in both best and worst cases. This is because any element can be instantly read using (base address calculation behind the scene) without traversing the whole array.

is a foundation of other data structures. For example other data structures such as ist, Stack, Queue etc. are implemented using array.

e elements of an array can be accessed using a single name (array name) along with the hich is readable, user-friendly and efficient rather than storing those elements in different-2 s.

antages

using array, we must need to make the decision of the size of the array in the beginning, so not aware how many elements we are going to store in array, it would make the task

ze of the array is fixed so if at later point, if we need to store more elements in it then it done. On the other hand, if we store less number of elements than the declared size, the ng allocated memory is wasted.

ray

is known as array of arrays and are used to represent matrix of elements. To read more em refer: **2D Array**

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