

Array

array declaration

- elements of array have default values. 0 for numeric types, false for boolean, '000', null for reference types
- once an array is created, its size is fixed
- array elements are accessed using an index
- array index starts at 0
- array index can be any integer type
- array index can be any expression that evaluates to an integer

Exercises:

1. what would be the output of following program?

```
public class ArrayTest {  
    public static void main(String[] args) {  
        int[] arr = new int[5];  
        System.out.println(arr[3]);  
    }  
}
```

- a) 0
 - b) 3
 - c) null
 - d) error
-

2. what would be the output of following program?

```
public class ArrayTest {  
    public static void main(String[] args) {  
        int[] arr = new int[5];  
        System.out.println(arr[5]);  
    }  
}
```

- a) 0
 - b) 5
 - c) runtime error
 - d) compile time error
-

3. what would be the output of following program?

```
public class ArrayTest {  
    public static void main(String[] args) {
```

```

        int[] arr = new int[5];
        System.out.println(arr[-1]);
    }
}

```

- a) 0
 - b) -1
 - c) runtime error
 - d) compile time error
-

array initialization

- array elements can be initialized at the time of declaration
- array elements can be initialized using an array initializer
- array initializer is a comma separated list of expressions enclosed in curly braces
- array initializer can be used to initialize all or some of the elements of an array
- array initializer can be used to initialize multidimensional arrays

Exercises:

4. what would be the output of following program?

```

public class ArrayTest {
    public static void main(String[] args) {
        int[] arr = {1, 2, 3, 4, 5};
        System.out.println(arr[3]);
    }
}

```

- a) 0
 - b) 3
 - c) 4
 - d) error
-

5. what would be the output of following program?

```

public class ArrayTest {
    public static void main(String[] args) {
        int[] arr = {1, 2, 3, 4, 5};
        System.out.println(arr[5]);
    }
}

```

- a) 0
 - b) 5
 - c) runtime error
 - d) compile time error
-

6. how can i initialize an array of size 5 with values 1, 2, 3, 4, 5?

a) `int[] arr = {1, 2, 3, 4, 5};`

- b) `int[] arr = new int[5] {1, 2, 3, 4, 5};`
 - c) `int[] arr = new int[] {1, 2, 3, 4, 5};`
 - d) `int[] arr = new int[5] = {1, 2, 3, 4, 5};`
-

array access

- array elements are accessed using an index
- array index starts at 0
- array index can be any integer type
- array index can be any expression that evaluates to an integer

Exercises:

7. what would be the output of following program?

```
public static void main(String[] args) {  
    int[] arr = new int[10];  
    arr[4] = 5;  
    int[] arr2 = arr;  
    arr2[4] = 3;  
    System.out.println(arr[4]);  
}
```

- a) 3
 - b) 5
 - c) 10
 - d) Compiler Error
-

array length

- array length is the number of elements in the array
- array length is accessed using the length property
- array length is an integer
- array length is read-only

Exercises:

8. what would be the output of following program?

```
public static void main(String[] args) {  
    int[] arr = new int[10];  
    System.out.println(arr.length);  
}
```

- a) 10
- b) 0
- c) 1
- d) Compiler Error

9. what would be the output of following program?

```
public static void main(String[] args){  
    int[] arr = new int[10];  
    arr.length = 5;  
    System.out.println(arr.length);  
}
```

- a) 10
- b) 5
- c) runtime error
- d) Compiler time Error

10. what would be the output of following program?

```
public static void main(String[] args){  
    int[] arr = new int[] {0, 1, 2, 3, 4};  
    System.out.println(arr.length);  
}
```

- a) 4
 - b) 5
 - c) 1
 - d) Compiler Error
-

array iteration

- array elements can be accessed using a for loop
- array elements can be accessed using a foreach loop

Exercises:

11. the following program prints the elements of an array. what should be in the blank?

```
public static void main(String[] args){  
    int[] arr = new int[] {1, 2, 3, 4, 5};  
    for(int i = 0; i < _____; i++){  
        System.out.print(arr[i] + " ");  
    }  
}
```

- a) len(arr)
 - b) arr.length
 - c) arr.length()
 - d) arr.length(i)
-

12. what would be the output of following program?

```
public static void main(String[] args){
    int[] arr = new int[] {1, 2, 3, 4, 5};
    for(int i : arr){
        System.out.print(i + " ");
    }
}
```

- a) 1 2 3 4 5
 - b) 0 1 2 3 4
 - c) 0 1 2 3 4 5
 - d) Compiler Error
-

array elements usage

- array elements can be used in any operation that uses a variable of the same type

Exercises:

13. The following function is supposed to reverse the elements of an integer array. What should be replaced with question marks?

```
static void reverse(int[] arr) {
    int temp;
    int len = arr.length;
    for(int i=0; i< len/2 ; i++) {
        temp = arr[i];
        arr[i] = _____;
        _____ = temp;
    }
}
```

- a) arr[arr.length - i - 1]
 - b) arr[len - 1 - i]
 - c) tmp____arr[i]
 - d) arr[len/2]
-

Lab Questions

1. Write a program to print the sum of all the elements of an array of size 5.
2. write a function that takes an array of integers and sorts it in ascending order.(return an array)
3. write a function that takes an array of integers and sorts it in descending order.(return an array)
4. write a function which rotate an integer array by given amount. As demonstrated:
[1, 2, 3, 4, 5, 6] -> rotate by +1 -> [6, 1, 2, 3, 4, 5]
[1, 2, 3, 4, 5, 6] -> rotate by +3 -> [4, 5, 6, 1, 2, 3]

[1, 2, 3, 4, 5, 6] -> rotate by -2 -> [3, 4, 5, 6, 1, 2]

5. write a program that take a set of integers from user and print them in reverse order
6. write a function that take two sorted array of integers and returns a merged sorted array. (in same order of two initial array)

answers to exercises

1. a
2. c
3. c
4. c
5. d
6. a,c
7. a
8. a
9. d
10. b
11. b
12. a
13. a,b

answer to Lab Questions