Arrays in Java

Bca 4th semester
Ashmita Mahanty
Assistant professor
Departement of IT

Arrays in Java

- It is a referenced data type.
- It is used to store multiple values.
- In array size is fixed (we can't change size in runtime).
- Array support homogenous type elements.
- Definition- Array is a container which is used to store collection of elements with same type.

Syntax-

Array Declaration

Data type[] variable name;

Int[] arr;

Array creation

Variable Name=new datatype[size]

Arr=new int[5];

Datatype[] variable Name=new Datatype[size];

Eg- Int[] arr=new int[5];

Note- At the time of creating array we have to specify the size of an array it is mandatory.

Array size specifies how many elements we can specify in array.

Int[] arr=new int[5];

0 1 2 3 4

- Array will store the element based on indexes.
- Array index will always start from '0'

Int[] arr=new int[5];

0	1	2	3	4
101	102	103	104	105

arr[0]=101;
arr[1]=102;
arr[2]=103;
arr[3]=104;
arr[4]=105;

```
public class ArrayDemo {
    public static void main(String[] args)
    {
            int[] arr=new int[5];
            arr[0]=101;
            arr[1]=102;
            arr[2]=103;
            arr[3]=104;
            arr[4]=105;
            System.out.println(arr[0]);
    }
}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
101
```

```
public class ArrayDemo1{
    public static void main(String[] args)
    {
            int[] arr=new int[5];
            arr[0]=101;
            arr[1]=102;
            arr[2]=103;
            arr[3]=104;
            arr[4]=105;
            for(int i=0;i<5;i++)
            {
                System.out.println(arr[i]);
            }
    }
}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
101
102
103
104
105
```

```java
public class ArrayDemo {
    public static void main(String[] args)
    {
            int[] arr=new int[5];
            arr[0]=101;
            arr[1]=102;
            arr[2]=103;
            arr[3]=104;
            arr[4]=105;
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }
    }
}
```

```
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
101
102
103
104
105
```

Length- we can find size of the array by using length property.

```java
public class ArrayDemo {
    public static void main(String[] args)
    {
            int[] arr=new int[3];
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }
    }
}
```

```
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
0
0
0
```

Default value of integer data type is ‘0’

```
public class ArrayDemo {
    public static void main(String[] args)
    {
            boolean[] arr=new boolean[3];
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }
    }
}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
false
false
false

Default value of boolean data type is ‘false’
```

```
public class ArrayDemo {
    public static void main(String[] args)
    {
            double[] arr=new double[3];
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }
    }
}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
0.0
0.0
0.0

Default value of doubler data type is ‘0.0’
```

We can create array in two ways-

1. Int arr[]=new int[3];
2. Int arr[]={101,102,103}; // here it will identify the size of an array according to the elements stored in it .

```
public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]={101,102,103};
            arr[0]=100; // it will update 0th index value 101 to 100
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }
    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
100
102
103
```

Program to take user input

→in this program we are using for loop to print elements of an array.

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }
            System.out.println("elements of an array are");
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }
    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
2
```

```
3
4
5
elements of an array are
1
2
3
4
5
```

→in this program we are using for each loop to print elements of an array.

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }
            System.out.println("elements of an array are");
            for(int n:arr)
            {
                System.out.print(n + " ");
            }
    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
2
3
4
1
elements of an array are
1 2 3 4 1
```

=

Note-

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

→it will not give error at compile time but at the time of execution it will give exception 'NegativeArraySizeException'

So, array size should be positive integer only.

int arr[]=new int[8.9]; // array size type is double

→decimal value can't be used for Array size.

Write a java program to find minimum and maximum element of an array.

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[10];
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }
            int min=arr[0];
            int max=arr[0];
            for(int i=0;i<arr.length;i++)
            {
                if(arr[i]<min)
                {
                    min=arr[i];
                }
                if(arr[i]>max)
                {
                    max=arr[i];
                }
            }
            System.out.println("minimum element of an array is="+ min);
            System.out.println("maximum element of an array is="+ max);

    }

}
```

```
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
3
5

0
64
36
3
7
8
3
minimum element of an array is=0
maximum element of an array is=64
```

Write a java program to reverse elements of an array?

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }
            System.out.println("Reverse element of array");
            for(int i=arr.length-1;i>=0;i--)
            {
                System.out.println(arr[i]);
            }


    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
```

```
2
3
4
5
Reverse element of array
5
4
3
2
1
```

Write a java program to reverse an array

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            int temp;
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }

            for(int i=0;i<arr.length/2;i++)
            {
                temp=arr[i];
                arr[i]=arr[arr.length-i-1];
                arr[arr.length-i-1]=temp;
            }
            System.out.println("Reverse element of array");
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }


    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
```

```
2
3
4
5
Reverse element of array
5
4
3
2
1
```

Write a java program to sort elements of an array in ascending order

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            int temp;
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }

            for(int i=0;i<arr.length;i++)
            {
                for(int j=i+1;j<arr.length;j++)
                {
                    if(arr[i]>arr[j])
                    {
                        temp=arr[i];
                        arr[i]=arr[j];
                        arr[j]=temp;

                    }

                }

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

```
    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
5
3
6
8
2
Sorted array
2
3
5
6
8
```

Write a java program to sort elements of an array in descending order.

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            int temp;
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }

            for(int i=0;i<arr.length;i++)
            {
                for(int j=i+1;j<arr.length;j++)
                {
                    if(arr[i]<arr[j])
                    {
                        temp=arr[i];
                        arr[i]=arr[j];
                        arr[j]=temp;

                    }
```

```
                }

            }
            System.out.println("Sorted array");
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }


    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
4
6
73
6
Sorted array
73
6
6
4
1
```

Write a java program to segregate 1's and 0's

i/p- {1,1,0,1,0,1} o/p- {0,0,1,1,1}

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
            int temp;
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {
                Scanner sc=new Scanner(System.in);
                arr[i]=sc.nextInt();
            }

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

```
            {
                for(int j=i+1;j<arr.length;j++)
                {
                    if(arr[i]>arr[j])
                    {
                        temp=arr[i];
                        arr[i]=arr[j];
                        arr[j]=temp;

                    }

                }

            }
            System.out.println("Sorted array");
            for(int i=0;i<arr.length;i++)
            {
                System.out.println(arr[i]);
            }


    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
1
0
1
0
Sorted array
0
0
1
1
1
```

Write a java program to search element in an array.

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[5];
```

```
            int temp;
            Scanner sc=new Scanner(System.in);
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {

                arr[i]=sc.nextInt();
            }
            System.out.println("enter elements which you want to search");
            int item=sc.nextInt();
            for(int i=0;i<arr.length;i++)
            {
                if(arr[i]==item)
                {
                    System.out.println("element found at this index="+ i);
                    break;
                }
                i=i+1;

            }
    }

}
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
1
2
3
4
5
enter elements which you want to search
3
element found at this index=2
```

write a java program to find array element pairs whose sum is equal to given number.

i/p- {3,5,1,6,2,7,8} i/p no- 8

o/p-

3,5=8

1,7=8

6,2=8

```java
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[]=new int[10];
            int temp;
            Scanner sc=new Scanner(System.in);
            System.out.println("enter elements of an array");
            for(int i=0;i<arr.length;i++)
            {

                arr[i]=sc.nextInt();
            }
            for(int i=0;i<arr.length;i++)
            {
                for(int j=i+1;j<arr.length;j++)
                {
                    if(arr[i]+arr[j]==8)
                    {
                        System.out.println(arr[i]+","+arr[j]);
                    }
                }
            }
    }

}
```

```
C:\Users\user\Desktop\My_java>javac ArrayDemo.java

C:\Users\user\Desktop\My_java>java ArrayDemo
enter elements of an array
3
5
1
6
2
7
9
0
1
4
3,5
1,7
6,2
7,1
```

Write a java program to find non-repeated array elements

i/p- {2,3,2,1,3,4,5};

o/p- 1,4,5

Arrays are divided into 2 types-

1. Single dimensional array
   Int arr[]=new int[5]
2. Multi Dimensional array
   Int arr[] []=new int [row size] [col size];

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[][]=new int[2][2];
            arr[0][0]=100;
            arr[0][1]=200;
            arr[1][0]=300;
            arr[1][1]=400;
            System.out.println("length of an array"+arr.length);//it will give
length of row only
            System.out.println("array element at
position=arr[1][0]"+arr[1][0]);
            for(int i=0;i<arr.length;i++)
            {
                System.out.println("single loop for printing ="+arr[i]); // it
will object representation of 1st and 2nd row
            }
            for(int i=0;i<arr.length;i++)
            {
                for(int j=0;i<arr.length;j++)
                {
                    System.out.println("nested loop for printing
="+arr[i][j]);
                }
            }

    }

}
```

```
length of an array2
array element at position=arr[1][0]300
single loop for printing =[I@63961c42
single loop for printing =[I@65b54208
nested loop for printing =100
nested loop for printing =200
```

printing elements using for each loop

```
import java.util.Scanner;

public class ArrayDemo {
    public static void main(String[] args)
    {
            int arr[][]=new int[2][2];
            arr[0][0]=100;
            arr[0][1]=200;
            arr[1][0]=300;
            arr[1][1]=400;
            System.out.println("for each loop");//it will give length of row
only

            for(int a[]:arr)
            {
                for(int n:a)
                {
                    System.out.println(n);
                }
            }

    }

}
for each loop
100
200
300
400
```