

DATA STRUCTURES & ALGORITHMS

#03

Array ADT

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| Work submitted on: MS Teams |

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| --- | --- | --- | --- |
| **Maximum Marks** | **Performance** | **Viva** | **Total** |
| **Marks Obtained** |  |  |  |
| **Remarks (if any)** |  | | |
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| **Experiment evaluated by** | | | |
| Instructor Name: | | | |
| Signature: | | | |

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| Array Related Tasks |

Arrays in Java are like a list of elements of the same type i.e. a list of integers, a list of booleans etc.

1. Creating an Array (method 1) - with new keyword

int[] marks = new int[3];

marks[0] = 97;

marks[1] = 98;

marks[2] = 95;

1. Creating an Array (method 2)

**int[] marks = {98, 97, 95};**

1. Taking an array as an input and printing its elements.

import java.util.\*;

public class Arrays {

   public static void main(String args[]) {

       Scanner sc = new Scanner(System.in);

       int size = sc.nextInt();

       int numbers[] = new int[size];

       for(int i=0; i<size; i++) {

           numbers[i] = sc.nextInt();

       }

       //print the numbers in array

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

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

       }

   }

}

**Task 1**

Take an array of names as input from the user and print them on the screen.

import java.util.Scanner;

public class Array\_Input

{

    public static void main(String args[])

    {

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter number in the following ");

        String name\_arr[] = new String[5];

        for(int i=0; i<name\_arr.length; ++i)

        {

            name\_arr[i] = obj.nextLine();

        }

        System.out.println("The name you enter are: ");

        for(int i=0; i< name\_arr.length; ++i)

        {

            System.out.println(name\_arr[i]);

        }

        obj.close();

    }

}

**Task 2:**

Find the maximum & minimum number in an array of integers.

import java.util.Scanner;

public class Max\_Min\_Num

{

    public static void main(String args[])

    {

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter random four numbers: ");

        int num[] = new int[4];

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

        {

            num[i] = obj.nextInt();

        }

        int max\_num = num[0];

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

        {

            if(max\_num<num[i])

            {

                max\_num = num[i];

            }

        }

        System.out.println("Maximum number is: "+ max\_num);

        int min\_num = num[0];

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

        {

            if(min\_num>num[i])

            {

                min\_num = num[i];

            }

        }

        System.out.println("Minimum number is: "+ min\_num);

        obj.close();

    }

}

**Task 3:**

Take an array of numbers as input and check if it is an array sorted in ascending order.

Eg : { 1, 2, 4, 7 } is sorted in ascending order.

{3, 4, 6, 2} is not sorted in ascending order

import java.util.Scanner;

public class sort\_ascending

{

    public static void main(String[] args) {

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter the size of the array: ");

        int size = obj.nextInt();

        System.out.printf("Input %d numbers: ",size);

        System.out.println();

        int[] arr = new int[size];

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

        {

            arr[i]=obj.nextInt();

        }

        int prev = arr[0];

        boolean flag = true;

        for(int i = 1; i<arr.length; ++i)

        {

            if(arr[i]<prev) //If next value is short means that array is not in ascending order

            {

                flag = false;

                break;

            }

            prev = arr[i];

        }

        if(flag == true)

        {

            System.out.println("The array is in ascending order.");

        }

        else if(flag == false)

        {

            System.out.println("The array is not in ascending order.");

        }

        obj.close();

    }

}

**Task 4:**

Print the values 8, 3, 87, and 34 by accessing them from the given two-dimensional array.

**public class Test1**

**{**

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

**{**

**int[][] arr = { {10,39,8},3,{35,87},22,{34} };**

**// ADD CODE HERE //**

**}**

**}**

import java.util.Scanner;

public class two\_d\_arr

{

    public static void main(String args[])

    {

        Scanner obj = new Scanner(System.in);

        System.out.println("Following are the numbers to print");

        int arr[][] = { {10,39,8},{35,87},{3,22},{34,11} };

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

        {

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

            {

                if(arr[i][j] == 8 || arr[i][j] == 3 || arr[i][j] == 87 ||  arr[i][j] == 34 )

                {

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

                }

            }

        }

        /\*System.out.println("The name you enter are: ");

        for(int i=0; i< name\_arr.length; ++i)

        {

            System.out.println(name\_arr[i]);

        }\*/

        obj.close();

    }

}

**Task 5:**

Print the number of rows in the given two-dimensional array, or the length of the outer array. Then print the number of columns, or the length of each inner array.

**Ex.** The array { {“hello”,”there”,”world”},{“how”,”are”,”you”} } should print:

Rows: 2

Columns: 3

public class Test1 {

public static void main(String[] args)

{

String[][] arr = { {"hello","there","world"},

{"how","are","you"} };

System.out.println("Rows:");

// ADD CODE TO PRINT NUMBER OF ROWS HERE //

System.out.println("Columns:");

// ADD CODE TO PRINT NUMBER OF COLUMNS HERE //

}

}

import java.util.Scanner;

public class Print\_row\_col

{

    public static void main(String args[])

    {

        Scanner obj = new Scanner(System.in);

        System.out.println("Following are the numbers to print");

        int row = 0;

        int col = 0;

        String arr[][] = { {"hello","there","world"}, {"how","are","you"}};

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

        {

            col = 0;

            System.out.printf("Row %d: ",i);

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

            {

                col++;

               if(j == arr[i].length - 1)

                {

                    System.out.println(col + "Columns");

                }

            }

            row++;

        }

        System.out.println("Rows: " + row);

        //System.out.println("Columns: " + col);

        obj.close();

    }

}