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Experiment No.	4

AIM:	**Program on 1D Arrays,2D Arrays and Object Arrays in Java.**
Program 1	
PROBLEM STATEMENT:	**Write a program called GradesStatistics, which reads in n grades (of int between 0 and 100, inclusive) and displays the average, minimum, maximum, median and standard deviation. Display the floating-point values upto 2 decimal places. Your output shall look like:** **Enter the number of students : 4** **Enter the grade for students 1 : 50** **Enter the grade for students 2 : 51** **Enter the grade for students 3 : 56** **Enter the grade for students 4 : 53** **{50,51,56,53}** **The average is 52.50** **The Minimum is 50** **The Maximum is 56** **The Median is : 52.00** **Note: 1) The std. deviation is 2.29(formula can be referred from net)**

PROGRAM:	import java.util.*;
	import java.lang.Math;
	class gradesStatistics{
	double med,std=0;
	double avg,min,max;
	int temp;
	void input(){
	Scanner scan= new Scanner(System.in);
	System.out.print("No. of students: ");
	int n=scan.nextInt();
	int sum=0;
	double grade[]= new double[n];
	for(int i=0;i<n;i++){

```
            System.out.printf("Enter the grades of student %d: ",i+1);
            grade[i]=scan.nextDouble();
        }
        display(n,grade);
    }
    void display(int n, double [] grade){
        Arrays.sort(grade);
        for(int i=0;i<n;i++){
        avg+= grade[i];
       }
        avg=avg/n;

        for(int i=0;i<n;i++){
            std+=(grade[i]-avg)*(grade[i]-avg);
        }
        std=std/n;
        std=Math.sqrt(std);
        min=grade[0];
        max=grade[n-1];

        if(med%2!=0){
            med=grade[(n+1)/2];
        }
        else{
            med=(grade[n/2]+grade[(n/2)+1])/2;
        }
    System.out.printf("Average = %.2f\n", avg);
    System.out.printf("The Minimum no.= %.0f\n",grade[0]);
    System.out.printf("The Maximum no. =  %.0f\n",grade[n-1]);
    System.out.printf("The Median = %.2f\n" ,med);
    System.out.printf("Standard Deviation = %.2f\n",std);
    }
    public static void main(String[] args){
         Scanner scan= new Scanner(System.in);
        gradesStatistics ob= new gradesStatistics();
        ob.input();
    }
}
```

RESULT:

```
No. of students: 4
Enter the grades of student 1: 50
Enter the grades of student 2: 51
Enter the grades of student 3: 56
Enter the grades of student 4: 53
Average = 52.50
The Minimum no.= 50
The Maximum no. =  56
The Median = 54.50
Standard Deviation = 2.29
```

Program 2

PROBLEM STATEMENT:	**Book Ratings : Write a program to find the most popular book. Create a 2D array named bookRating which should hold ratings(1 to 5) of a few books. You may consider the first constant reader's rating (or Scan and next time as - how many readers have given the rating ?) Collect ratings of four such books. a)Find the average rating of each book. b) Display the most popular book. ie a Book with highest average rating.**
PROGRAM:	

```
import java.util.*;

class rating {
    Scanner sc = new Scanner(System.in);

    void input() {
        System.out.print("Enter the number of readers: ");
        int n = sc.nextInt();
        double[][] books = new double[4][n];
        for (int i = 0; i < 4; i++) {
            System.out.printf("Enter %d ratings for book %d: ", n, i + 1);
            for (int j = 0; j < n; j++) {
                books[i][j] = sc.nextDouble();
            }
        }
        average(n, books);
    }

    void average(int n, double[][] book) {
        double[] avg = new double[4];
        double popular = 0;
        int c = 0;
        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < n; j++) {
                avg[i] += book[i][j];
            }
```

```
            avg[i] = avg[i] / n;
            if (avg[i] > popular) {
                popular = avg[i];
                c = i+1;
            }
            System.out.printf("Book %d Rating: %.2f \n", i + 1, avg[i]);
        }
        System.out.printf("\nThe Most popular Book:\nBook %d with Rating: %.2f ", c,
popular);
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        rating book = new rating();
        book.input();

    }
}
```

RESULT:

```
Enter the number of readers: 2
Enter 2 ratings for book 1: 3.2 4
Enter 2 ratings for book 2: 2.3 4.6
Enter 2 ratings for book 3: 3.2 3.8
Enter 2 ratings for book 4: 3.2 4.1
Book 1 Rating: 3.60
Book 2 Rating: 3.45
Book 3 Rating: 3.50
Book 4 Rating: 3.65

The Most popular Book:
Book 4 with Rating: 3.65
```

Program 3

PROBLEM STATEMENT:

Write a program in Java to maintain the information of Movies which includes the information of name of movie , type of movie(action , thriller , comedy ,drama) , Hero name , Heroine , budget in Rs. .
a) To accept the information of movies from user and sort them according to the budget of the film.

b) To print all movies whose name start with S/A

c) Print all movie with name largest in all movies

PROGRAM:

```
import java.util.*;
```

```
public class movie {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number of movies: ");
        int n = sc.nextInt();
        sc.nextLine();
        String[] movie = new String[n];
        String[] type = new String[n];
        String[] hero = new String[n];
        String[] heroine = new String[n];
        int[] budget = new int[n];
        int[] copy = new int[n];
        int[] len = new int[n];
        int i = 0, j = 0;
        for (i = 0; i < n; i++) {
            System.out.print("Enter the name of the movie: ");
            movie[i] = sc.nextLine();
            System.out.print("Enter the type of the movie: ");
            type[i] = sc.nextLine();
            System.out.print("Enter the hero of the movie: ");
            hero[i] = sc.nextLine();
            System.out.print("Enter the heroine of the movie: ");
            heroine[i] = sc.nextLine();
            System.out.print("Enter the budget of the movie: ");
            budget[i] = sc.nextInt();
            sc.nextLine();
            copy[i] = budget[i];
            len[i] = movie[i].length();
            System.out.println(" ");
        }
        Arrays.sort(copy);
        Arrays.sort(len);
        for (i = 0; i < n; i++) {
            for (j = 0; j < n; j++) {
                if (copy[i] == budget[j])

System.out.printf("Name: %s\nType: %s\nHero: %s\nHeroine: %s\nBudget: %d\n\n",
movie[j], type[j],
                        hero[j], heroine[j], budget[j]);
            }
        }
        System.out.println("Movies which start with A or S:");
        for (i = 0; i < n; i++) {
```

```
            if (movie[i].startsWith("S") || movie[i].startsWith("A"))

System.out.printf("Name: %s\nType: %s\nHero: %s\nHeroine: %s\nBudget: %d\n\n",
movie[i], type[i],
                    hero[i], heroine[i], budget[i]);
        }
        System.out.println("Movie whose name is the longest:");
        for (i = 0; i < n; i++) {
            if (len[n - 1] == movie[i].length())

System.out.printf("Name: %s\nType: %s\nHero: %s\nHeroine: %s\nBudget: %d\n\n",
movie[i], type[i],
                    hero[i], heroine[i], budget[i]);
        }
    }
}
```

RESULT:

```
Name: Annabelle
Type: Horror
Hero: Hatim
Heroine: XYZ
Budget: 69693

Name: Home Alone
Type: Comedy
Hero: Billy
Heroine: ABC
Budget: 75000

Movies which start with A or S:
Name: Annabelle
Type: Horror
Hero: Hatim
Heroine: XYZ
Budget: 69693

Movie whose name is the longest:
Name: Home Alone
Type: Comedy
Hero: Billy
Heroine: ABC
Budget: 75000
```

CONCLUSION: In this experiment, we learned how to declare a 1D array in java and also how to declare an object of an array.