AIM:	Programs on Arrays and Arrays of Objects
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.*;
	public class GradesStatistics {
	static double average(Integer[] mark){
	double sum=0;
	for(int i=0;i< mark.length;i++){
	sum+=mark[i];
	}
	return sum/ mark.length;
	}
	public static void main(String[] args) {
	Scanner sc=new Scanner(System.in);
	System.out.print("Enter the number of students : ");
	int n=sc.nextInt();
	Integer[] marks=new Integer[n];
	for(int i=1;i<=n;++i){
	System.out.print("Enter the grade for students "+ i+" :");
	marks[i-1]=sc.nextInt();
	}
	System.out.print("{");
	for(int i=1;i<=n;++i){
	System.out.print(marks[i-1]+",");
	}
	System.out.println("}");
	System.out.println("The average is "+average(marks));

```
        Arrays.sort(marks);
        System.out.println("The Minimum "+marks[0]);
        System.out.println("The Maximum "+marks[n-1]);
        if (n%2==0){
            System.out.println("The Median is : "+(double)((marks[n/2-1]+marks[n/2])/2));
        }
        else{
            System.out.println("The Median is : "+(double)marks[marks.length/2]);
        }
        double mean=average(marks);
        double std =0;
        for(int i=0;i<marks.length;i++){
            std+=Math.pow(marks[i]-mean,2);
        }
        System.out.printf("The std. deviation is %.2f",Math.sqrt(std/ marks.length));
    }
}
```

RESULT:

```
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 52.5
The Minimum 50
The Maximum 56
The Median is : 52.0
The std. deviation is 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.Scanner;
class bookrating{
   double rating,average;
   Scanner sc = new Scanner(System.in);
   String name;
   int user;
   bookrating(String name, int user){
      rating=0;
      average=0;
      this.name=name;
      this.user=user;
   }
   void setAverage(){
      double sum=0;
      for(int i=0;i<user;i++){
         System.out.print("reting darj karen: ");
         double rating=sc.nextDouble();
         sum+=rating;
      }
      average=sum/user;
   }
}
public class Rating {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter the number of books: ");
      int n=sc.nextInt();
      bookrating[] b= new bookrating[n];
      for(int i=0;i<n;i++){
         sc.nextLine();
         System.out.print("pustak ka naam darj karen:");
         String name=sc.nextLine();
         System.out.print("paathakon kee sankhya darj karen:");
         int user= sc.nextInt();
         b[i]= new bookrating(name,user);
         b[i].setAverage();
      }
      int max_index=0;
      for(int i=1;i<n;i++){
         if(b[max_index].average<b[i].average){
            max_index=i;
         }
      }
      System.out.println("The most popular book is: "+b[max_index].name);
```

```
    }
}
```

RESULT:

```
Enter the number of books: 4
pustak ka naam darj karen: Harry Potter
paathakon kee sankhya darj karen:5
reting darj karen: 2.3
reting darj karen: 3
reting darj karen: 4.2
reting darj karen: 5
reting darj karen: 3.2
pustak ka naam darj karen:Attitude is EVERYTHING
paathakon kee sankhya darj karen:5
reting darj karen: 5
reting darj karen: 5
reting darj karen: 5
reting darj karen: 5
reting darj karen: 4.3
pustak ka naam darj karen:Life's Amazing Secrets
paathakon kee sankhya darj karen:5
reting darj karen: 3.2
reting darj karen: 3.4
reting darj karen: 3
reting darj karen: 4.2
reting darj karen: 5
pustak ka naam darj karen:Everything Is Fucked
paathakon kee sankhya darj karen:5
reting darj karen: 4
reting darj karen: 3
reting darj karen: 2
reting darj karen: 1.5
reting darj karen: 5
The most popular book is: Attitude is EVERYTHING
```

Program 3	
PROBLEM STATEMENT:	Shopping Cart: Create a 3D array named as cart which stores the cost of items purchased. Each conveyor belt holds 3 carts at a time. Each cart should contain Perishable and Non-perishable category items. Find out a) Total cost of each cart b) Find out all perishable items sold (on 3 carts) c) Find out costliest non-perishable item sold

PROGRAM:	import java.util.*;
	class food_items{
	String name;
	int price;
	food_items(String name,int price){
	this.name=name;
	this.price=price;
	}
	}
	public class Shopping_cart {
	public static void main(String[] args) {
	Scanner sc = new Scanner(System.in);
	System.out.print("Enter the number of items which 3 carts have: ");
	int n = sc.nextInt();
	int[][][] carts = new int[3][2][n];
	food_items[] fd = new food_items[6];
	fd[0] = new food_items("Paneer", 20);
	fd[1] = new food_items("Aloo", 50);
	fd[2] = new food_items("Bhindi", 12);
	fd[3] = new food_items("Grains", 200);
	fd[4] = new food_items("Nut butters", 150);
	fd[5] = new food_items("Dried fruits", 75);
	int user = 2;
	while (user >= 0) {
	System.out.println("User " + (user + 1));
	System.out.println("1: Paneer\n2: Aloo\n3: Bhindi\n4: Grains\n5: Nut butters\n6: Dried fruits");
	for (int i = 0; i < n; i++) {
	int option = sc.nextInt();
	switch (option) {
	case 1:
	carts[user][0][i] = fd[option - 1].price;
	break;
	case 2:
	carts[user][0][i] = fd[option - 1].price;
	break;

```
                case 3:
                    carts[user][0][i] = fd[option - 1].price;
                    break;
                case 4:
                    carts[user][1][i] = fd[option - 1].price;
                    break;
                case 5:
                    carts[user][1][i] = fd[option - 1].price;
                    break;
                case 6:
                    carts[user][1][i] = fd[option - 1].price;
                    break;
                default:
                    System.out.println("You have a every good eyes. Keep that in refrigerator not
on your face");
                }
            }
            user--;
        }
        user=2;
        while (user >= 0) {

System.out.println("==========================================================
");
            System.out.println("User " + (user + 1));
            int total=0;
            for (int i = 0; i < 2; i++) {
                for(int j=0;j < n;j++){
                    total+=carts[user][i][j];
                }
            }
            System.out.println("The total cost is: "+total);
            user--;

System.out.println("==========================================================
");
        }
        user=2;
        while (user >= 0) {

System.out.println("==========================================================
");
            System.out.println("User " + (user + 1));
            int total=0;
```

```
            for (int i = 0; i < 2; i++) {
                for(int j=0;j < n;j++){
                    total+=carts[user][0][i];
                }
            }
            System.out.println("The total cost of all perishable items sold is: "+total);
            user--;

System.out.println("==================================================");
        }
        Arrays.sort(carts[0][0]);
        Arrays.sort(carts[1][0]);
        Arrays.sort(carts[2][0]);
        System.out.println("==================================================");
        System.out.println("The costliest non-perishable item sold of cart 1: "+carts[0][0][n-1]);
        System.out.println("The costliest non-perishable item sold of cart 2: "+carts[1][0][n-1]);
        System.out.println("The costliest non-perishable item sold of cart 3: "+carts[2][0][n-1]);
 System.out.println("==================================================");
    }
}
```

RESULT:

```
Enter the number of items which 3 carts have: 4
User 3
1: Paneer
2: Aloo
3: Bhindi
4: Grains
5: Nut butters
6: Dried fruits
1
2
3
2
User 2
1: Paneer
2: Aloo
3: Bhindi
4: Grains
5: Nut butters
6: Dried fruits
1 3 4 5
```

```
User 1
1: Paneer
2: Aloo
3: Bhindi
4: Grains
5: Nut butters
6: Dried fruits
1 3 2 1
============================================================
User 3
The total cost is: 132
============================================================
============================================================
User 2
The total cost is: 382
============================================================
============================================================
User 1
The total cost is: 102
============================================================
============================================================
User 3
The total cost of all perishable items sold is: 280
============================================================
```

```
============================================================
User 2
The total cost of all perishable items sold is: 128
============================================================
============================================================
User 1
The total cost of all perishable items sold is: 128
============================================================
============================================================
The costliest non-perishable item sold of cart 1: 50
The costliest non-perishable item sold of cart 2: 20
The costliest non-perishable item sold of cart 3: 50
============================================================
```

Program 4	
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.*;
	class movie_info{
	String movie_name,movie_Type,hero,heroine/*not the drug one*/;
	int budget;
	movie_info(String name,String type,String hero, String heroine, int budget){
	this.movie_name=name;
	this.movie_Type=type;
	this.hero=hero;
	this.heroine=heroine;
	this.budget=budget;
	}
	void display(){
	System.out.println(movie_name+" \t\t "+movie_Type+" \t\t "+hero+" \t\t "+heroine+" \t\t "+budget+" \t\t ");
	}
	}
	public class IMDB_Ratings {
	public static void main(String[] args) {
	Scanner sc=new Scanner(System.in);
	System.out.print("Enter the number of movies: ");
	int n = sc.nextInt();
	movie_info[] mo=new movie_info[n];
	for(int i=0;i<n;i++){
	sc.nextLine();
	System.out.print("philm ka naam darj karen: ");
	String name= sc.nextLine();
	System.out.print("moovee ka prakaar darj karen: ");
	String type= sc.nextLine();
	System.out.print("naayak ka naam darj karen: ");
	String hero= sc.nextLine();
	System.out.print("naayika ka naam darj karen: ");
	String heroine= sc.nextLine();
	System.out.print("philm ka bajat darj karen: ");
	int budget=sc.nextInt();
	mo[i]=new movie_info(name,type,hero,heroine,budget);

```
        }
        for(int i=0;i<n;i++){
            int min_index=i;
            for (int j=i;j<n;j++){
                if(mo[j].budget<mo[min_index].budget){
                    min_index=j;
                }
                movie_info a = mo[min_index];
                mo[i]=mo[min_index];
                mo[min_index]=a;
            }
        }
        System.out.println("Movie Name \t Movie Type \t Hero \t Heroine \t Budget");
        System.out.println("-------------------------------------------------------------------------------");
        for(int i=n-1;i>=0;--i){
            mo[i].display();
        }
    }
}
```

RESULT:

```
Enter the number of movies: 3
philm ka naam darj karen: Heropanti
moovee ka prakaar darj karen: Action?
naayak ka naam darj karen: Tiger
naayika ka naam darj karen: Kriti
philm ka bajat darj karen: 50
philm ka naam darj karen: Simmba
moovee ka prakaar darj karen: Drama
naayak ka naam darj karen: ranveer
naayika ka naam darj karen: Sara Ali Khan
philm ka bajat darj karen: 70
philm ka naam darj karen: Aitraj
moovee ka prakaar darj karen: Thriller
naayak ka naam darj karen: paisa hi paisa hoga babu bhaiya
naayika ka naam darj karen: kareena
philm ka bajat darj karen: 150
============================================================
------------------------------------------------
Movie Name: Heropanti
Movie Type: Action?
Hero: Tiger
Heroine: Kriti
Budget: 50
------------------------------------------------
```

```
---------------------------------------------
Movie Name: Simmba
Movie Type: Drama
Hero: ranveer
Heroine: Sara Ali Khan
Budget: 70
---------------------------------------------
---------------------------------------------
Movie Name: Aitraj
Movie Type: Thriller
Hero: paisa hi paisa hoga babu bhaiya
Heroine: kareena
Budget: 150
---------------------------------------------
=============================================
Movies names Starting with 'S' and 'A' are:
Movie Name: Simmba
Movie Type: Drama
Hero: ranveer
Heroine: Sara Ali Khan
Budget: 70
Movie Name: Aitraj
Movie Type: Thriller
Hero: paisa hi paisa hoga babu bhaiya
Heroine: kareena
Budget: 150
=============================================
```

CONCLUSION :	We learned to solve programs on Arrays and Arrays of Objects