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Department of Computer Engineering

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ROLL NO: 54

DIV:2 BATCH:C

Experiment No.7
2D Array
Date of Performance:15/09/23
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Aim :- To use 2D arrays for solving given problem.

Objective:- To use 2D array concept in java to solve real world problem.

Theory:-

- An array is used to store a fixed-size sequential collection of data of the same type.
- An array can be init in two ways:
  1. Initializing at the time of declaration:

     dataType[] myArray = {value0, value1, ..., valuek};
  2. Dynamic declaration:

     dataType[] myArray = new dataType[arraySize];

     myArray[index] = value;
- Two – dimensional array is the simplest form of a multidimensional array. Data of only same data type can be stored in a 2D array.Data in a 2D Array is stored in a tabular manner which can be represented as a matrix.
- A 2D Array can be declared in 2 ways:
  1. Intializing at the time of declaration:

     dataType[][] myArray = { {valueR1C1, valueR1C2...}, {valueR2C1, valueR2C2...},..}
  2. Dynamic declaration:

     dataType[][] myArray = new dataType[x][y];

     myArray[row_index][column_index] = value;

Code:-

1) Arrays

```
import java.util.*;


class Array{

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

```
    Scanner sc = new Scanner(System.in);

    int size = 5;

    int arr[] =  new int[size];
    System.out.println("Enter Elements of the Array : ");
    for(int i = 0 ; i < size; i++ ){
       arr[i] = sc.nextInt();
    }
   int n = arr.length;
   System.out.println("Given list");

   for(int i=0 ; i<n; i++)
     System.out.println(arr[i]);
     int j = 0 ;
     for(int i=0 ; i<n-1 ; i++){
       if(arr[i]<arr[i+1]){
           int temp = arr[i];
           arr[i] = arr[i+1];
           arr[i+1] = temp ;
           i = -1;
       }
     }
   System.out.println("Afte sorting array : ");

     for(int i=0;i<5;i++){
       System.out.println(arr[i]+" ");
     }

   }
}
```

```
C:\Users\GAURAV\OneDrive\Desktop>java Array
Enter Elements of the Array :
45
50
23
12
89
Given list
45
50
23
12
89
Afte sorting array :
89
50
45
23
12
```

2)

```
public class Array1 {
   public static void main(String args[]){

      int x=10 , y=10;
         System.out.println("The Required Output is : ");
         int arr[][] =  new int[10][10];
         for(int i=0;i<10;i++){
           y=10;
           for(int j=0 ;j<10;j++){
             arr[i][j]= x * y ;
             System.out.print(arr[i][j] + " ");
             y++;
           }
          System.out.println();
          x++;
         }

   }
}
```

```
C:\Users\GAURAV\OneDrive\Desktop>java Array1
The Required Output is :
100 110 120 130 140 150 160 170 180 190
110 121 132 143 154 165 176 187 198 209
120 132 144 156 168 180 192 204 216 228
130 143 156 169 182 195 208 221 234 247
140 154 168 182 196 210 224 238 252 266
150 165 180 195 210 225 240 255 270 285
160 176 192 208 224 240 256 272 288 304
170 187 204 221 238 255 272 289 306 323
180 198 216 234 252 270 288 306 324 342
190 209 228 247 266 285 304 323 342 361
```

3)

```
public class Array2 {
public static void main(String args[]){

    Product[] obj = new Product[5];

    obj[0] = new Product(23907 , "DEll Laptop");
     obj[1] = new Product(91240 , "MacBook");
      obj[2] = new Product(29823,"LG OLED TV (42 inch)");
        obj[3] = new Product(11908,"MI Note pro MAX 9");
         obj[4] = new Product(43590,"Kingston USB");

 System.out.println("Product Object 1 :");
 obj[0].display();
 System.out.println("Product Object 2 : ");
 obj[1].display();
 System.out.println("Product Object 3 : ");
 obj[2].display();
 System.out.println("Product Object 4 : ");
 obj[3].display();
 System.out.println("Product Object 5 : ");
 obj[4].display();

} }

class Product{
int pro_Id;
String pro_name;
Product(int pid , String n )
{
   pro_Id = pid ;
   pro_name = n ;
}
public void display(){
   System.out.print("Product Id =" + pro_Id + " "+ "Product Name = "+pro_name);
```

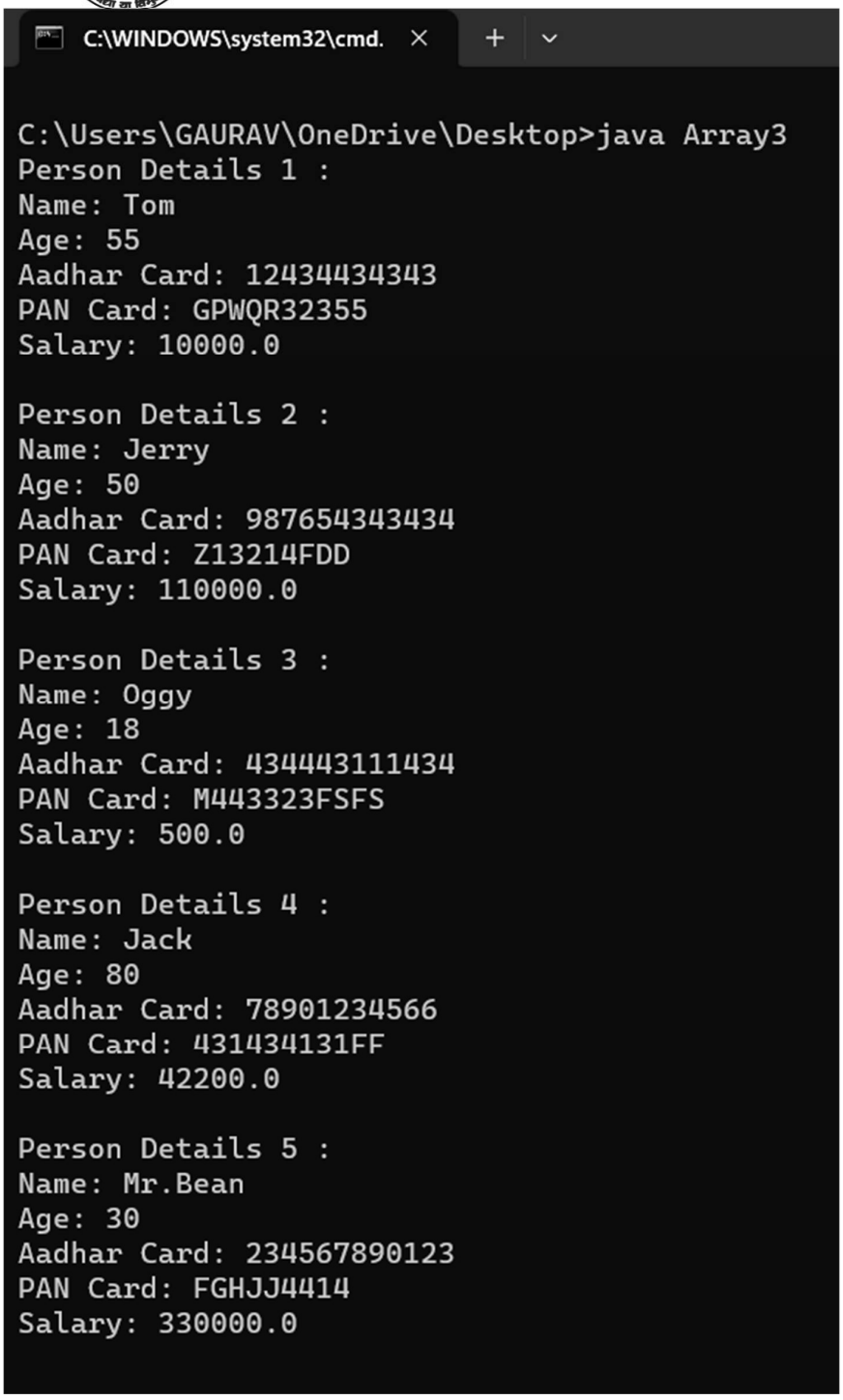
```
        System.out.println();
    }
}
```

```
C:\Users\GAURAV\OneDrive\Desktop>java Array2
Product Object 1 :
Product Id =23907 Product Name = DEll Laptop
Product Object 2 :
Product Id =91240 Product Name = MacBook
Product Object 3 :
Product Id =29823 Product Name = LG OLED TV (42 inch)
Product Object 4 :
Product Id =11908 Product Name = MI Note pro MAX 9
Product Object 5 :
Product Id =43590 Product Name = Kingston USB
```

4)

```
import java.util.*;

public class Array3 {
    public static void main(String args[]) {

        Person[] people = new Person[5];

        people[0] = new Person("12434434343", "GPWQR32355", 55, "Tom", 10000);
        people[1] = new Person("987654343434", "Z13214FDD", 50, "Jerry", 110000);
        people[2] = new Person("434443111434", "M443323FSFS", 18, "Oggy", 500);
        people[3] = new Person("78901234566", "431434131FF", 80, "Jack", 42200);
        people[4] = new Person("234567890123", "FGHJJ4414", 30, "Mr.Bean", 330000);

        System.out.println("Person Details 1 :");
        people[0].display();
        System.out.println("Person Details 2 : ");
        people[1].display();
        System.out.println("Person Details 3 : ");
        people[2].display();
        System.out.println("Person Details 4 : ");
        people[3].display();
        System.out.println("Person Details 5 : ");
        people[4].display();
    }
}

class Person {
    String aadharCard;
```

```
    String panCard;
    int age;
    String name;
    double salary;

    Person(String aadhar, String pan, int personAge, String personName, double personSalary) {
        aadharCard = aadhar;
        panCard = pan;
        age = personAge;
        name = personName;
        salary = personSalary;
    }

    public void display() {
        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
        System.out.println("Aadhar Card: " + aadharCard);
        System.out.println("PAN Card: " + panCard);
        System.out.println("Salary: " + salary);
        System.out.println();
    }
}
```


C:\WINDOWS\system32\cmd.
C:\Users\GAURAV\OneDrive\Desktop>java Array3
Person Details 1 :
Name: Tom
Age: 55
Aadhar Card: 12434434343
PAN Card: GPWQR32355
Salary: 10000.0
Person Details 2 :
Name: Jerry
Age: 50
Aadhar Card: 987654343434
PAN Card: Z13214FDD
Salary: 110000.0
Person Details 3 :
Name: Oggy
Age: 18
Aadhar Card: 4344443111434
PAN Card: M443323FSFS
Salary: 500.0
Person Details 4 :
Name: Jack
Age: 80
Aadhar Card: 78901234566
PAN Card: 431434131FF
Salary: 42200.0
Person Details 5 :
Name: Mr.Bean
Age: 30
Aadhar Card: 234567890123
PAN Card: FGHJJ4414
Salary: 330000.0

Conclusion:-

In Java, an array is a container object that holds a fixed number of values of a single type. The length of an array is established when the array is created. After creation, its length is fixed. Each item in an array is called an element, and each element is accessed by its numerical index. Arrays offer a convenient means of grouping related information.
In Java, an array of objects, also known as an object array, is similar to an array of a primitive type. The main difference is that the array of objects holds references to objects, while the primitive type array holds actual values. Each element of an object array is initialized to `null`. To use the array, we must instantiate each element separately, which gives us flexibility in creating arrays with elements of different types (as long as they share a common superclass). However, this also means we need to manage the instantiation of individual elements, unlike with primitive arrays. In conclusion, an array of objects provides a way to store multiple instances of complex data types or objects.