Experiment No. 6
Implement a program on 2D array & strings functions.
Date of Performance:
Date of Submission:

Aim: To use 2D arrays and Strings for solving given problem.

Objective: To use 2D array concept and strings 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;

In Java, string is basically an object that represents sequence of char values. An array of characters works same as Java string. **Java String** class provides a lot of methods to perform operations on strings such as compare(), concat(), equals(), split(), length(), replace(), compareTo(), intern(), substring() etc.

1.String literal

To make Java more memory efficient (because no new objects are created if it exists already in the string constant pool).

Example:

String demoString = "GeeksforGeeks";

2. Using new keyword

- String s = new String("Welcome");
- In such a case, JVM will create a new string object in normal (non-pool) heap memory and the literal "Welcome" will be placed in the string constant pool. The variable s will refer to the object in the heap (non-pool)

Example:

String demoString = new String ("GeeksforGeeks");

Code:

1)1D Array

code:

```
import java.util.Scanner;
 class Array
{
 public static void main(String[] args)
{
 int i, n;
 Scanner sc=new Scanner(System.in);
 System.out.println("Enter Number of elements in an Array :");
 n = sc.nextInt();
 int Array[] = new int[n];
 System.out.println("Enter the elements :");
 for(i=0;i<n;i++)
 {
 Array[i]=sc.nextInt();
 }
```

```
System.out.println("elements in the array are:");

for(i=0;i<n;i++)
{
System.out.println(Array[i]);
}
}
}
```

OUTPUT:

```
Microsoft Windows [Version 10.0.22631.4169]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Sharvari A Bhondekar>cd/

C:\>cd "C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6"

C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>javac Array.java

C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>java Array.java
Enter Number of elements in an Array :
5
Enter the elements :
1 2 3 4 5
elements in the array are:
1
2
3
4
5
```

2)2D Array

code:

```
import java.util.Scanner;
class Matrix
{
public static void main(String[] args)
{
int i,j,r,c;
Scanner sc=new Scanner(System.in);
```

```
System.out.println("Enter Number of rows :");
r = sc.nextInt();
System.out.println("Enter number of columns:");
c = sc.nextInt();
int Matrix[][]= new int[r][c];
System.out.println("Enter the elements :");
for(i=0;i<r;i++) { for(j=0;j<c;j++)
{
Matrix[i][j]=sc.nextInt();
}
System.out.println(" ");
}
System.out.println("elements in the array are:");
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
System.out.print(Matrix[i][j] + " ");
}
System.out.println(" ");
}
}
}
```

OUTPUT:

```
C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>javac Matrix.java

C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>java Matrix.java
Enter Number of rows :
2
Enter number of columns:
2
Enter the elements :
1
2

3
4

elements in the array are:
1 2
3 4
```

3)STRINGS

code:

```
class Work
{
int id; String name;
Work(String s, int i)
{
id=i;
name=s;
}
public static void main(String args[])
{
Work work=new Work("Sharvari",06);
System.out.println("Emp name:\t"+ work.name+"\tid: \t"+work.id);
}
}
```

OUTPUT:

```
C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>javac Work.java

C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>java Work.java
Emp name:       Sharvari        id:     6

C:\Users\Sharvari A Bhondekar\OneDrive\Desktop\JAVA PROGRAMS\Exp 6>
```

Conclusion:

Comment on how you have used the concept of string and 2D array.

2D Array:

- In my 2D array program, I used **nested loops** to input and display elements in a matrix format. By defining rows and columns, I demonstrated how to store and handle tabular data efficiently, which can be applied in matrix operations and grid-like structures.

Strings:

- In my string example, I created an object of the work class to store and print a name and ID. This shows how I used **object-oriented programming** concepts to manage text and numbers, encapsulating both properties within the class and displaying them together.