Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)

Experiment No 3

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Aim: -To Implement Array, String and Vector in Java.

1. Lab Assignments to complete in this session

i. WAP to find whether the entered 4 digit number is vampire or not. Combination of digits from this number forms 2-digit number. When they are multiplied by each other we get the original number. (1260=21*60, 1395=15*93, 1530=30*51)

Code:

q1.java > q1 > main(String[])

```java
import java.util.Scanner;

class q1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner myObj = new Scanner(System.in);

        System.out.println(x:"Enter a 4-digit number");
        int n = myObj.nextInt();
        int temp = n;
        int[] a = new int[4];

        for (int i = 3; i >= 0; i--) {
            a[i] = temp % 10;
            temp /= 10;
        }

        boolean result = false;

        for (int i = 0; i < 4; i++) {
            for (int j = 0; j < 4; j++) {
                if (i != j) {
                    int num1 = a[i] * 10 + a[j];
                    int num2 = (a[3 - i] * 10 + a[3 - j]);

                    if (num1 * num2 == n) {
                        result = true;
                        break;
                    }
                }
            }
            if (result) {
                break;
            }
        }

        if (result) {
            System.out.println(n + " is a Vampire number.");
        } else {
            System.out.println(n + " is not a Vampire number.");
        }
    }
}
```

```
PS C:\Users\dk\Desktop\assignment\sem5\java\exp 3\exp 3> javac q1.java
PS C:\Users\dk\Desktop\assignment\sem5\java\exp 3\exp 3> java q1
Enter a 4-digit number
1260
1260 is a Vampire number.
```

```
PS C:\Users\dk\Desktop\assignment\sem5\java\exp 3\exp 3> java q1
Enter a 4-digit number
1234
1234 is not a Vampire number.
```

ii. WAP to display the following using irregular arrays

1
2 3
4 5 6

Code:

q2.java > q2 > main(String[])

```java
import java.util.Scanner;

public class q2{
    Run | Debug
    public static void main(String[] args) {
        Scanner myObj = new Scanner(System.in);

        System.out.println(x:"Enter the number of rows for the irregular array:");
        int numRows = myObj.nextInt();

        int[][] irregularArray = new int[numRows][];

        int count = 1;
        for (int i = 0; i < numRows; i++) {
            irregularArray[i] = new int[i + 1];
            for (int j = 0; j < i + 1; j++) {
                irregularArray[i][j] = count++;
            }
        }
        System.out.println(x:"Irregular Array:");
        for (int i = 0; i < numRows; i++) {
            for (int j = 0; j < irregularArray[i].length; j++) {
                System.out.print(irregularArray[i][j] + " ");
            }
            System.out.println();
        }
    }
}
```

Output:

```
Enter the number of rows for the irregular array:
3
Irregular Array:
1
2 3
4 5 6
```

iii. WAP a java program for the following problem statement

You have been given an array of positive integers A1,A2,...,An with legnth N and you have to print an array of same legnth(N) where the values in the new array are the sum of every number in the array, except the number at that index.

Input:

The first line of input contains a single integer T denoting the number of test cases.
Each test cases contain two lines.First line contains N, the length of the array and second line contains N space separated positive integers.

Output:

For each test case, output a single array of same length.

Constraints:

$1 \leq T \leq 100$
$1 \leq N \leq 105$
$0 <= A[i] <= 109$

Example:

Input
2
4
1 2 3 4
3
4 5 6
Output
9 8 7 6
11 10 9

question_3.java > question_3 > main(String[])

```java
import java.util.Scanner;

public class  question_3 {
    Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println(x:"Enter the no. of tests: ");
        int T = sc.nextInt();

        while (T-- > 0) {
            System.out.println(x:"Enter the length of the array: ");
            int N = sc.nextInt();
            int[] arr = new int[N];
            long[] result = new long[N];

            System.out.println(x:"Enter the array: ");
            for (int i = 0; i < N; i++) {
                arr[i] = sc.nextInt();
            }

            long totalSum = 0;
            for (int i = 0; i < N; i++) {
                totalSum += arr[i];
            }

            for (int i = 0; i < N; i++) {
                result[i] = totalSum - arr[i];
            }

            for (int i = 0; i < N; i++) {
                System.out.print(result[i] + " ");
            }
            System.out.println();
        }
        sc.close();
    }
}
```

```
Enter the no. of tests:
2
Enter the length of the array:
4
Enter the array:
1
2
3
4
9 8 7 6
Enter the length of the array:
3
Enter the array:
4
5
6
11 10 9
```

iv. WAP that accepts a shopping list of items and performs the following operations: Add an item at a specified location, delete an item in the list, and print the contents of the vector

Code:

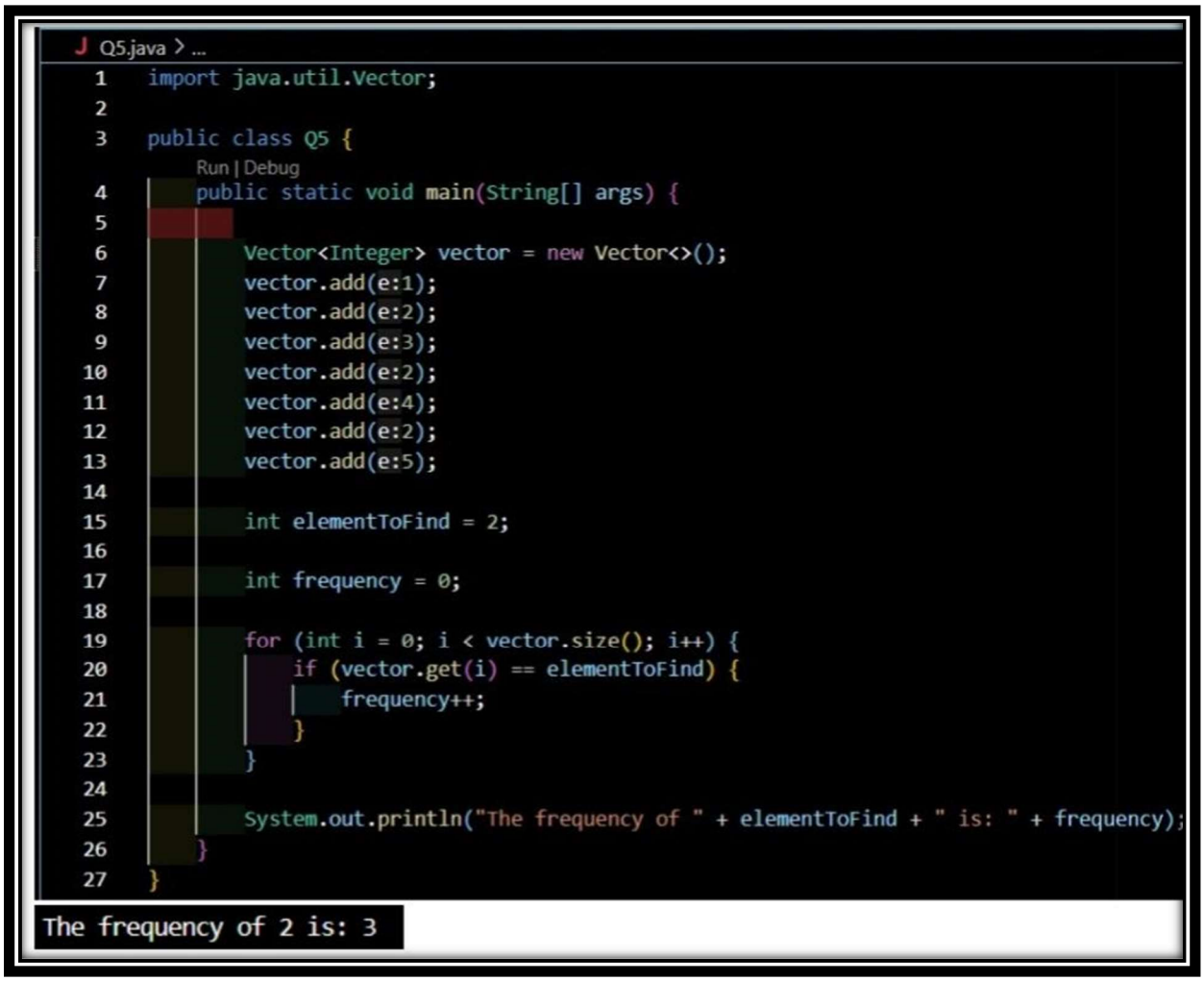
Q4.java > ...

```java
import java.util.Scanner;
import java.util.Vector;

public class Q4 {
    Run | Debug
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Vector<String> shoppingList = new Vector<>();

        while (true) {
            System.out.println(x:"Shopping List Menu:");
            System.out.println(x:"1. Add item");
            System.out.println(x:"2. Delete item");
            System.out.println(x:"3. Print shopping list");
            System.out.println(x:"4. Exit");
            System.out.print(s:"Enter your choice: ");

            int choice = scanner.nextInt();
            scanner.nextLine();

            switch (choice) {
                case 1:
                    System.out.print(s:"Enter the item to add: ");
                    String itemToAdd = scanner.nextLine();
                    System.out.print(s:"Enter the index where you want to add the item: ");
                    int indexToAdd = scanner.nextInt();
                    shoppingList.add(indexToAdd, itemToAdd);
                    System.out.println(itemToAdd + " has been added to the shopping list.");
                    break;
                case 2:
                    System.out.print(s:"Enter the index of the item to delete: ");
                    int indexToDelete = scanner.nextInt();
                    if (indexToDelete >= 0 && indexToDelete < shoppingList.size()) {
                        String deletedItem = shoppingList.remove(indexToDelete);
                        System.out.println(deletedItem + " has been removed from the shopping list.");
                    } else {
                        System.out.println("Invalid index. The shopping list does not contain an item at index " + indexToDelete + ".");
                    }
                    break;
                case 3:
                    System.out.println(x:"Shopping List:");
                    for (int i = 0; i < shoppingList.size(); i++) {
                        System.out.println(i + ". " + shoppingList.get(i));
                    }
                    break;
                case 4:
                    System.out.println(x:"Exiting the program.");
                    scanner.close();
                    System.exit(status:0);
                default:
                    System.out.println(x:"Invalid choice. Please enter a valid option.");
            }
        }
    }
}
```

Outpuyt:

```
Shopping List Menu:
1. Add item
2. Delete item
3. Print shopping list
4. Exit
Enter your choice: 1
Enter the item to add: apple
Enter the index where you want to add the item: 0
apple has been added to the shopping list.
Shopping List Menu:
1. Add item
2. Delete item
3. Print shopping list
4. Exit
Enter your choice: 3
Shopping List:
0. apple
Shopping List Menu:
1. Add item
2. Delete item
3. Print shopping list
4. Exit
Enter your choice: 2
Enter the index of the item to delete: 0
apple has been removed from the shopping list.
```

v. Write a java programs to find frequency of an element in the given Vector array.



```
Q5.java > ...
1   import java.util.Vector;
2
3   public class Q5 {
        Run | Debug
4       public static void main(String[] args) {
5
6           Vector<Integer> vector = new Vector<>();
7           vector.add(e:1);
8           vector.add(e:2);
9           vector.add(e:3);
10          vector.add(e:2);
11          vector.add(e:4);
12          vector.add(e:2);
13          vector.add(e:5);
14
15          int elementToFind = 2;
16
17          int frequency = 0;
18
19          for (int i = 0; i < vector.size(); i++) {
20              if (vector.get(i) == elementToFind) {
21                  frequency++;
22              }
23          }
24
25          System.out.println("The frequency of " + elementToFind + " is: " + frequency);
26      }
27  }
```

```
The frequency of 2 is: 3
```

Code:

vi. WAP to check if 2 strings are Meta strings or not. Meta strings are the strings which can be made equal by exactly one swap in any of the strings. Equal string are not considered here as Meta strings.

Example: str1 = "geeks", str2 = "keegs"
By just swapping 'k' and 'g' in any of string, both will become same.
Example: str1 = "Converse", str2 = "Conserve"
By just swapping 'v' and's' in any of string, both will become same. Algorithm (if reqd):
1. Check if both strings are of equal length or not, if not return false.
2. Otherwise, start comparing both strings and count number of unmatched characters and also store the index of unmatched characters.
3. If unmatched characters are more than 2 then return false.
4. Otherwise check if on swapping any of these two characters in any string would make the string equal or not.
5. If yes then return true. Otherwise return false.

Code:

q6.java > ...

```java
import java.util.Scanner;

public class q6 {
    Run | Debug
    public static void main(String[] args) {
        Scanner myObj = new Scanner(System.in);

        System.out.println(x:"Enter string");
        String s1 = myObj.nextLine();
        String s2 = myObj.nextLine();

        boolean isMetaString = false;

        if (s1.length() != s2.length()) {
            isMetaString = false;
        } else {
            for (int i = 0; i < s1.length(); i++) {
                for (int j = i + 1; j < s1.length(); j++) {
                    char[] s1Array = s1.toCharArray();
                    char temp = s1Array[i];
                    s1Array[i] = s1Array[j];
                    s1Array[j] = temp;
                    String replaced = new String(s1Array);
                    if (replaced.equals(s2)) {
                        isMetaString = true;
                        break;
                    }
                }
                if (isMetaString) {
                    break;
                }
            }
        }

        if (isMetaString) {
            System.out.println(x:" It is a meta string");
        } else {
            System.out.println(x:" It is not a meta string");
        }
    }
}
```

Output:

```
Enter string
geek
keeg
Yes, it is a meta string
```

vii. Write a java program to count number of alphabets, digits, special symbols, blank spaces and words from the given sentence. Also count number of vowels and consonants

Code:

lab.java > ...

```java
import java.util.Scanner;
class lab {
    Run | Debug
    public static void main(String[] args) {
        Scanner myObj = new Scanner(System.in);

        System.out.println(x:"Enter string");
        String s = myObj.nextLine();
        int blank = 0, up = 0, low = 0, special = 0, digi = 0;

        for (int i = 0; i < s.length(); i++) {
            if (s.charAt(i) == ' ') {
                blank++;
            } else if (Character.isUpperCase(s.charAt(i))) {
                up++;
            } else if (Character.isLowerCase(s.charAt(i))) {
                low++;
            } else if (Character.isDigit(s.charAt(i))) {
                digi++;
            } else {
                special++;
            }
        }
        System.out.println(x:"In the enterd string");
        System.out.println("The blank spaces are:" + blank);
        System.out.println("Lower case:" + low);
        System.out.println("Upper case:" + up);
        System.out.println("Digits: " + digi);
        System.out.println("Special characters :" + special);

        int vowel = 0, cons = 0;
        for (int i = 0; i < s.length(); i++) {

            if (s.charAt(i) == 'a' || s.charAt(i) == 'e'
                    || s.charAt(i) == 'i'
                    || s.charAt(i) == 'o'
                    || s.charAt(i) == 'u') {
                vowel++;
            } else {
                cons++;
            }
        }
        System.out.println("Vowel count: " + vowel);
        System.out.println("consonant count:" + cons);

    }
}
```

Output:

```
PS C:\Users\dk\Desktop\assignment\sem5\java\exp 3\exp 3> java lab
Enter string
Hello Divyesh #116
In the enterd string
The blank spaces are:2
Lower case:10
Upper case:2
Digits: 3
Special characters :1
Vowel count: 4
consonant count:14
```