

Java and Scala Laboratory

Experiment – 3

D-12

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1. 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)

```
J question_1.java > ...
1  import java.util.*;
2
3  class question_1 {
4      Run | Debug
5      public static void main(String[] args){
6          Scanner sc = new Scanner(System.in);
7          int number=0;
8          System.out.print(s:"Enter a 4 digit number: ");
9          number = sc.nextInt();
10
11         int arr[] = new int[4];
12
13         int n = number;
14
15         int length = arr.length - 1;
16
17         for(int i=0; i<4; i++){
18             arr[length - i] = n%10;
19             n = n/10;
20         }
21
22         for(int i=0; i<arr.length; i++){
23             System.out.println(arr[i]);
24         }
25
26         int combos[] = new int[6];
27
28         System.out.println(x:"the first combos are: ");
29         int index = 0;
```

```
30     for(int i=0; i<arr.length; i++){
31         for(int j=i+1; j<arr.length; j++){
32             int c = arr[i]*10 + arr[j];
33             if(c!=0){
34                 combos[index] = c;
35                 System.out.println(c);
36                 index++;
37             }
38         }
39     }
40 }
41
42 System.out.println(x:"combos: ");
43
44 for(int i=0; i<6; i++){
45     System.out.println(combos[i]);
46 }
47
48 System.out.println(x:"hi");
49
50 int arr2[] = new int[4];
51
52 for(int j=0; j<4; j++){
53     arr2[j] = arr[length - j];
54 }
55
56 System.out.println(x:"the new array is: " );
57
58 for(int k=0; k<arr2.length; k++){
59     System.out.println(arr2[k ]);
60 }
```

```

62     System.out.println(x:"the new combos are:" );
63
64     int combos2[] = new int[6];
65     int index2 = 0;
66
67     for(int l=0; l<arr2.length; l++){
68         for(int m=l+1; m<arr2.length; m++){
69             int c = arr2[l]*10 + arr2[m];
70             if(c!=0){
71                 combos2[index2] = c;
72                 System.out.println(c);
73                 index2++;
74             }
75         }
76     }
77
78
79     System.out.println(x:"combos2: ");
80
81     for(int p=0; p<6; p++){
82         System.out.println(combos2[p]);
83     }
84
85     int newcombo[] = new int[12];
86     ....
87     for(int i=0; i<combos.length; i++){
88         newcombo[i] = combos[i];
89         ....
90     }
91     for(int i=6; i<newcombo.length; i++){
92         newcombo[i] = combos2[i-6];
93         ....
94     }

```

```

94     for(int i=0; i<newcombo.length; i++){
95         System.out.println("the main combo is: " + newcombo[i]);
96     }
97
98     for(int i=0; i<newcombo.length; i++){
99         for(int j=i+1; j<newcombo.length; j++){
100             if(newcombo[i]*newcombo[j] == number){
101                 System.out.println(x:"The number is a vampire number!");
102             }
103         }
104     }
105
106 }}

```

```
Enter a 4 digit number: 1260
1
2
6
0
the first combos are:
12
16
10
26
20
60
combos:
12
16
10
26
20
60
hi
the new array is:
0
6
2
1
the new combos are:
6
2
1
62
61
21
```

```
combos2:
6
2
1
62
61
21
the main combo is: 12
the main combo is: 16
the main combo is: 10
the main combo is: 26
the main combo is: 20
the main combo is: 60
the main combo is: 6
the main combo is: 2
the main combo is: 1
the main combo is: 62
the main combo is: 61
the main combo is: 21
The number is a vampire number!
```

Q2. WAP to display the following using irregular arrays

1

2 3

4 5 6

```
J question_2.java > ...
1 import java.util.Scanner;
2
3 public class question_2{
4     Run | Debug
5     public static void main(String[] args) {
6         Scanner myObj = new Scanner(System.in);
7
8         System.out.println(x:"Enter the number of rows for the irregular array:");
9         int numRows = myObj.nextInt();
10
11         int[][] irregularArray = new int[numRows][];
12
13         int count = 1;
14         for (int i = 0; i < numRows; i++) {
15             irregularArray[i] = new int[i + 1];
16             for (int j = 0; j < i + 1; j++) {
17                 irregularArray[i][j] = count++;
18             }
19         }
20         System.out.println(x:"Irregular Array:");
21         for (int i = 0; i < numRows; i++) {
22             for (int j = 0; j < irregularArray[i].length; j++) {
23                 System.out.print(irregularArray[i][j] + " ");
24             }
25             System.out.println();
26         }
27     }
}
```

Enter the number of rows for the irregular array:

4

Irregular Array:

1

2 3

4 5 6

7 8 9 10

iii. WAP a java program for the following problem statement

You have been given an array of positive integers A_1, A_2, \dots, A_n with length N and you have to print an array of same length (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:

$$1 \leq T \leq 100$$

$$1 \leq N \leq 105$$

$$0 \leq A[i] \leq 109$$

Example:

Input

2

4

1 2 3 4

3

4 5 6

Output

9 8 7 6

11 10 9

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

```
1  import java.util.Scanner;
2
3  public class question_3 {
4      Run | Debug
5      public static void main(String[] args) {
6          Scanner sc = new Scanner(System.in);
7          System.out.println(x:"Enter the no. of tests: ");
8          int T = sc.nextInt();
9
10         while (T-- > 0) {
11             System.out.println(x:"Enter the length of the array: ");
12             int N = sc.nextInt();
13             int[] arr = new int[N];
14             long[] result = new long[N];
15
16             System.out.println(x:"Enter the array: ");
17             for (int i = 0; i < N; i++) {
18                 arr[i] = sc.nextInt();
19             }
20
21             long totalSum = 0;
22             for (int i = 0; i < N; i++) {
23                 totalSum += arr[i];
24             }
25
26             for (int i = 0; i < N; i++) {
27                 result[i] = totalSum - arr[i];
28             }
29
30             for (int i = 0; i < N; i++) {
31                 System.out.print(result[i] + " ");
32             }
33
34             System.out.println();
35         }
36     }
37 }
```

```
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


```

J Q4.java > ...
1  import java.util.Scanner;
2  import java.util.Vector;
3
4  public class Q4 {
5      Run | Debug
6      public static void main(String[] args) {
7          Scanner scanner = new Scanner(System.in);
8          Vector<String> shoppingList = new Vector<>();
9
10         while (true) {
11             System.out.println(x:"Shopping List Menu:");
12             System.out.println(x:"1. Add item");
13             System.out.println(x:"2. Delete item");
14             System.out.println(x:"3. Print shopping list");
15             System.out.println(x:"4. Exit");
16             System.out.print(s:"Enter your choice: ");
17
18             int choice = scanner.nextInt();
19             scanner.nextLine();
20
21             switch (choice) {
22                 case 1:
23                     System.out.print(s:"Enter the item to add: ");
24                     String itemToAdd = scanner.nextLine();
25                     System.out.print(s:"Enter the index where you want to add the item: ");
26                     int indexToAdd = scanner.nextInt();
27                     shoppingList.add(indexToAdd, itemToAdd);
28                     System.out.println(itemToAdd + " has been added to the shopping list.");
29                     break;
30
31                 case 2:
32                     System.out.print(s:"Enter the index of the item to delete: ");
33                     int indexToDelete = scanner.nextInt();
34                     if (indexToDelete >= 0 && indexToDelete < shoppingList.size()) {
35                         String deletedItem = shoppingList.remove(indexToDelete);
36                         System.out.println(deletedItem + " has been removed from the shopping list.");
37                     } else {
38                         System.out.println("Invalid index. The shopping list does not contain an item at index " + indexToDelete + ".");
39                     }
40                     break;
41
42                 case 3:
43                     System.out.println(x:"Shopping List:");
44                     for (int i = 0; i < shoppingList.size(); i++) {
45                         System.out.println(i + ". " + shoppingList.get(i));
46                     }
47                     break;
48
49                 case 4:
50                     System.out.println(x:"Exiting the program.");
51                     scanner.close();
52                     System.exit(status:0);
53             default:
54                 System.out.println(x:"Invalid choice. Please enter a valid option.");
55             }
56         }
57     }
58 }

```

```
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.

```
J Q5.java > ...
1  import java.util.Vector;
2
3  public class Q5 {
4      Run | Debug
5      public static void main(String[] args) {
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

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.

METHOD – 1

J Temp.java > Temp > areMetaStrings(String, String)

```
1  public class Temp {
    Run | Debug
2      public static void main(String[] args) {
3          String str1 = "geeks";
4          String str2 = "keegs";
5          .....
6          if (areMetaStrings(str1, str2)) {
7              System.out.println(x:"The strings are meta strings.");
8          } else {
9              System.out.println(x:"The strings are not meta strings.");
10         }
11     }
12
13     public static boolean areMetaStrings(String str1, String str2) {
14
15         if (str1.length() != str2.length()) {
16             return false;
17         }
18
19         int unmatchedCount = 0;
20         int firstUnmatchedIndex = -1;
21         int secondUnmatchedIndex = -1;
22
23         for (int i = 0; i < str1.length(); i++) {
24             if (str1.charAt(i) != str2.charAt(i)) {
25                 unmatchedCount++;
26
27                 if (unmatchedCount == 1) {
28                     firstUnmatchedIndex = i;
29                 } else if (unmatchedCount == 2) {
30                     secondUnmatchedIndex = i;
31                 }
32             }
33         }
34
35         if (unmatchedCount != 2) {
36             return false;
37         }
38
39         if (str1.charAt(firstUnmatchedIndex) == str2.charAt(secondUnmatchedIndex) &&
40             str1.charAt(secondUnmatchedIndex) == str2.charAt(firstUnmatchedIndex)) {
41             return true;
42         }
43
44         return false;
45     }
46 }
```

The strings are meta strings.

METHOD - 2

```
1 public class Q6 {
    Run | Debug
2     public static void main(String[] args) {
3         String s1 = "geeks";
4         System.out.println("First string is: " + s1);
5         String s2 = "keegs";
6         System.out.println("Second string is: " + s2);
7
8         int z = 0;
9         int xor = 0;
10
11        for (int i = 0; i < s1.length(); i++){
12            xor ^= s1.charAt(i)^s2.charAt(i);
13        }
14
15        if(xor == 0) { System.out.println(x:"yes ") ;}
16        else{ System.out.println(x:"no");}
17
18
19
20        if(z>0){
21            System.out.print(s:"They are Meta Strings!");
22        }
23    }
24 }
```

First string is: geeks
Second string is: keegs
yes

- 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

```

1  public class Q3 {
    Run | Debug
2  public static void main(String[] args) {
3      String string = "This is a Java and Scala Laboratory!";
4
5      int upperCaseCount = 0;
6      int lowerCaseCount = 0;
7      int blankSpaceCount = 0;
8      int digitCount = 0;
9      int specialCharacterCount = 0;
10
11     for (int i = 0; i < string.length(); i++) {
12         char charAt = string.charAt(i);
13
14         if (Character.isUpperCase(charAt)) {
15             upperCaseCount++;
16         } else if (Character.isLowerCase(charAt)) {
17             lowerCaseCount++;
18         } else if (Character.isWhitespace(charAt)) {
19             blankSpaceCount++;
20         } else if (Character.isDigit(charAt)) {
21             digitCount++;
22         } else {
23             specialCharacterCount++;
24         }
25     }
26
27     System.out.println("Uppercase characters: " + upperCaseCount);
28     System.out.println("Lowercase characters: " + lowerCaseCount);
29     System.out.println("Blank spaces: " + blankSpaceCount);
30     System.out.println("Digits: " + digitCount);
31     System.out.println("Special characters: " + specialCharacterCount);
32 }
33 }

```

```

Uppercase characters: 4
Lowercase characters: 25
Blank spaces: 6
Digits: 0
Special characters: 1

```