Programme Name:Bachelor of Computer Science(Hons.)

Course Code: CSC2515

Course Name: Object Oriented Programming

Assignment : A1

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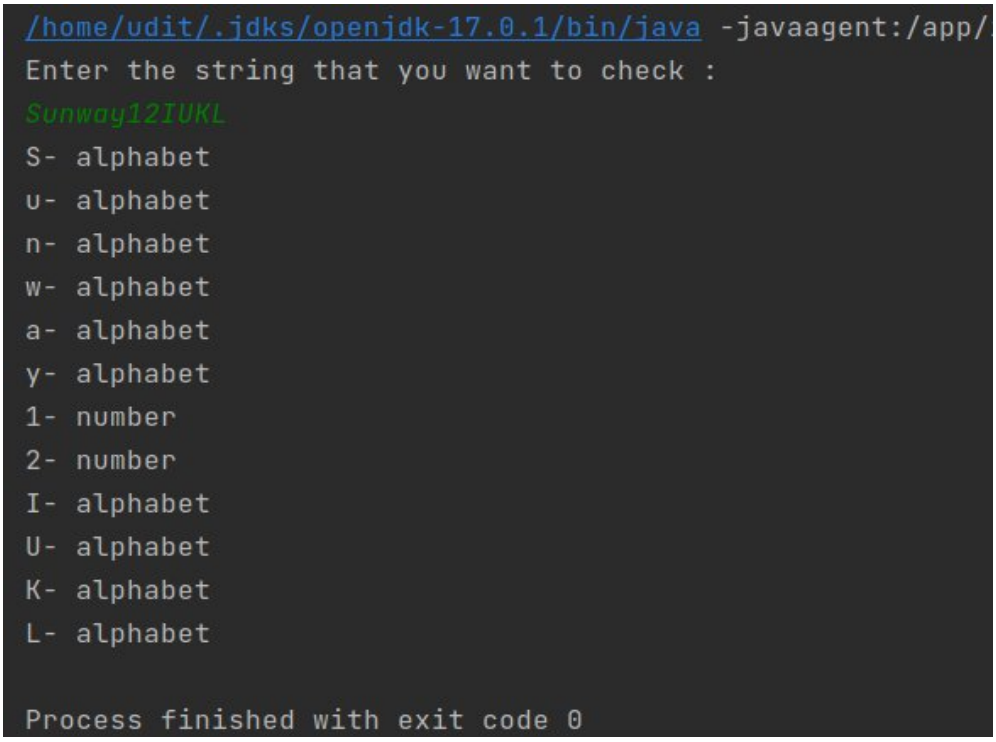
There are THREE (3) questions in this section. Answer ALL Questions in the Answer Booklet.

1. Write JAVA programs that accept alphanumeric strings from the user and identify each character in the string as whether it is alphabet or number.

CODE:-

```
import java.util.Scanner;
public class IdentifyDataType {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the string that you want to check : ");
        String mainStore=sc.nextLine();
        //Defined alphabets and numbers
        String numStore="0123456789";
        String
alphabetStore="abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ";
        //loop to check alphabets
        for(int i=0;i<mainStore.length();i++){
            char st=mainStore.charAt(i);
            //loop to print alphabets
            for (int j=0;j<26;j++){
                if(st==alphabetStore.charAt(j)){
                    System.out.println(st+"- alphabet");
                }
            }
            //loop to print numbers
            for (int k=0;k<10;k++){
                if(st==numStore.charAt(k)){
                    System.out.println(st+"- number");
                }
            }
        }
        sc.close();
    }
}
```

OUTPUT:



2. Explain the concept of a jagged array in JAVA and write a JAVA program to demonstrate a

jagged array.

(10 marks)

Ans:-A jagged array is an array of arrays whose member arrays can be of different sizes.

That means we can create a 2-D array but with a varying number of columns in each row. These types of arrays are Jagged arrays.

Here is an example of jagged array:-

```
int[][] arr= new int[][]  {
      {10, 20, 30 ,40},
      {50, 60, 70, 80, 90, 100},
      {110, 120},
      {1,2,3,4,5,10}
}
```

CODE:-

```java
// write a JAVA program to demonstrate a jagged array.

public class JaggedArray {
    public static void main(String[] args) {
        //Declared and Initialized jagged array
        int[][] jaggedArr= new int[][]  {
                {10, 20, 30 ,40},
                {50, 60, 70, 80, 90, 100},
                {110, 120},
                {1,2,3,4,5,10}
        };

        //loop to print all the elements of the above jagged array

        System.out.println("Here is the Jagged array ");
        for (int i = 0; i < jaggedArr.length; i++) {
            for (int j = 0; j < jaggedArr[i].length; j++)
                System.out.print(jaggedArr[i][j] + " ");
            System.out.println();
        }
    }
}
```

OUTPUT:-

```
Here is the Jagged array
10 20 30 40
50 60 70 80 90 100
110 120
1 2 3 4 5 10

Process finished with exit code 0
```

3. Write a JAVA program to calculate transpose of a given matrix.

(10 marks)

CODE:

CODE:

```java
//Write a JAVA program to calculate transpose of a given matrix
import java.util.Scanner;
public class TransposeMatrix {
    public static void main(String[] args) {
        //scanner to take input from user
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the 3*3 matrix that you want to transpose :");
        //array to take matrix input
        int [][] matrix=new int[3][3];
        //loop to take matrix as input
        for (int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                matrix[i][j] =sc.nextInt();
            }
        }
        //loop to print the matrix
        System.out.println("The matrix you entered is : ");
        for (int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print(matrix[i][j]+" ");
            }
            System.out.println(" ");
        }
        //loop to transpose the matrix
        System.out.println("The transpose of the matrix you entered is : ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print(matrix[j][i]+ " ");
            }
            System.out.println(" ");
        }
    }
}
```

OUTPUT:-

```
Enter the 3*3 matrix that you want to transpose :
1 2 3
4 5 6
7 8 9
The matrix you entered is :
1 2 3
4 5 6
7 8 9
The transpose of the matrix you entered is :
1 4 7
2 5 8
3 6 9

Process finished with exit code 0
```