1. An organization took up the exercise to find the Body Mass Index (BMI) of all the persons in a team of 10 members. For this create a program to find the BMI and display the height, weight, BMI, and status of each individual

```
import java.util.Scanner;

public class Bmi {
    public static String[][] bmiStatus(double[][] member) {
        String[][] output = new String[member.length][2];
        for (int i = 0; i < member.length; i++) {
            double heightInMeters = member[i][1] / 100.0;
            double bmi = member[i][0] / (heightInMeters * heightInMeters);

            String status;
            if (bmi <= 18.4) {
                status = "Underweight";
            } else if (bmi <= 24.9) {
                status = "Normal";
            } else if (bmi <= 39.9) {
                status = "Overweight";
            } else {
                status = "Obese";
            }

            output[i][0] = String.format("%.2f", bmi);
            output[i][1] = status;
        }
        return output;
    }

    public static void display(String[][] output,double[][] member) {
System.out.printf("%-12s %-12s %-12s %-12s%n", "Weight(kg)", "Height(cm)", "BMI", "Status");
        for (int i = 0; i < 10; i++) {
            System.out.printf("%-12.2f %-12.2f %-12s %-12s%n",
                    member[i][0], member[i][1], output[i][0], output[i][1]);
        }

    }

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        double[][] member = new double[10][2];

        for (int i = 0; i < 10; i++) {
```

```
            System.out.println("Enter the weight (kg) of member [" + (i + 1) + "]: ");
            member[i][0] = input.nextDouble();
            System.out.println("Enter the height (cm) of member [" + (i + 1) + "]: ");
            member[i][1] = input.nextDouble();
        }

        String[][] output = bmiStatus(member);
        display(output, member);

        input.close();
    }
}
```

2. Find unique characters in a string using the charAt() method and display the result

```
import java.util.Scanner;
public class UnquieCharacter {
    public static int findLength(String str){
        int i=0;
      try{
        while(true){

            str.charAt(i);
            i++;
        }
      }
      catch(IndexOutOfBoundsException e)
      {
      }
      return i;
    }

    public static char[] findUnique(String str){
        int len=findLength(str);
        char[] uniqueArray=new char[len];
        int uniqueindex=0;
        for(int i=0;i<len;i++){
            int count=0;
            for(int j=0;j<len;j++){
                if(str.charAt(i)==str.charAt(j)){
                    count++;
```

```
            }
        }
        if (count==1){
            uniqueArray[uniqueindex]=str.charAt(i);
            uniqueindex++;
        }
    }
    return uniqueArray;
  }
  public static void main(String[] args) {
    Scanner input=new Scanner(System.in);
    System.out.println("Enter the string");
    String str=input.nextLine();
    char[] result=findUnique(str);
   System.out.println("Unique characters in the string is ");
   for(char re:result){
    System.out.println(re);
   }
   input.close();
  }
}
```

3. Write a program to find the first non-repeating character in a string and show the result

```
import java.util.Scanner;
public class Nonrepeating {

  public static char firstNonRepeating(String str){
    int[] freq=new int[256];
    int i=0;

    // using loop to find the frequency of the characters
    for( i=0;i<str.length();i++){
      freq[str.charAt(i)]++;
    }

    for( i=0;i<str.length();i++){
      if(freq[str.charAt(i)]==1){

        break;
      }
```

```
        }
        return  str.charAt(i);
    }

    public static void main(String[] args) {
        Scanner input=new Scanner (System.in);
        System.out.println("Enter a string ");
        String str=input.nextLine();
        char firstchar=firstNonRepeating(str);
        System.out.println("The first non repeating character is "+firstchar);
        input.close();

    }

}
```

4. Write a program to find the frequency of characters in a string using the charAt() method and display the result

```
import java.util.Scanner;
public class FreqencyOfChar {

    public static void frequency(String str){
        int[] freq=new int[256];
         char[] character=new char[str.length()];
        int charindex=0;
        //calculating the frequency for each characters
        for(int i=0;i<str.length();i++){
            freq[str.charAt(i)]++;
            if (freq[str.charAt(i)]==1){
                character[charindex]=str.charAt(i);
                charindex++;
            }

        }
```

```
        for(int i=0;i<charindex;i++){
            System.out.println("Frequency of character "+character[i]+" is "+freq[character[i]]);
        }

    }
    public static void main(String[] args) {
        Scanner input =new Scanner(System.in);
        System.out.println("Enter a string");
        String str=input.nextLine();
        frequency(str);

        input.close();
    }

}
```

5. Write a program to find the frequency of characters in a string using unique characters and display the result

```
import java.util.Scanner;
public class TwoDarrary {
    public static char[] unquieCharacters(String str){
        char[] tempunique=new char[str.length()];
        int uniqueIndex=0;
        for(int i=0;i<str.length();i++){
            int count=0;
            for(int j=i+1;j<str.length();j++){
                if(str.charAt(i)==str.charAt(j)){
                    count++;
                }
            }
            if(count==0){
                tempunique[uniqueIndex]=str.charAt(i);
                uniqueIndex++;
            }
        }
        char[] unique=new char[uniqueIndex];
        for(int i=0;i<uniqueIndex;i++){
            unique[i]=tempunique[i];

        }
        return unique;
```

```
    }
    public static void freq2D(String str){
        int[] freq=new int[256];

        for(int i=0;i<str.length();i++){
       freq[str.charAt(i)]++;
 }

    char[] unique=unquieCharacters(str);
    System.out.println(unique[0]);
    int[][] frequency2D=new int[unique.length][2];
    for(int i=0;i<unique.length;i++){
        frequency2D[i][0]=unique[i];
        frequency2D[i][1]=freq[unique[i]];
    }
     //Displaying the result
    for(int i=0;i<unique.length;i++){
            System.out.println("The frequency of character "+(char)frequency2D[i][0]+" is "+
frequency2D[i][1]);
    }
    }


    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);
        System.out.println("Enter the string");
        String str=input.nextLine();
        freq2D(str);
        input.close();
    }

}
```

9. Create a program to display a calendar for a given month and year. The program should take the month and year as input from the user and display the calendar for that month. E.g. for 07 2005 user input, the program should display the calendar as shown below

```
import java.util.Scanner;

public class CalendarProgram {

    public static String[] getMonths() {
```

```
    return new String[]{
        "January", "February", "March", "April", "May", "June",
        "July", "August", "September", "October", "November", "December"
    };
}

public static int[] getDaysArray() {
    return new int[]{31, 28, 31, 30, 31, 30,
                     31, 31, 30, 31, 30, 31};
}

public static boolean isLeapYear(int year) {
    return (year % 400 == 0) || (year % 4 == 0 && year % 100 != 0);
}

public static int getDaysInMonth(int month, int year) {
    int[] days = getDaysArray();
    if (month == 2 && isLeapYear(year)) {
        return 29;
    }
    return days[month - 1];
}

public static int getFirstDay(int month, int year) {
    int d = 1; // first day of month
    int y0 = year - (14 - month) / 12;
    int x = y0 + y0/4 - y0/100 + y0/400;
    int m0 = month + 12 * ((14 - month) / 12) - 2;
    int d0 = (d + x + (31*m0)/12) % 7;
    return d0; // 0=Sunday, 1=Monday, ... 6=Saturday
}

// Method to print calendar
public static void printCalendar(int month, int year) {
    String[] months = getMonths();
    int days = getDaysInMonth(month, year);
    int firstDay = getFirstDay(month, year);

    // Print header
    System.out.println("     " + months[month - 1] + " " + year);
    System.out.println(" Sun Mon Tue Wed Thu Fri Sat");


    for (int i = 0; i < firstDay; i++) {
```

```
            System.out.print("    ");
        }

        for (int day = 1; day <= days; day++) {
            System.out.printf("%4d", day);
            if ((day + firstDay) % 7 == 0) {
                System.out.println();
            }
        }
        System.out.println();
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter month (1-12): ");
        int month = sc.nextInt();
        System.out.print("Enter year: ");
        int year = sc.nextInt();

        printCalendar(month, year);
        sc.close();
    }
}
```