CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

DEVANG PATEL INSTITUTE OF ADVANCE TECHNOLOGY & RESEARCH

Department of Information Technology

PRACTICAL 1

AIM: In a peaceful town, a budding programmer named Sam was tasked by her mentor, Ms. Java, to declare an integer variable named age, assign it the value of 25, and display it in a sentence. Sam quickly took to her computer and, with focus,wrote a program that would show "25 is the age of Sam." on the screen. Pleased with her work, Sam proudly presented her solution to Ms. Java, who commended her for her precise and clear coding skills.

CODE:

```
public class java1 {

    public static void main(String[] args) {

        System.out.println("23DIT021");

        int age = 25;

        System.out.println(age + " is the age of Sam.");

    }

}
```

OUTPUT:

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java1.java } ; if ($?) { java java1 }
23DIT021
25 is the age of Sam.
PS E:\Java>
```

CONCLUSION :

From the above practical, I got the idea of basic syntaxes in Java language, which will be helpful for me to prevent syntax errors.

PRACTICAL 2

AIM : Java program that converts a string entered by the user to Morsecode or vice versa. It will require the implementation of data structures, including arrays, loops, and conditional statements.

- Create two arrays - one to contain the strings of letters to be converted and one to contain the Morse codes.
- In the program's main method, prompt the user for input to choose between the string or Morse.
- For Morse code conversion, read a string from the user; use conditional statements, looping, and array methods to convert the string to Morse-code.
- For string conversion, read in a Morse-coded string from the user; use arrays, conditional statements, and looping to convert Morse code to a string

CODE:

```
import java.util.Scanner;


public class java2 {
    private static final String[] LETTERS = {"A", "B", "C", "D", "E", "F",
"G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U",
"V", "W", "X", "Y", "Z", "0", "1", "2", "3", "4", "5", "6", "7", "8", "9"};
    private static final String[] MORSE_CODES = {".-", "-...", "-.-.", "-..",
".", "..-.", "--.", "....", "..", ".---", "-.-", ".-..", "--", "-.", "---", ".--.", "--.-", ".-
.", "...", "-", "..-", "...-", ".--", "-..-", "-.--", "--..", "-----", ".----", "..---", "...--
", "....-", ".....", "-....", "--...", "---..", "----."};


    public static void main(String[] args) {
        System.out.println("23DIT021");


        Scanner scanner = new Scanner(System.in);
```

```
        System.out.println("Enter 1 to convert string to Morse code, 2 to
    convert Morse code to string:");
        int choice = scanner.nextInt();

        if (choice == 1) {
            System.out.println("Enter a string to convert to Morse code:");
            String input = scanner.next().toUpperCase();
            String morseCode = convertStringToMorse(input);
            System.out.println("Morse code: " + morseCode);
        } else if (choice == 2) {
            System.out.println("Enter a Morse code to convert to string:");
            String morseCode = scanner.next();
            String string = convertMorseToString(morseCode);
            System.out.println("String: " + string);
        } else {
            System.out.println("Invalid choice. Please try again.");
        }
    }

    private static String convertStringToMorse(String input) {
        StringBuilder morseCode = new StringBuilder();
        for (char c : input.toCharArray()) {
            for (int i = 0; i < LETTERS.length; i++) {
                if (String.valueOf(c).equals(LETTERS[i])) {
                    morseCode.append(MORSE_CODES[i]).append(" ");
                    break;
```

```
                }
            }
        }
        return morseCode.toString().trim();
    }

    private static String convertMorseToString(String morseCode) {
        StringBuilder string = new StringBuilder();
        String[] morseCodeArray = morseCode.split(" ");
        for (String code : morseCodeArray) {
            for (int i = 0; i < MORSE_CODES.length; i++) {
                if (code.equals(MORSE_CODES[i])) {
                    string.append(LETTERS[i]);
                    break;
                }
            }
        }
        return string.toString();
    }
}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java2.java } ; if ($?) { java java2 }
23DIT021
Enter 1 to convert string to Morse code, 2 to convert Morse code to string:
1
Enter a string to convert to Morse code:
krish
Morse code: -.- .-. .. ... ....
PS E:\Java>
```

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java2.java } ; if ($?) { java java2 }
23DIT021
Enter 1 to convert string to Morse code, 2 to convert Morse code to string:
2
Enter a Morse code to convert to string:
.-
String: A
PS E:\Java>
```

CONCLUSION :

From the above practical, I get to learn about the basic input commands pf how the program can take data from the user and print the required output.

PRACTICAL 3

AIM : A typical mobile number in India is “+91-AA-BBB-CCCCC”. Where the first two digits (AA)indicate a mobile system operator, the next three (BBB) denote the mobile switching code(MSC) while the remaining five digits (CCCCC) are unique to the subscriber. Write an application that takes a mobile number as an input from a user in above mentioned format and display code for mobile system operator, mobile switching code and last 5 digits which are unique to subscriber.

Ex. For an input +91-94-999-65789, output should be :Mobilesystem operator code is 94 MSC is 999 Unique code is 65789

CODE:

```
import java.util.Scanner;

   public class java3 {
      public static void main(String[] args) {

         Scanner scanner = new Scanner(System.in);
         System.out.println("Enter an integer: ");

         long num = scanner.nextLong();
         System.out.println("your entered no is = "+num);

         long [] digits = new long [10];
         for (int i = 9; i >= 0; i--) {
            digits[i] = num % 10;
            num = num / 10;
         }
```

```
        System.out.println("System Operator Code is: ");
        printDigits(digits, 0, 2);
        System.out.println("MSC is: ");
        printDigits(digits, 2, 5);
        System.out.println("Unique Code is: ");
        printDigits(digits, 5, 10);
        System.out.println("23DIT021");
    }

    private static void printDigits(long[] digits, int start, int end) {
        for (int i = start; i < end; i++) {
            System.out.print(digits[i]);
        }
        System.out.println();
    }

}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java3.java } ; if ($?) { java java3 }
Enter an integer:
1234567890
your entered no is = 1234567890
System Operator Code is:
12
MSC is:
345
Unique Code is:
67890
23DIT021
PS E:\Java>
```

CONCLUSION:

In this practical, I worked with the in-built functions of string like substring which divides a string to our desired length.

PRACTICAL 4

AIM : An electric appliance shop assigns code 1 to motor,2 to fan,3 to tube and 4 for wires. All other items have code 5 or more. While selling the goods, a sales tax of 8% to motor,12% to fan,5% to tube light,7.5% to wires and 3% for all other items is charged. A list containing the product code and price in two different arrays. Write a java program using switch statement to prepare the bill.

CODE :

```
import java.util.Scanner;

public class java4 {
   public static void main(String[] args) {
      System.out.println("23DIT021");

      String[] pdl = { " Motor ", " Fan ", " Tube ", " Wire ", " Others " };
      double[] price = { 1000, 500, 200, 100, 300 };
      double[] tax = { 8, 12, 5, (float) 7.5, 3 };

    double T,T1,T2,T3,T4,T5;
    T=T1=T2=T3=T4=T5=0;
      Scanner obj = new Scanner(System.in);
      int choice;

      do {
         System.out.println("\nEnter the code number For the products");
         System.out.println("1. Motor");
         System.out.println("2. Fan");
         System.out.println("3. Tube");
```

```
        System.out.println("4. Wire");
        System.out.println("5. Others");
        System.out.println("6. Exit");
        choice = obj.nextInt();

        switch (choice) {
            case 1:
                T1 = price[0] + (0.01 * tax[0]);

                break;
            case 2:
                T2 = price[1] + (0.01 * tax[1]);
                break;
            case 3:
                T3 = price[2] + (0.01 * tax[2]);
                break;
            case 4:
                T4 = price[3] + (0.01 * tax[3]);
                break;
            case 5:
                T5 = price[4] + (0.01 * tax[4]);

        }

    } while (choice != 6);
    System.out.println("-------------BILL---------------");
    System.out.println("------------------------------------------------");
    System.out.println("Product Name" + "\t" + "Price" + "\t");
    System.out.println("------------------------------------------------");
    if (T1>0){System.out.println("Motor" + "\t\t" + T1);}
    if (T2>0){System.out.println("Fan" + "\t\t" + T2);}
```

```
        if (T3>0){System.out.println("Tube" + "\t\t" + T3);}
        if (T4>0){System.out.println("Wire" + "\t\t" + T4);}
        if (T5>0){System.out.println("Others" + "\t\t" + T5);}
        System.out.println("-------------------------------------------------");
        T = T1 + T2 + T3 + T4 + T5;

        System.out.println("\nTotal Bill =   " + T);

    }

}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java4.java } ; if ($?) { java java4 }
23DIT021

Enter the code number For the products
1. Motor
2. Fan
3. Tube
4. Wire
5. Others
6. Exit
1

Enter the code number For the products
1. Motor
2. Fan
3. Tube
4. Wire
5. Others
6. Exit
3

Enter the code number For the products
1. Motor
2. Fan
3. Tube
4. Wire
5. Others
6. Exit
5

Enter the code number For the products
1. Motor
2. Fan
3. Tube
4. Wire
5. Others
6. Exit
1
```

```
Enter the code number For the products
1. Motor
2. Fan
3. Tube
4. Wire
5. Others
6. Exit
6
-------------BILL---------------
-----------------------------------------------------
Product Name    Price
-----------------------------------------------------
Motor           1000.08
Tube            200.05
Others          300.03
-----------------------------------------------------

Total Bill =   1500.16
PS E:\Java>
```

CONCLUSION :

In this practical, I worked with loops and switch cases to create a bill of an electrical appliances company.

PRACTICAL 5

AIM : Create a Java program that simulates a guessing game,where the computer picks a random number between 1 and 100 and the user has to guess it. We can use the Scanner class to 1 get user input and a loop to allow multiple guesses.

CODE:

```
import java.util.Random;
import java.util.Scanner;

public class java5 {
    public static void main(String[] args) {
        System.out.println("23DIT021");

        Random y=new Random();
        int x=y.nextInt(100);
        Scanner obj= new Scanner(System.in);
        System.out.println(x);



        for(int i=0;i<6;i++)
        {
            int k=6-i;
            System.out.println("You have "+  k  +" Chances left ");
            System.out.println("Guess the number between 1 to 100");
            int g=obj.nextInt();
            int min=Math.abs(x-g);
            System.out.println(min);
```

```
        if(g==x){
            System.out.println("You won the game");
            break;
        }
        else if(min>30)
        {
            System.out.println("You are far away from the number");

        }
        else if(min<30)
        {
            System.out.println("You are near the number");
        }


    }


  }

}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java5.java } ; if ($?) { java java5 }
23DIT021
You have 6 Chances left
Guess the number between 1 to 100
52
You are near the number
You have 5 Chances left
Guess the number between 1 to 100
70
You are near the number
You have 4 Chances left
Guess the number between 1 to 100
45
You are near the number
You have 3 Chances left
Guess the number between 1 to 100
65
You are near the number
You have 2 Chances left
Guess the number between 1 to 100
20
You are far away from the number
You have 1 Chances left
Guess the number between 1 to 100
80
You are near the number
PS E:\Java>
```

CONCLUSION :

I’ve developed a game that guesses a number with help of else if ladder where I give 5 attempts to user to guess a the random number and see whether he’s close to it or not.

PRACTICAL 6

AIM : Imagine you're tasked with creating a function that takes astring and a number. The goal is to repeat the first few characters of the string a specified number of times. If the string is shorter than the specified length, you should repeat whatever characters are available. How would you approach this problem?(function)

CODE:

```
import java.util.Scanner;

public class java6 {
    public static void main(String[] args) {
        System.out.println("23DIT021");
        Scanner x=new Scanner(System.in);
        System.out.println("Enter the input you want to: ");
        String input=x.nextLine();
        int y=input.length();
        if(y>3)
        {

            for(int k=0;k<3;k++)
            {
                System.out.print(input.substring(0, 3));
            }
        }
        else{
            for(int k=0;k<3;k++)
            {
                System.out.print(input.substring(0, y));
```

```
        }
    }


  }

}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java6.java } ; if ($?) { java java6 }
23DIT021
Enter the input you want to:
ghji
ghjghjghj
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java6.java } ; if ($?) { java java6 }
23DIT021
Enter the input you want to:
ab
ababab
PS E:\Java>
```

CONCLUSION :

In this practical, I've performed some operations on string to get the print the string till the length the user wishes it to print.

PRACTICAL 7

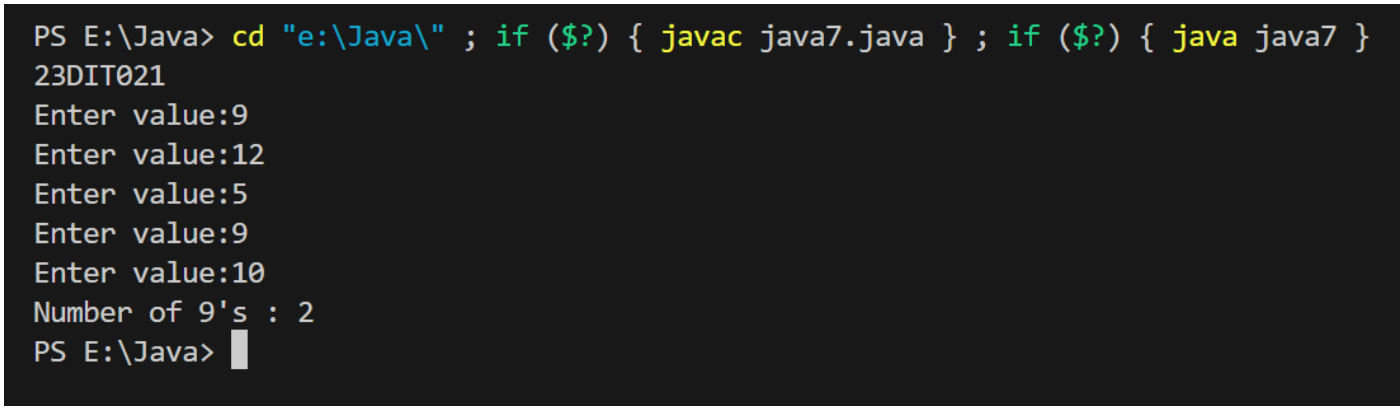
AIM : Imagine you're working with an array of integers, and your task is to count how many times the number 9 appears in the array. How would you write a Java program that efficiently determines this count, regardless of the array's size or the position of the numbers?

CODE:

```
import java.util.Scanner;

public class java7 {
    public static void main(String[] args) {
     System.out.println("23DIT021");
     Scanner x=new Scanner(System.in);

     //String a="1 2 3";
     int[] a=new int[5];
     for(int j=0;j<5;j++)
     {
       System.out.print("Enter value:");
       a[j]=x.nextInt();
     }
     int k=0;
     for(int j=0;j<5;j++)
     {

       if(a[j]==9)
       {
          k++;
       }
```

```
    }
    System.out.println("Number of 9's : "+k);



  }
}
```

OUTPUT :



CONCLUSION:

In this practical, I carried out comparison with elements of array given by th user and displayed the count of number 9 he/she has entered.

PRACTICAL 8

AIM : Suppose you are developing a text transformation tool. Your task is to create a function that takes a string and transforms it such that every character in the original string is doubled. For example, "The" becomes "TThhee". How would you design and implement this function in Java to handle any input string effectively?

CODE:

```
import java.util.Scanner;

public class java8 {

   public static void main(String[] args) {

      Scanner x=new Scanner(System.in);
      int n;

      System.out.println("Enter the String");
      String g=x.nextLine();
      Scanner no=new Scanner(System.in);
      System.out.println("Enter the number of times you wanna repeat a letter of string");
      n=no.nextInt();
      int y;
      y=g.length();
      System.out.println("The output is : ");
      for(int i=0;i<y;i++)
      {
         for(int k=0;k<n;k++){
            System.out.print(g.charAt(i));
         }
```

```
        }

    }

}
```

OUTPUT:

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java8.java } ; if ($?) { java java8 }
Enter the String
krish
Enter the number of times you wanna repeat a letter of string
4
The output is :
kkkkrrrriiiissssshhhh
PS E:\Java>
```

CONCLUSION :

I’ve transformed a string entered by user into a string that displays each character twice with the help of loops and concatenation.

PRACTICAL 9

AIM : you're a cybersecurity analyst investigating a suspicious string of characters. You need to analyze it thoroughly to uncover any hidden patterns or anomalies. The number of characters in the string to understand its size, Standardize the string for case-insensitive comparisons, Highlight potential keywords or acronyms, and Identify palindromes or potential encryption methods. Sort the string: Analyze character distribution and frequency.

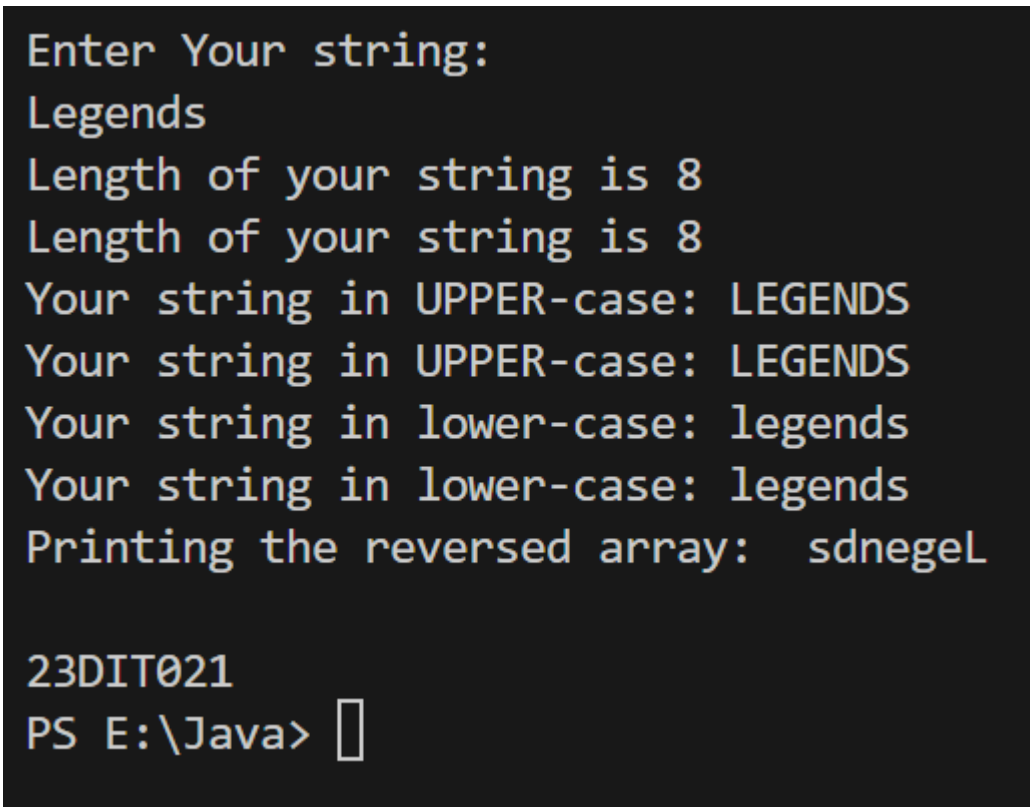
CODE:

```
import java.util.Scanner;

public class java9{

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.println("Enter Your string: ");
        String str = input.nextLine();
        System.out.println("Length of your string is " + str.length());
        int l = 0;
        try {
            for (int i = 0; str.charAt(i) != '\0'; i++) {
                l++;
            }
        } catch (StringIndexOutOfBoundsException e) {
            // TODO: handle exception
        }
```

```
        System.out.println("Length of your string is " + l);
        System.out.println("Your string in UPPER-case: " + str.toUpperCase());
        char[] array = str.toCharArray();
        for (int i = 0; i < array.length; i++) {
            if (array[i] >= 97 && array[i] <= 122) {
                array[i] = (char) (array[i] - 32);
            }
        }
        String upper = new String(array);
        System.out.println("Your string in UPPER-case: " + upper);
        System.out.println("Your string in lower-case: " + str.toLowerCase());
        char[] arr = str.toCharArray();
        for (int i = 0; i < arr.length; i++) {
            if (arr[i] >= 65 && arr[i] <= 90) {
                arr[i] = (char) (arr[i] + 32);
            }
        }
        String lower = new String(arr);
        System.out.println("Your string in lower-case: " + lower);
        String s = "";
        int n = str.length();
        for (int i = 0; i < n; i++) {
            s = s + str.charAt(n - 1 - i);
        }
        System.out.println("Printing the reversed array: " + s);
        System.out.println("\n23DIT021");
    }
```

}

OUTPUT :



CONCLUSION :

I've performed operatons of string like converting to lower case as well as upper case, found the length of the string and sorted the string as well with the help of bult-in functions and by the logic .

PRACTICAL 10

AIM : You're tasked with creating a basic encryption algorithm for your college project. The first step involves manipulating a given string, "CHARUSAT UNIVERSITY". Calculate the number of characters in the string to understand its structure, Identify the target character: The character to be replaced is 'H'. Replace the target character: Substitute 'H' with the first letter of your name. For instance, if your name starts with 'A', replace 'H' with 'A'. and Transform all characters to lowercase for consistency, and display the modified string.

CODE:

```
import java.util.Scanner;

public class java10 {
    public static void main(String[] args) {
        System.out.println("23DIT021");
        Scanner x=new Scanner(System.in);
        System.out.println("Enter the String: ");
        String y=x.nextLine();
        System.out.println("Length of the String is : "+ y.length());
        System.out.println("Lowercase String is : "+ y.toLowerCase());
        System.out.println("The String after replacing the H by K is : "+y.replace('H', 'K'));
    }
}
```

OUTPUT:

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java10.java } ; if ($?) { java java10 }
23DIT021
Enter the String:
CHARUSAT UNIVERSITY
Length of the String is : 19
Lowercase String is : charusat university
The String after replacing the H by K is : CKARUSAT UNIVERSITY
PS E:\Java>
```

CONCLUSION :

In this program, I've simply modified the string "CHARUSAT UNIVERSITY" and replaced the H with my initial and converted into lowercase.

PRACTICAL 11

AIM : You're a budding Java programmer working on a currency conversion application. Your initial task is to convert Pounds to Rupees. To practice different input methods, you decide to implement two approaches: command-line arguments and user input using the Scanner class.

CODE:

```
import java.util.Scanner;

public class java11 {
    public static void main(String[] args) {
        System.out.println("23DIT021");
        if (args.length > 0) {
            double pounds = Double.parseDouble(args[0]);
            double rupees = pounds * 100;
            System.out.println(pounds + " Pounds is equal to " + rupees + " Rupees");
        } else {
            Scanner scanner = new Scanner(System.in);
            System.out.println("Enter Pounds:");
            double pounds = scanner.nextDouble();
            double rupees = pounds * 100;
            System.out.println(pounds + " Pounds is equal to " + rupees + " Rupees");
        }
    }
}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java11.java } ; if ($?) { java java11 }
23DIT021
Enter Pounds:
69
69.0 Pounds is equal to 6900.0 Rupees
PS E:\Java>
```

CONCLUSION :

I’ve developed a program that converts pounds entered by the user into Indian currency.

PRACTICAL 12

AIM : Create a class called Employee that includes three pieces of information as instance variables—a first name (type String), a last name (type String), and a monthly salary (double). Your class should have a constructor that initializes the three instance variables. Provide a set and a get method for each instance variable. If the monthly salary is not positive, set it to 0.0. Write a test application named EmployeeTest that demonstrates class Employee's capabilities. Create two Employee objects and display each object's yearly salary. Then give each Employee a 10% raise and display each Employee's yearly salary again.

CODE:

```
import java.util.Scanner;
public class Employee {
   Scanner input = new Scanner(System.in);
   String name;
   String lastname;
   double msalary;
   Employee(String nam, String lnam, double salary)
   {
      name = nam;
      lastname =lnam;
      msalary = salary;
   }
   void set()
   {
      System.out.println("Enter Your first name: ");
      name = input.nextLine();
```

```
        System.out.println("Enter your last name: ");
        lastname = input.nextLine();
        System.out.println("Enter monthly salary: ");
        msalary =input.nextDouble();
    }
    void get()
    {
        System.out.println("First name: "+name+"\nLast name:
"+lastname+"\nMonthly Salary: "+msalary);
    }
    void salary()
    {
        double ysalary = msalary*12;
        ysalary = ysalary + ((10*ysalary)/100);
        System.out.println("The yearly salary is: "+ ysalary);
    }
    public static void main(String[] args) {
        Employee e1 = new Employee("Krish","Kamani",8000);
        Employee e2 = new Employee(null, null, 0);
        e1.get();
        e1.salary();
        e2.set();
        e2.get();
        e2.salary();
        System.out.println("\n23DIT021");
    }
}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac Employee.java } ; if ($?) { java Employee }
First name: Krish
Last name: Kamani
Monthly Salary: 8000.0
The yearly salary is: 105600.0
Enter Your first name:
Aryan
Enter your last name:
Sagani
Enter monthly salary:
5200
First name: Aryan
Last name: Sagani
Monthly Salary: 5200.0
The yearly salary is: 68640.0

23DIT021
PS E:\Java>
```

CONCLUSION :

I've developed a program that gets info about employees like his name and monthly salary and prints with yearly salary.

PRACTICAL 13

AIM : Create a class called Date that includes three pieces of information as instance variables—a month (type int), a day (type int) and a year (type int). Your class should have a constructor that initializes the three instance variables and assumes that the values provided are correct. Provide a set and a get method for each instance variable. Provide a method displayDate that displays the month, day and year separated by forward slashes (/). Write a test application named DateTest that demonstrates class Date's capabilities.

CODE:

```
import java.util.Scanner;
 class date{
    int year,day,month;
    Scanner input = new Scanner(System.in);
    date()
    {
      year =2024;
      day = 12;
      month = 3;
    }
    void setday()
    {
       System.out.println("Enter day: ");
       day = input.nextInt();
    }
    void setmonth()
    {       System.out.println("Enter month: ");
       month = input.nextInt();
```

```
    }
    void setyear()
    {
        System.out.println("Enter year: ");
        year = input.nextInt();
    }
    void getday()
    {
        System.out.println("Day: "+day );
    }
    void getmonth()
    {
        System.out.println("month: "+month );
    }
    void getyear()
    {
        System.out.println("year: "+year );
    }
    void DisplayDate()
    {
        System.out.println("Date: "+month+"/"+day+"/"+year);
    }
}
public class java13{
    public static void main(String[] args) {
        date d1=new date();
        d1.getday();
```

```
        d1.getmonth();
        d1.getyear();
        d1.DisplayDate();
        date d2=new date();
        d2.setday();
        d2.setmonth();
        d2.setyear();
        d2.getday();
        d2.getmonth();
        d2.getyear();
        d2.DisplayDate();
        System.out.println("\n23DIT021");    }
}
```

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac java13.java } ; if ($?) { java java13 }
Day: 12
month: 3
year: 2024
Date: 3/12/2024
Enter day:
14
Enter month:
4
Enter year:
2024
Day: 14
month: 4
year: 2024
Date: 4/14/2024

23DIT021
PS E:\Java>
```

CONCLUSION :

In this practical, I've created a class named date and taken the day, month, year from the user to display the date using it's objects.

PRACTICAL 14

AIM : Write a program to print the area of a rectangle by creatin a class named 'Area' taking the values of its length and breadth as parameters of its constructor and having a method named 'returnArea' which returns the area of the rectangle. Length and breadth of rectangle are entered through keyboard.

CODE:

```
import java.util.Scanner;
public class Area {
   float length,breadth;
   Area(float l,float b)
   {
      length=l;
      breadth=b;
   }
   float returnArea(float length,float breadth)
   {
      return length*breadth;
   }
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);
      System.out.println("Enter length of triangle: ");
      float l = input.nextFloat();
      System.out.println("Enter breadth of triangle: ");
      float b = input.nextFloat();
      Area a = new Area(l, b);
      float area = a.returnArea(l, b);
      System.out.println("The area of triangle is: "+area);
      System.out.println("23DIT021");
   }
```

}

OUTPUT :

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac Area.java } ; if ($?) { java Area }
Enter length of triangle:
14
Enter breadth of triangle:
12
The area of triangle is: 168.0
23DIT021
PS E:\Java>
```

CONCLSUION :

I’ve made a program to calculate the area of a rectangle by taking the prarameters like length and breadth from the user with the help of parameterized constructor.

PRACTICAL 15

AIM : Imagine you're building a scientific calculator application. One crucial feature is handling complex numbers. You decide to create a Complex class to represent complex numbers and perform operations on them.(sum, difference and product)

CODE:

```
import java.util.Scanner;
public class Complex {
   int img,real;
   Complex() {}
   Complex(int r,int i)
   {
      img =i;
      real =r; }
   void returnSum(Complex c1,Complex c2)
   {       int R = c1.real+ c2.real;
      int I = c1.img+c2.img;
      System.out.println("Sum of given two numbers is: ");
      Print(R, I);
   }
   void returnDiff(Complex c1,Complex c2)
   {
      int R = c1.real-c2.real;
      int I = c1.img-c2.img;
      System.out.println("Difference of given two numbers is: ");
      Print(R, I);
   }
```

```
    void returnPro(Complex c1,Complex c2)
    {       int r = (c1.real*c2.real)-(c1.img*c2.img);
        int i = (c1.real*c2.img)+(c1.img*c2.real);
        System.out.println("Product of given two numbers is: ");
        Print(r, i);
    }
    void Print(int r, int i)
    {     if (i<0) {
            System.out.println(r+" - "+Math.abs(i)+"i");
        }
        else{           System.out.println(r+" + "+i+"i");
        }
    }
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int r1,i1;
        System.out.println("Enter real part of first complex number: ");
        r1 = input.nextInt();
        System.out.println("Enter the imaginary part of first complex number: ");
        i1 =input.nextInt();
        Complex c1 = new Complex(r1,i1);
        System.out.println("Enter real part of second complex number: ");
        r1 = input.nextInt();
        System.out.println("Enter the imaginary part of second complex number:
");
        i1 =input.nextInt();
        Complex c2 = new Complex(r1, i1);
```

```
        Complex c3 = new Complex();
        c3.returnSum(c1, c2);
        c3.returnDiff(c1, c2);
        c3.returnPro(c1, c2);
        System.out.println("23DIT021");
    }
}
```

OUTPUT:

```
PS E:\Java> cd "e:\Java\" ; if ($?) { javac Complex.java } ; if ($?) { java Complex }
Enter real part of first complex number:
4
Enter the imaginary part of first complex number:
5
Enter real part of second complex number:
-9
Enter the imaginary part of second complex number:
3
Sum of given two numbers is:
-5 + 8i
Difference of given two numbers is:
13 + 2i
Product of given two numbers is:
-51 - 33i
23DIT021
PS E:\Java>
```

CONCLUSION:

In this practical, I've made an interface that carries out operations like sum, difference and product between two complex numbers given by the user. I've also used the concept of objects as function arguments and built-in functions of maths like Math.abs() to get the absolute value of a number.