

SCE SUBMISSION

Object Oriented Programming

[PATTERN 2020]

Second Year Bachelor Of Technology

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Course Teacher

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VI

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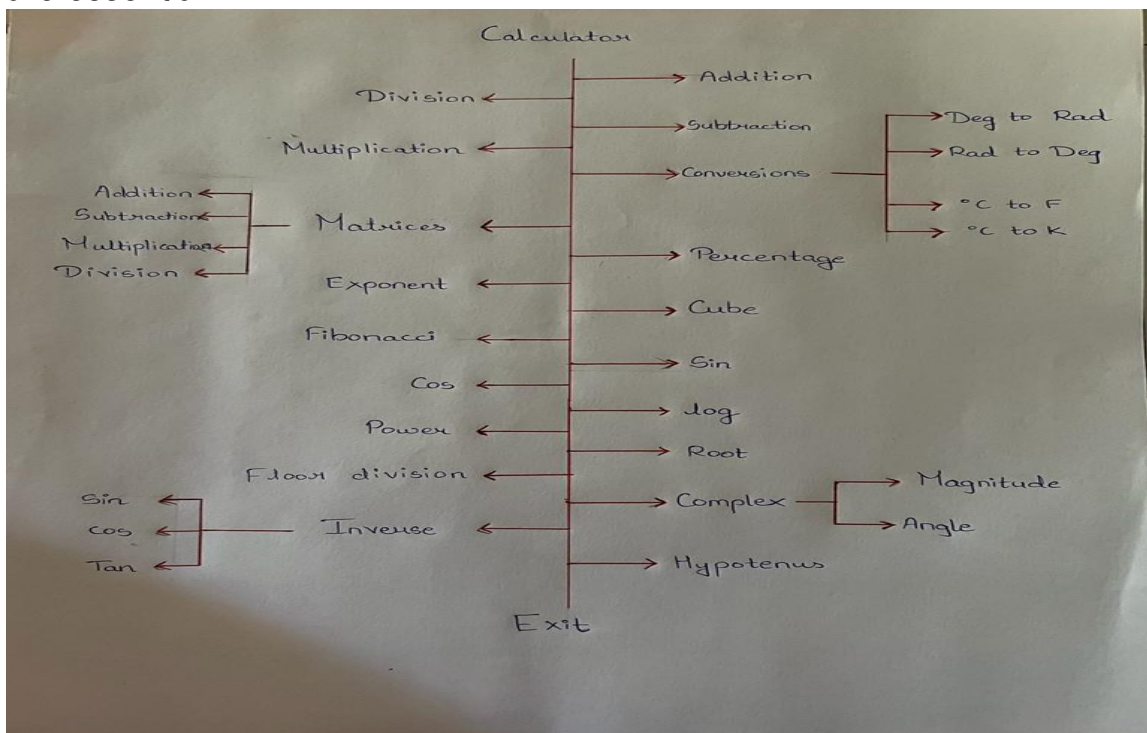
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1). Topic Discussion

SCIENTIFIC CALCULATOR

- 1) A scientific calculator is a type of calculator designed to perform complex mathematical, engineering, and scientific calculations.
- 2) Scientific calculators typically have a larger number of functions and features compared to basic calculators, including trigonometric functions, logarithms, and statistical analysis.
- 3). Many scientific calculators also have the ability to perform matrix calculations, solve equations, and convert between different units of measurement.
- 4). Some scientific calculators have additional features such as graphing capabilities, programming functionality, and communication with other devices such as computers or printers.
- 5). Scientific calculators are widely used in fields such as engineering, physics, mathematics, and finance where accurate and efficient calculations are essential.



2). Solved Problem

Benefits over normal calculator:

- **24-25 function affiliates**
- **Messy Interface(shift)**
- **Matrix easy**
- **Complex easy**



Swing (Eclipse)

3). Implementation of code with result

```
import java.awt.EventQueue;

import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import javax.swing.SpringLayout;
import java.awt.Window.Type;
import java.awt.Color;
import javax.swing.JButton;
import java.awt.event.ActionListener;
import java.util.Scanner;
import java.awt.event.ActionEvent;
import java.awt.Font;
import java.awt.SystemColor;
import javax.swing.UIManager;
import javax.swing.ImageIcon;

public class pbl extends JFrame {

    private JPanel contentPane;

    /**
     * Launch the application.
     */
    public static void main(String[] args) {
        EventQueue.invokeLater(new Runnable() {
            public void run() {
                try {
                    pbl frame = new pbl();
                    frame.setVisible(true);
                } catch (Exception e) {
                    e.printStackTrace();
                }
            }
        });
    }

    /**
     * Create the frame.
     */
    public pbl() {
        setBackground(Color.CYAN);
        setTitle("Scientific calculator");
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setBounds(100, 100, 926, 688);
        contentPane = new JPanel();
        contentPane.setBackground(new Color(0, 255, 255));
        contentPane.setForeground(new Color(0, 255, 255));
        contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));

        setContentPane(contentPane);
        SpringLayout sl_contentPane = new SpringLayout();
        contentPane.setLayout(sl_contentPane);

        JButton btnNewButton = new JButton("Add");
        sl_contentPane.putConstraint(SpringLayout.NORTH, btnNewButton, 27, SpringLayout.NORTH, contentPane);
        sl_contentPane.putConstraint(SpringLayout.WEST, btnNewButton, 10, SpringLayout.WEST, contentPane);
        sl_contentPane.putConstraint(SpringLayout.SOUTH, btnNewButton, 75, SpringLayout.NORTH, contentPane);
        btnNewButton.setIcon(null);
        btnNewButton.setForeground(Color.MAGENTA);
        btnNewButton.setBackground(Color.ORANGE);
        btnNewButton.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
```

```

        Scanner sc=new Scanner(System.in);
        System.out.println("Enter First  number ");
        int x=sc.nextInt();
        System.out.println("Enter Second  number ");
        int y=sc.nextInt();
        System.out.println(x+y);
    }
});
contentPane.add(btnNewButton);

JButton btnDiv = new JButton("Div");
sl_contentPane.putConstraint(SpringLayout.NORTH, btnDiv, 0, SpringLayout.NORTH, btnNewButton);
sl_contentPane.putConstraint(SpringLayout.WEST, btnDiv, 43, SpringLayout.EAST, btnNewButton);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnDiv, 48, SpringLayout.NORTH, btnNewButton);
btnDiv.setForeground(Color.RED);
btnDiv.setFont(new Font("Kohinoor Devanagari", Font.PLAIN, 13));
btnDiv.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter First  number ");
        int x=sc.nextInt();
        System.out.println("Enter Second  number ");
        int y=sc.nextInt();
        System.out.println(x/y);
    }
});
btnDiv.setBackground(Color.BLACK);
contentPane.add(btnDiv);

JButton btnSub = new JButton("Sub");
sl_contentPane.putConstraint(SpringLayout.WEST, btnSub, 342, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnDiv, -68, SpringLayout.WEST, btnSub);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnSub, 1, SpringLayout.NORTH, btnNewButton);
btnSub.setForeground(Color.BLUE);
btnSub.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter First  number ");
        int x=sc.nextInt();
        System.out.println("Enter Second  number ");
        int y=sc.nextInt();
        System.out.println(x-y);
    }
});
btnSub.setFont(new Font("Kohinoor Devanagari", Font.PLAIN, 13));
btnSub.setBackground(Color.YELLOW);
contentPane.add(btnSub);

JButton btnMul = new JButton("Mul");
sl_contentPane.putConstraint(SpringLayout.WEST, btnMul, 539, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnSub, -74, SpringLayout.WEST, btnMul);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnMul, 9, SpringLayout.NORTH, btnNewButton);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnMul, 48, SpringLayout.NORTH, btnNewButton);
btnMul.setForeground(Color.RED);
btnMul.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter First  number ");
        int x=sc.nextInt();
        System.out.println("Enter Second  number ");
        int y=sc.nextInt();
        System.out.println(x*y);
    }
});
btnMul.setFont(new Font("Kohinoor Devanagari", Font.PLAIN, 13));
btnMul.setBackground(Color.GRAY);
contentPane.add(btnMul);

JButton btnConversions = new JButton("Conversions");
sl_contentPane.putConstraint(SpringLayout.EAST, btnMul, -73, SpringLayout.WEST, btnConversions);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnConversions, -4, SpringLayout.NORTH, btnMul);
sl_contentPane.putConstraint(SpringLayout.WEST, btnConversions, -180, SpringLayout.EAST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnConversions, -46, SpringLayout.EAST, contentPane);

```

```

        btnConversions.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter which conversion you want to perform ");
                System.out.println("Enter 1 for degree to radians , 2 for radians to degrees ,3 for celcius to farheniet ,4 for
celcuis to kelvin");

                int g=sc.nextInt();
                if(g==1) {
                    System.out.println("Enter the value in degrees");
                    int t=sc.nextInt();
                    System.out.println("Your valur in radians is "+ Math.toRadians(t));
                }
                else if(g==2){
                    System.out.println("Enter the value in radians");
                    int t=sc.nextInt();
                    System.out.println("Y our valur in radians is "+ Math.toDegrees(t));
                }
                else if(g==3) {
                    System.out.println("Enter the values in celcius");
                    int h=sc.nextInt();
                    double j=((9/5)*h)+32;
                    System.out.println("The value in farheniet is" + j);
                }
                else if(g==4) {
                    System.out.println("Enter the values in celcius");
                    int h=sc.nextInt();
                    double j=h+273;
                    System.out.println("The value in kelvin is" + j);
                }
            }
        });
        btnConversions.setForeground(Color.MAGENTA);
        btnConversions.setFont(new Font("Kohinoor Devanagari", Font.PLAIN, 13));
        btnConversions.setBackground(new Color(34, 139, 34));
        contentPane.add(btnConversions);

        JButton btnMatrices = new JButton("Matrices");
        sl_contentPane.putConstraint(SpringLayout.NORTH, btnMatrices, 55, SpringLayout.SOUTH, btnNewButton);
        sl_contentPane.putConstraint(SpringLayout.SOUTH, btnMatrices, -471, SpringLayout.SOUTH, contentPane);
        sl_contentPane.putConstraint(SpringLayout.EAST, btnMatrices, -812, SpringLayout.EAST, contentPane);
        sl_contentPane.putConstraint(SpringLayout.EAST, btnNewButton, 0, SpringLayout.EAST, btnMatrices);
        btnMatrices.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                Scanner s=new Scanner(System.in);
                System.out.println("Enter first index of array (m terms)");
                int h=s.nextInt();
                System.out.println("Enter second index of array (n terms)");
                int k=s.nextInt();
                int a[][]=new int[h][k];
                int b[][]=new int[h][k];
                int c[][]=new int[h][k];
                Scanner sc=new Scanner(System.in);
                for(int i=0;i<h;i++) {
                    for(int j=0;j<k;j++) {
                        System.out.println("Enter the elements of matrices");
                        a[i][j]=sc.nextInt();
                    }
                }
                for(int i=0;i<h;i++) {
                    for(int j=0;j<k;j++) {
                        System.out.println("Enter the elements of matrices");
                        b[i][j]=sc.nextInt();
                    }
                }
                System.out.println("Enter which operation do you want to perform on matrices (Enter 1 for addition,2 for
Substraction,3 for division,4 for multiplication)");
                int g=sc.nextInt();

```



```

        if(g==1) {
            for(int i=0;i<h;i++) {
                for(int j=0;j<k;j++) {
                    System.out.println("Addition of elements is ");
                    System.out.println(a[i][j]+b[i][j]);
                }
            }
        }
        else if(g==2) { for(int i=0;i<h;i++) {
            for(int j=0;j<k;j++) {
                System.out.println("Subtraction of elements is ");
                System.out.println(a[i][j]-b[i][j]);
            }
        }
    }

    else if(g==3) { for(int i=0;i<h;i++) {
        for(int j=0;j<k;j++) {
            System.out.println("Division of elements is ");
            System.out.println(a[i][j]/b[i][j]);
        }
    }
    }

    else if(g==4) { for(int i=0;i<h;i++) {
        for(int j=0;j<k;j++) {
            System.out.println("Multiplication of elements is ");
            System.out.println(a[i][j]*b[i][j]);
        }
    }
    }

}

    }

});
btnMatrices.setForeground(SystemColor.controlHighlight);
btnMatrices.setBackground(new Color(205, 133, 63));
contentPane.add(btnMatrices);

JButton btnPercentage = new JButton("Percentage");
sl_contentPane.putConstraint(SpringLayout.WEST, btnPercentage, 147, SpringLayout.WEST, contentPane);
btnPercentage.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter total no of marks ");
        int d=sc.nextInt();
        System.out.println("Enter no of marks u obtained ");
        int k=sc.nextInt();
        double perc=((k*100)/d);
        System.out.println("Congratulations you have obtained" +perc+ "Percentage");
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPercentage, 0, SpringLayout.NORTH, btnMatrices);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPercentage, 0, SpringLayout.SOUTH, btnMatrices);
sl_contentPane.putConstraint(SpringLayout.EAST, btnPercentage, 170, SpringLayout.EAST, btnMatrices);
btnPercentage.setForeground(Color.RED);
btnPercentage.setBackground(new Color(255, 160, 122));
contentPane.add(btnPercentage);

JButton btnPercentage_1 = new JButton("Exponent");
sl_contentPane.putConstraint(SpringLayout.WEST, btnPercentage_1, 68, SpringLayout.EAST, btnPercentage);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnSub, -53, SpringLayout.NORTH, btnPercentage_1);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPercentage_1, 0, SpringLayout.SOUTH, btnMatrices);
btnPercentage_1.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {

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        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number whose exponent is to be calculated ");
        double x=sc.nextInt();
        System.out.println(Math.exp(x));

    }

});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPercentage_1, 0, SpringLayout.NORTH, btnMatrices);
btnPercentage_1.setForeground(Color.BLUE);
btnPercentage_1.setBackground(new Color(138, 43, 226));
contentPane.add(btnPercentage_1);

JButton btnPercentage_1_1 = new JButton("Cube");
sl_contentPane.putConstraint(SpringLayout.WEST, btnPercentage_1_1, 539, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnPercentage_1, -69, SpringLayout.WEST, btnPercentage_1_1);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPercentage_1_1, -48, SpringLayout.SOUTH, btnMatrices);
btnPercentage_1_1.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Base number");
        double d=sc.nextInt();
        double v=3.0;
        System.out.println(Math.pow(d,v));
    }
});
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPercentage_1_1, 0, SpringLayout.SOUTH, btnMatrices);
btnPercentage_1_1.setForeground(Color.ORANGE);
btnPercentage_1_1.setBackground(new Color(0, 0, 255));
contentPane.add(btnPercentage_1_1);

JButton btnPercentage_1_1_1 = new JButton("Square");
sl_contentPane.putConstraint(SpringLayout.WEST, btnPercentage_1_1_1, 760, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnPercentage_1_1_1, -37, SpringLayout.EAST, contentPane);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnConversions, -52, SpringLayout.NORTH,
btnPercentage_1_1_1);
sl_contentPane.putConstraint(SpringLayout.EAST, btnPercentage_1_1, -97, SpringLayout.WEST,
btnPercentage_1_1_1);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPercentage_1_1_1, -48, SpringLayout.SOUTH,
btnMatrices);
btnPercentage_1_1_1.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Base number");
        double d=sc.nextInt();
        double v=2.0;
        System.out.println(Math.pow(d,v));
    }
});
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPercentage_1_1_1, 0, SpringLayout.SOUTH, btnMatrices);
btnPercentage_1_1_1.setForeground(Color.MAGENTA);
btnPercentage_1_1_1.setBackground(new Color(211, 211, 211));
contentPane.add(btnPercentage_1_1_1);

JButton btnFactorial = new JButton("Factorial");
sl_contentPane.putConstraint(SpringLayout.NORTH, btnFactorial, 263, SpringLayout.NORTH, contentPane);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnFactorial, 132, SpringLayout.SOUTH, btnMatrices);
btnFactorial.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        int i,fact=1;
        System.out.println("Enter the no which factorial is to be calculated ");
        int no=sc.nextInt();
        for(i=1;i<=no;i++){
            fact=fact*i;
        }
        System.out.println("Factorial of "+no+" is: "+fact);
    }
});
sl_contentPane.putConstraint(SpringLayout.WEST, btnFactorial, 0, SpringLayout.WEST, btnMatrices);
btnFactorial.setForeground(UIManager.getColor("Button.select"));
btnFactorial.setBackground(new Color(240, 230, 140));
contentPane.add(btnFactorial);

```

```

JButton btnFibonacci = new JButton("Fibonacci");
sl_contentPane.putConstraint(SpringLayout.WEST, btnFibonacci, 55, SpringLayout.EAST, btnFactorial);
btnFibonacci.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter n terms upto which fibonacci is been calculated ");
        int n = sc.nextInt(), firstTerm = 0, secondTerm = 1;
        System.out.println("Fibonacci Series till " + n + " terms:");
        for (int i = 1; i <= n; ++i) {
            System.out.println(firstTerm + " , ");
            int nextTerm = firstTerm + secondTerm;
            firstTerm = secondTerm;
            secondTerm = nextTerm;
        }
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnFibonacci, -48, SpringLayout.SOUTH, btnFactorial);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnFibonacci, 0, SpringLayout.SOUTH, btnFactorial);
btnFibonacci.setForeground(new Color(255, 20, 147));
btnFibonacci.setBackground(new Color(224, 255, 255));
contentPane.add(btnFibonacci);

JButton btnSin = new JButton("Sin");
sl_contentPane.putConstraint(SpringLayout.WEST, btnSin, 342, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnFibonacci, -69, SpringLayout.WEST, btnSin);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnSin, 0, SpringLayout.NORTH, btnFactorial);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnSin, 0, SpringLayout.SOUTH, btnFactorial);
btnSin.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Decimal number whose sine value is to be calculated ");
        double d=sc.nextInt();
        System.out.println(Math.sin(d));
    }
});
btnSin.setForeground(new Color(255, 140, 0));
btnSin.setBackground(new Color(0, 255, 0));
contentPane.add(btnSin);

JButton btnCos = new JButton("Cos");
sl_contentPane.putConstraint(SpringLayout.WEST, btnCos, 550, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnSin, -89, SpringLayout.WEST, btnCos);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnCos, 0, SpringLayout.NORTH, btnFactorial);
btnCos.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Decimal number whose cos value is to be calculated ");
        double d=sc.nextInt();
        System.out.println(Math.cos(d));
    }
});
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnCos, 0, SpringLayout.SOUTH, btnFactorial);
btnCos.setForeground(new Color(0, 0, 255));
btnCos.setBackground(new Color(255, 0, 0));
contentPane.add(btnCos);

JButton btnTan = new JButton("LOG");
sl_contentPane.putConstraint(SpringLayout.EAST, btnCos, -114, SpringLayout.WEST, btnTan);
sl_contentPane.putConstraint(SpringLayout.WEST, btnTan, -139, SpringLayout.EAST, contentPane);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnTan, 0, SpringLayout.SOUTH, btnFactorial);
btnTan.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Decimal number whose LOG is to be calculated ");
        double d=sc.nextInt();
        System.out.println(Math.log(d));
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnTan, 0, SpringLayout.NORTH, btnFactorial);
sl_contentPane.putConstraint(SpringLayout.EAST, btnTan, -51, SpringLayout.EAST, contentPane);
btnTan.setForeground(new Color(0, 128, 128));
btnTan.setBackground(new Color(240, 248, 255));
contentPane.add(btnTan);

```

```

JButton btnPower = new JButton("POWER");
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPower, 120, SpringLayout.SOUTH, btnFactorial);
sl_contentPane.putConstraint(SpringLayout.EAST, btnPower, -812, SpringLayout.EAST, contentPane);
btnPower.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Base number");
        double d=sc.nextInt();
        System.out.println("Enter Exponent number");
        double v=sc.nextInt();
        System.out.println(Math.pow(d,v));
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPower, 72, SpringLayout.SOUTH, btnFactorial);
btnPower.setForeground(new Color(255, 99, 71));
btnPower.setBackground(Color.PINK);
contentPane.add(btnPower);

JButton btnRoot = new JButton("Root");
sl_contentPane.putConstraint(SpringLayout.WEST, btnRoot, 169, SpringLayout.WEST, contentPane);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnRoot, 0, SpringLayout.SOUTH, btnPower);
sl_contentPane.putConstraint(SpringLayout.EAST, btnRoot, 159, SpringLayout.EAST, btnPower);
btnRoot.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Decimal number whose root is to be calculated ");
        double d=sc.nextInt();
        System.out.println(Math.sqrt(d));
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnRoot, 0, SpringLayout.NORTH, btnPower);
btnRoot.setForeground(new Color(255, 160, 122));
btnRoot.setBackground(Color.PINK);
contentPane.add(btnRoot);

JButton btnPower_2 = new JButton("Floord");
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPower_2, 0, SpringLayout.NORTH, btnPower);
sl_contentPane.putConstraint(SpringLayout.WEST, btnPower_2, 79, SpringLayout.EAST, btnRoot);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPower_2, 0, SpringLayout.SOUTH, btnPower);
btnPower_2.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter First number ");
        double x=sc.nextInt();
        System.out.println("Enter Second number ");
        double y=sc.nextInt();
        System.out.println((x/y));
    }
});
btnPower_2.setForeground(new Color(128, 0, 0));
btnPower_2.setBackground(Color.PINK);
contentPane.add(btnPower_2);

JButton btnPower_3 = new JButton("Complex");
sl_contentPane.putConstraint(SpringLayout.EAST, btnPower_2, -82, SpringLayout.WEST, btnPower_3);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPower_3, 0, SpringLayout.NORTH, btnPower);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPower_3, 0, SpringLayout.SOUTH, btnPower);
btnPower_3.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter Real part of complex number ");
        int h=sc.nextInt();
        System.out.println("Enter imaginary part of complex number ");
        int j=sc.nextInt();
        System.out.println("Your complex number is "+ h + "+" + "i" +j);
        System.out.println("Enter 1 to calculate the Magnitude of complex number , 2 to calculate the angle ");
        int c=sc.nextInt();
        if(c==1) {
            System.out.println("The magnitude of complex number is " + Math.hypot(h, j));
        }
    }
});

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        else if(c==2) {
            System.out.println("The angle of complex number is " + Math.atan2(j, h));
        }
    }

});
btnPower_3.setForeground(new Color(255, 165, 0));
btnPower_3.setBackground(new Color(128, 128, 0));
contentPane.add(btnPower_3);

JButton btnPower_4 = new JButton("Inverses");
sl_contentPane.putConstraint(SpringLayout.EAST, btnPower_3, -114, SpringLayout.WEST, btnPower_4);
sl_contentPane.putConstraint(SpringLayout.NORTH, btnPower_4, 0, SpringLayout.NORTH, btnPower);
sl_contentPane.putConstraint(SpringLayout.WEST, btnPower_4, 0, SpringLayout.WEST, btnTan);
sl_contentPane.putConstraint(SpringLayout.EAST, btnPower_4, 96, SpringLayout.WEST, btnTan);
btnPower_4.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the no whose inverse is to be calculated ");
        System.out.println("Enter 1 for sin inverse ,2 for cos inverse,3 for tan inverse ");
        int h=sc.nextInt();
        System.out.println("Enter the value");
        double j=sc.nextInt();
        if(h==1) {
            System.out.println("Sine inverse of following number is " + Math.asin(j));
        }
        else if(h==2) {
            System.out.println("cos inverse of following number is " + Math.acos(j));
        }
        else if(h==3) {
            System.out.println("tan inverse of following number is " + Math.atan(j));
        }
    }
});
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnPower_4, 0, SpringLayout.SOUTH, btnPower);
btnPower_4.setForeground(new Color(255, 99, 71));
btnPower_4.setBackground(Color.PINK);
contentPane.add(btnPower_4);

JButton btnHypotenuse = new JButton("Hypotenuse");
btnHypotenuse.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the values ");
        int x=sc.nextInt();
        int y=sc.nextInt();
        System.out.println(Math.hypot(x, y));
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnHypotenuse, 43, SpringLayout.SOUTH, btnRoot);
sl_contentPane.putConstraint(SpringLayout.WEST, btnHypotenuse, 0, SpringLayout.WEST, btnRoot);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnHypotenuse, -128, SpringLayout.SOUTH, contentPane);
sl_contentPane.putConstraint(SpringLayout.EAST, btnHypotenuse, 390, SpringLayout.WEST, contentPane);
btnHypotenuse.setForeground(new Color(255, 0, 255));
btnHypotenuse.setBackground(Color.PINK);
contentPane.add(btnHypotenuse);

JButton btnExit = new JButton("EXIT");
btnExit.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        System.exit(0);
    }
});
sl_contentPane.putConstraint(SpringLayout.NORTH, btnExit, 40, SpringLayout.SOUTH, btnPower_3);
sl_contentPane.putConstraint(SpringLayout.WEST, btnExit, 140, SpringLayout.EAST, btnHypotenuse);
sl_contentPane.putConstraint(SpringLayout.SOUTH, btnExit, 88, SpringLayout.SOUTH, btnPower_3);
sl_contentPane.putConstraint(SpringLayout.EAST, btnExit, 325, SpringLayout.EAST, btnHypotenuse);
btnExit.setForeground(new Color(127, 255, 212));
btnExit.setBackground(Color.PINK);
contentPane.add(btnExit);
}
}

```

Project Explorer Console X Calculator.java pbl.java thr.java

pbl [Java Application] /Applications/Eclipse.app/Contents/Eclipse/plugins/org.eclipse.justj.openjdk.hotspot.jre.full.macosx.x86_64_17.0.4.v20220903-1038/jre

Enter First number
21

Enter Second number
26

0.8076923076923077

Enter Real part of complex number
4

Enter imaginary part of complex number
5

Your complex number is 4+i5

Enter 1 to calculate the Magnitude of complex number , 2 to calculate the angle
1

The magnitude of complex number is 6.4031242374328485

Enter which coversion you want to perform

Enter 1 for degree to radians , 2 for radians to degrees ,3 for celcius to farheniet ,4 for celcuis to kelvin
3

Enter the values in celcius
45

The value in farheniet is77.0

Enter n terms upto which fibonacci is been calculated
4

Fibonacci Series till 4 terms:
0,
1,
1,
2,

Enter the no which factorial is to be calculated
3

Factorial of 3 is: 6

Enter the number whose exponent is to be calculated
2

7.38905609893065

Enter Base number
2

Enter Exponent number
2

4.0

Enter Decimal number whose root is to be calculated
22

4.69041575982343

Enter Decimal number whose LOG is to be calculated
8

2.0794415416798357

4). Data structure/ OOP concept analysis:

Concepts used in program:

- 1.Functions
- 2.GUI
- 3.Objects (Terminal based program)
- 4.Switch-Case
- 5.Do-while loop, for loop
- 6.If-else if ladder
- 7.Nested Loops

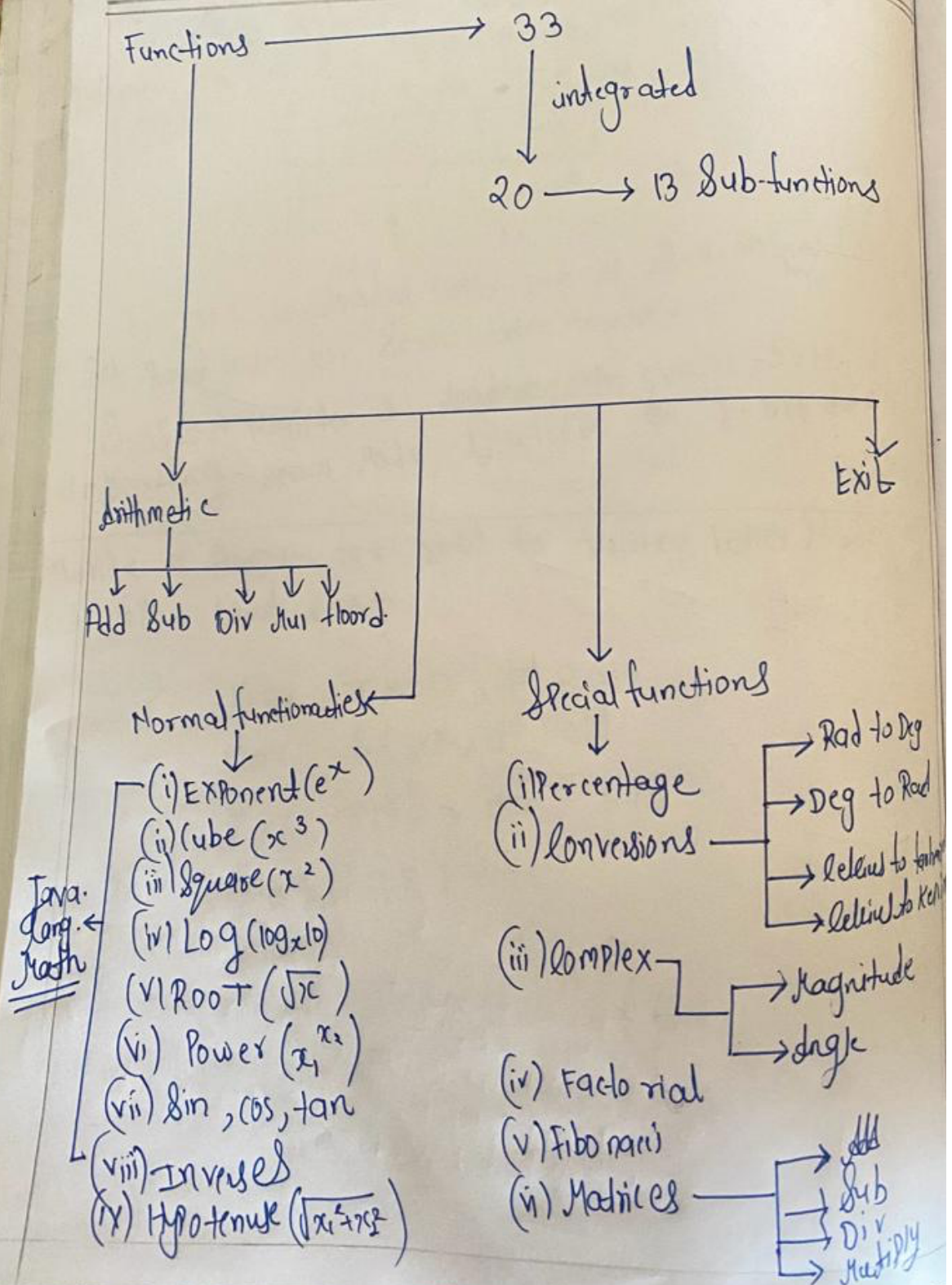
Prints

—————> Interface

—————> Multithreading

—————> Printing

Project Palmel



4). Applications and Conclusion:

Scientific calculators are electronic devices that can perform mathematical operations and calculations beyond the capabilities of a standard calculator. They are commonly used in various fields, including engineering, mathematics, physics, chemistry, and finance, among others. Here are some applications and conclusions of scientific calculators:

Applications:

1. **Complex calculations:** Scientific calculators are designed to handle complex calculations such as trigonometric functions, logarithms, exponents, and roots.
2. **Statistical analysis:** These calculators can perform statistical analysis, including calculating mean, median, mode, standard deviation, variance, and regression analysis.
3. **Conversion:** They can convert between different units of measurement, including length, area, volume, mass, temperature, and currency.
4. **Graphing:** Some scientific calculators come with built-in graphing capabilities, allowing users to create and manipulate graphs of mathematical functions and equations.
5. **Programming:** Many scientific calculators have the ability to write and execute programs, which can be used for repetitive calculations and data analysis.

In conclusion, scientific calculators are versatile devices that can be used in many applications, ranging from complex mathematical calculations to statistical analysis, unit conversion, graphing, and programming. Their accuracy, speed, productivity, and convenience make them essential tools in many fields of study and work.