1. Design a standard calculator using Swing components that supports basic operations

(Addition, Subtraction, Multiplication, and Division). Implement this with Intellij IDEA

Implementation Guidelines:

○ Use JTextField to display input/output.

○ Use JButton for digits (0-9) and operations ( +, -, *,  /, =, %, square, square-root,

cube, C, etc. ).

○ Implement event handling for button clicks.

○ Display results in the text field.

```java
import javax.swing.*;

import java.awt.*;

import java.awt.event.*;

public class Calculator extends JFrame implements ActionListener {

    JTextField display;

    JButton[] numButtons = new JButton[10];

    JButton addBtn, subBtn, mulBtn, divBtn, eqBtn, clrBtn;

    JButton modBtn, sqrtBtn, squareBtn, cubeBtn;

    String operator = "";

double num1 = 0, num2 = 0;

    public Calculator() {

        setTitle("Standard Calculator");

        setSize(400, 500);

        setLayout(null);

        setDefaultCloseOperation(EXIT_ON_CLOSE);

        display = new JTextField();

        display.setBounds(30, 30, 320, 40);

        display.setEditable(false);

        add(display);

        addBtn = new JButton("+");

        subBtn = new JButton("-");

        mulBtn = new JButton("*");

        divBtn = new JButton("/");

        eqBtn = new JButton("=");

        clrBtn = new JButton("C");

        modBtn = new JButton("%");

        sqrtBtn = new JButton("√");

        squareBtn = new JButton("x²");

        cubeBtn = new JButton("x³");

        JButton[] opButtons = {addBtn, subBtn, mulBtn, divBtn, eqBtn, clrBtn, modBtn, sqrtBtn, squareBtn, cubeBtn};

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

            numButtons[i] = new JButton(String.valueOf(i));

numButtons[i].addActionListener(this);

        }

        for (JButton btn : opButtons) {

            btn.addActionListener(this);

        }

    JPanel numPanel = new JPanel(new GridLayout(4, 3, 10, 10));

        numPanel.setBounds(30, 90, 230, 180);
```

```java
        for (int i = 1; i <= 9; i++)
numPanel.add(numButtons[i]);

        numPanel.add(numButtons[0]);

        numPanel.add(clrBtn);

        numPanel.add(eqBtn);

        add(numPanel);

        JPanel opPanel = new JPanel(new
GridLayout(5, 2, 10, 10));

        opPanel.setBounds(270, 90, 100,
230);

        opPanel.add(addBtn);

        opPanel.add(subBtn);

        opPanel.add(mulBtn);

        opPanel.add(divBtn);

        opPanel.add(modBtn);

        opPanel.add(sqrtBtn);

        opPanel.add(squareBtn);

        opPanel.add(cubeBtn);

        add(opPanel);

        setVisible(true);

    }
    public void
actionPerformed(ActionEvent e) {

        Object src = e.getSource();

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

            if (src == numButtons[i]) {

                display.setText(display.getText()
+ i);  return;

            }

        }

        if (src == clrBtn) {

            display.setText("");

            num1 = 0;

            num2 = 0;

            operator = "";

        } else if (src == addBtn || src ==
subBtn || src == mulBtn || src == divBtn ||
src == modBtn) {

            num1 =
Double.parseDouble(display.getText());

            operator = ((JButton)
src).getText();

            display.setText("");

        } else if (src == eqBtn) {

            num2 =
Double.parseDouble(display.getText());

            double result = 0;

            if (operator.equals("+")) result =
num1 + num2;

            else if (operator.equals("-")) result
= num1 - num2;

            else if (operator.equals("*")) result
= num1 * num2;

            else if (operator.equals("/")) result
= num1 / num2;

            else if (operator.equals("%")) result
= num1 % num2;


display.setText(String.valueOf(result));

        } else if (src == sqrtBtn) {

            double value =
Double.parseDouble(display.getText());

display.setText(String.valueOf(Math.sqrt(value)));
```

```java
        } else if (src == squareBtn) {

            double value =
Double.parseDouble(display.getText());

display.setText(String.valueOf(value *
value));

        } else if (src == cubeBtn) {

            double value =
Double.parseDouble(display.getText());

display.setText(String.valueOf(value *
value * value));

        }

    }

    public static void main(String[] args) {

        new Calculator();

    }

}
```
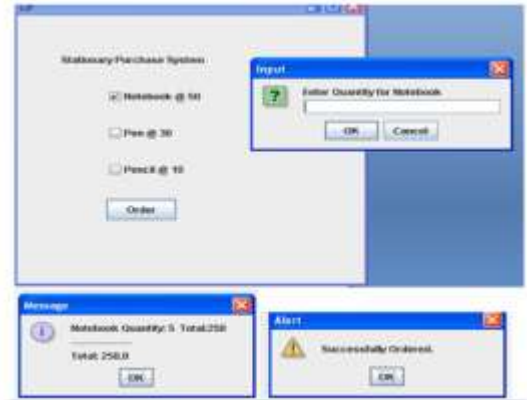
**Output**



2.mplement the following problem statement using Intellij IDEA.



```java
import javax.swing.*;

import java.awt.event.*;

import java.awt.*;

public class CheckBoxExample extends
JFrame implements ActionListener {

    JLabel l;

    JCheckBox cb1, cb2, cb3;

    JButton b;

    CheckBoxExample() {

        l = new JLabel("Stationary Purchase
System");

        l.setBounds(50, 50, 300, 20);

        cb1 = new JCheckBox("Notebook @
50");

        cb1.setBounds(100, 100, 150, 20);

        cb2 = new JCheckBox("Pen @ 30");

        cb2.setBounds(100, 150, 150, 20);

        cb3 = new JCheckBox("Pencil @
10");

        cb3.setBounds(100, 200, 150, 20);

        b = new JButton("Order");

        b.setBounds(100, 250, 80, 30);
```

```java
        b.addActionListener(this);

        add(l);

        add(cb1);

        add(cb2);

        add(cb3);

        add(b);

        setSize(400, 400);

        setLayout(null);

        setVisible(true);

        setDefaultCloseOperation(EXIT_ON_CLOSE);

    }

    public void actionPerformed(ActionEvent e) {

        float amount = 0;

        String msg = "";

        if (cb1.isSelected()) {

            int q = Integer.parseInt(JOptionPane.showInputDialog(this, "Enter Quantity for Notebook"));

            amount = amount + 50 * q;

            msg = msg + "Notebook Quantity: " + q + "  Total: " + (50 * q) + "\n";

        }

        if (cb2.isSelected()) {

            int q = Integer.parseInt(JOptionPane.showInputDialog(this, "Enter Quantity for Pen"));

            amount = amount + 30 * q;

            msg = msg + "Pen Quantity: " + q + "  Total: " + (30 * q) + "\n";

        }

        if (cb3.isSelected()) {

            int q = Integer.parseInt(JOptionPane.showInputDialog(this, "Enter Quantity for Pencil"));

            amount = amount + 10 * q;

            msg = msg + "Pencil Quantity: " + q + "  Total: " + (10 * q) + "\n";

        }

        msg += "-----------------\n";

        JOptionPane.showMessageDialog(this, msg + "Total: " + amount);

        JOptionPane.showMessageDialog(this, "Successfully Ordered.", "Alert", JOptionPane.WARNING_MESSAGE);

    }

    public static void main(String[] args) {

        new CheckBoxExample();

    }

}
```

**Output**