

# DON BOSCO INSTITUTE OF TECHNOLOGY



## **Skill Lab: C++ and Java Programming MINI PROJECT REPORT**

**On**

**“STAR TO DELTA , DELTA TO STAR”  
2021-22**

### **Submitted By:**

- |                          |    |
|--------------------------|----|
| 1. Aniket Shrimant Pawar | 04 |
| 2. Anushk Mahadev Sawant | 06 |
| 3. Nitish Pravin Chavan  | 18 |

Under the guidance of  
Ms. Deepali Kayande

**Mini Project Title : STAR TO DELTA , DELTA TO STAR CONVERSION**

**Institute Name : Don Bosco Institute of Technology.**

**Institute Address : Premier Automobiles Road,  
Kurla (West), Mumbai – 400070**

**Department : EXTC**

**Class : SE**

**Project Group Members :**

<b>Names of students</b>	<b>Roll No.</b>
1. Aniket Shrimant Pawar	04
2. Anushk Mahadev Sawant	06
3. Nitish Pravin Chavan	18

**Date of Submission :10\12\2021**

**Guide : Ms. Deepali Kayande**

## TABLE OF CONTENTS

<b>SR. NO.</b>	<b>CONTENT</b>	<b>PAGE NO.</b>
<b>CHAPTER 1</b>	INTRODUCTION	04
<b>CHAPTER 2</b>	IMPLEMENTATION	05
<b>CHAPTER 3</b>	RESULTS(SNAPSHOTS)	11
<b>CHAPTER 4</b>	CONCLUSION	12

# CHAPTER 1

## INTRODUCTION

Star-Delta Transformations and Delta-Star Transformations allow us to convert impedances connected together in a 3-phase configuration from one type of connection to another

The typical **three-phase networks** use two main methods by names which specify the way in which resistances are allied. In a star connection of the network, the circuit can be connected in symbol 'Y' model, similarly in a delta connection of the network; the circuit can be connected in symbol 'Δ'. We know that we can change the T-resistor circuit into the Y-type circuit for generating equivalent **Y- model network**. Similarly, we can change the  $\pi$ -resistor circuit for generating equivalent **Δ- model network**. So now it is very clear what is a star network circuit and delta network circuit, and how they transform into Y- model network as well as Δ-model network by using T-resistor and  $\pi$ -resistor circuits.

In star to delta conversion, the T-resistor circuit can be transformed to Y-type circuit to generate an equivalent Y- model circuit. The star to delta conversion can be defined as the value of the resistor on any one side of the Delta network, and the addition of all the two resistor product combinations in the star network circuit separate with the star resistor which is placed straightly opposite to the delta resistor being found. The star-delta transformation derivation is discussed below.

We can now solve simple series, parallel or bridge type resistive networks using Krichhoff circuit Law, mesh current analysis or nodal voltage analysis techniques but in a balanced 3-phase circuit we can use different mathematical techniques to simplify the analysis of the circuit and thereby reduce the amount of math's involved which in itself is a good thing.

Standard 3-phase circuits or networks take on two major forms with names that represent the way in which the resistances are connected, a **Star** connected network which has the symbol of the letter, Y (wye) and a **Delta** connected network which has the symbol of a triangle, Δ (delta).

If a 3-phase, 3-wire supply or even a 3-phase load is connected in one type of configuration, it can be easily transformed or changed it into an equivalent configuration of the other type by using either the **Star Delta Transformation** or **Delta Star Transformation** process.

A resistive network consisting of three impedances can be connected together to form a T or "Tee" configuration but the network can also be redrawn to form a **Star** or Y type network as shown below.

## **CHAPTER 2**

# **IMPLEMENTATION**

The main object of these system is to save the time of students to solve the problems in the electricals. These is also use for another users like professors , electrical engineer for problem solving. These system not only saves the time of user but also it is accurate up to 7 decimal points. We are trying to spread these system among all students for these is going to be useful .

The Project Star to Delta & Delta to Star conversion is made for electrical subject .this system is easy to handle ,user have two sections on main screen in which one is for Star to Delta & second is for Delta to Star conversion . In which user are able to give values of resistance simultaneously .

This system is easy so user only have to give input and click on button for answer . We have made the system for student point of view to saves the time and also who don't know the formula .

We have used the buttons and labels so system gets user friendly . These system also looks good so user can trust on it. Accuracy and good looking of the system is also important so user trust on system use the system many times.

## CODE

```
package lab;

import java.awt.BorderLayout;
import java.awt.EventQueue;

import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import javax.swing.JButton;
import javax.swing.JLabel;
import java.awt.Font;
import java.awt.Color;
import javax.swing.JTextField;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;

public class project extends JFrame {

    private JPanel contentPane;
    private JTextField textField;
    private JTextField textField_1;
    private JTextField textField_2;
    private JTextField textField_3;
    private JTextField textField_4;
    private JTextField textField_5;
    private JTextField textField_6;
    private JTextField textField_7;
    private JTextField textField_8;
    private JTextField textField_9;
    private JTextField textField_10;
    private JTextField textField_11;
```

```

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

/**
 * Create the frame.
 */
public project() {
    setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    setBounds(100, 100, 625, 494);
    contentPane = new JPanel();
    contentPane.setBackground(Color.YELLOW);
    contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
    setContentPane(contentPane);
    contentPane.setLayout(null);

    JLabel lblNewLabel = new JLabel("Star to Delta");
    lblNewLabel.setForeground(Color.RED);
    lblNewLabel.setFont(new Font("Tahoma", Font.BOLD, 16));
    lblNewLabel.setBounds(65, 39, 120, 20);
    contentPane.add(lblNewLabel);

    JLabel lblNewLabel_1 = new JLabel("Enter R1");
    lblNewLabel_1.setFont(new Font("Tahoma", Font.PLAIN, 16));
    lblNewLabel_1.setBounds(10, 99, 70, 13);
    contentPane.add(lblNewLabel_1);

    JLabel lblNewLabel_1_1 = new JLabel("Enter R2");
    lblNewLabel_1_1.setFont(new Font("Tahoma", Font.PLAIN, 16));
    lblNewLabel_1_1.setBounds(10, 145, 70, 13);
    contentPane.add(lblNewLabel_1_1);

    JLabel lblNewLabel_1_2 = new JLabel("Enter R3");
    lblNewLabel_1_2.setFont(new Font("Tahoma", Font.PLAIN, 16));
    lblNewLabel_1_2.setBounds(10, 187, 70, 13);
    contentPane.add(lblNewLabel_1_2);

    JLabel lblNewLabel_1_3 = new JLabel("Enter Ra");
    lblNewLabel_1_3.setFont(new Font("Tahoma", Font.PLAIN, 16));
    lblNewLabel_1_3.setBounds(339, 101, 70, 13);

```

```

contentPane.add(lblNewLabel_1_3);

JLabel lblNewLabel_1_4 = new JLabel("Enter Rb");
lblNewLabel_1_4.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_1_4.setBounds(339, 147, 70, 13);
contentPane.add(lblNewLabel_1_4);

JLabel lblNewLabel_1_5 = new JLabel("Enter Rc");
lblNewLabel_1_5.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_1_5.setBounds(339, 186, 70, 15);
contentPane.add(lblNewLabel_1_5);

JLabel lblDeltaToStar = new JLabel("Delta to Star");
lblDeltaToStar.setForeground(Color.RED);
lblDeltaToStar.setFont(new Font("Tahoma", Font.BOLD, 16));
lblDeltaToStar.setBounds(312, 39, 120, 20);
contentPane.add(lblDeltaToStar);

textField = new JTextField();
textField.setBounds(89, 98, 96, 19);
contentPane.add(textField);
textField.setColumns(10);

textField_1 = new JTextField();
textField_1.setColumns(10);
textField_1.setBounds(90, 144, 96, 19);
contentPane.add(textField_1);

textField_2 = new JTextField();
textField_2.setColumns(10);
textField_2.setBounds(89, 186, 96, 19);
contentPane.add(textField_2);

textField_3 = new JTextField();
textField_3.setColumns(10);
textField_3.setBounds(408, 98, 96, 19);
contentPane.add(textField_3);

textField_4 = new JTextField();
textField_4.setColumns(10);
textField_4.setBounds(408, 144, 96, 19);
contentPane.add(textField_4);

textField_5 = new JTextField();
textField_5.setColumns(10);
textField_5.setBounds(408, 186, 96, 19);
contentPane.add(textField_5);

JButton btnNewButton = new JButton("Star to Delta");
btnNewButton.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        Float R1,R2,R3,Ra,Rb,Rc;

```



```

        R1=Float.parseFloat(textField.getText());
        R2=Float.parseFloat(textField_1.getText());
        R3=Float.parseFloat(textField_2.getText());
        Ra=R2+R3+(R2*R3)/R1;
        Rb=R1+R3+(R1*R3)/R2;
        Rc=R2+R1+(R2*R1)/R3;
        textField_6.setText(Float.toString(Ra));
        textField_7.setText(Float.toString(Rb));
        textField_8.setText(Float.toString(Rc));
    }

});
btnNewButton.setBackground(Color.MAGENTA);
btnNewButton.setFont(new Font("Tahoma", Font.BOLD, 16));
btnNewButton.setBounds(10, 271, 135, 21);
contentPane.add(btnNewButton);

JLabel lblNewLabel_2 = new JLabel(" Ra :-");
lblNewLabel_2.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_2.setBounds(10, 329, 45, 13);
contentPane.add(lblNewLabel_2);

JLabel lblNewLabel_2_1 = new JLabel(" Rb :-");
lblNewLabel_2_1.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_2_1.setBounds(10, 364, 45, 13);
contentPane.add(lblNewLabel_2_1);

JLabel lblNewLabel_2_2 = new JLabel(" Rc :-");
lblNewLabel_2_2.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_2_2.setBounds(10, 399, 45, 13);
contentPane.add(lblNewLabel_2_2);

JButton btnDeltaToStar = new JButton("Delta to Star");
btnDeltaToStar.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        float R1,R2,R3,Ra,Rb,Rc;
        Ra=Float.parseFloat(textField_3.getText());
        Rb=Float.parseFloat(textField_4.getText());
        Rc=Float.parseFloat(textField_5.getText());
        R1=Rb*Rc/(Ra+Rb+Rc);
        R2=Ra*Rc/(Ra+Rb+Rc);
        R3=Rb*Ra/(Ra+Rb+Rc);
        textField_9.setText(Float.toString(R1));
        textField_10.setText(Float.toString(R2));
        textField_11.setText(Float.toString(R3));
    }
});
btnDeltaToStar.setFont(new Font("Tahoma", Font.BOLD, 16));
btnDeltaToStar.setBackground(Color.MAGENTA);
btnDeltaToStar.setBounds(312, 273, 135, 21);
contentPane.add(btnDeltaToStar);

```

```
textField_6 = new JTextField();
textField_6.setBounds(89, 328, 96, 19);
contentPane.add(textField_6);
textField_6.setColumns(10);
```

```
textField_7 = new JTextField();
textField_7.setColumns(10);
textField_7.setBounds(89, 363, 96, 19);
contentPane.add(textField_7);
```

```
textField_8 = new JTextField();
textField_8.setColumns(10);
textField_8.setBounds(89, 398, 96, 19);
contentPane.add(textField_8);
```

```
JLabel lblNewLabel_2_3 = new JLabel(" R1 :-");
lblNewLabel_2_3.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_2_3.setBounds(348, 331, 45, 13);
contentPane.add(lblNewLabel_2_3);
```

```
JLabel lblNewLabel_2_4 = new JLabel(" R2 :-");
lblNewLabel_2_4.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_2_4.setBounds(348, 366, 45, 13);
contentPane.add(lblNewLabel_2_4);
```

```
JLabel lblNewLabel_2_5 = new JLabel(" R3 :-");
lblNewLabel_2_5.setFont(new Font("Tahoma", Font.PLAIN, 16));
lblNewLabel_2_5.setBounds(348, 401, 45, 13);
contentPane.add(lblNewLabel_2_5);
```

```
textField_9 = new JTextField();
textField_9.setColumns(10);
textField_9.setBounds(408, 328, 96, 19);
contentPane.add(textField_9);
```

```
textField_10 = new JTextField();
textField_10.setColumns(10);
textField_10.setBounds(408, 363, 96, 19);
contentPane.add(textField_10);
```

```
textField_11 = new JTextField();
textField_11.setColumns(10);
textField_11.setBounds(408, 398, 96, 19);
contentPane.add(textField_11);
```

```
JLabel lblNewLabel_3 = new JLabel("Welcome to the World of Engineering");
lblNewLabel_3.setForeground(Color.BLUE);
lblNewLabel_3.setBackground(Color.MAGENTA);
lblNewLabel_3.setFont(new Font("Arial Black", Font.BOLD, 18));
lblNewLabel_3.setBounds(89, 10, 427, 21);
contentPane.add(lblNewLabel_3);
```

```
}
```

}

## CHAPTER 4

### RESULT



#### Welcome to the World of Engineering

##### Star to Delta

Enter R1

Enter R2

Enter R3

##### Delta to Star

Enter Ra

Enter Rb

Enter Rc

##### Star to Del...

Ra :-

Rb :-

Rc :-

##### Delta to St...

R1 :-

R2 :-

R3 :-

## **CHAPTER 5**

### **CONCLUSION**

The Star-Delta Transformation ( $Y-\Delta$ ) is a mathematical technique given by Edwin Kennelly in 1899 and is used to solve complex 3-phase resistive electrical circuits by transforming from Star( $Y$ ) design to Delta( $\Delta$ ) design with the help of formulas. The equivalent star resistance connected to a given terminal, is equal to the product of the two delta resistances connected to the same terminal divided by the sum of the delta connected resistances.

These application is base on the formula of the conversion. If user use these application for Star to Delta & Delta to Star conversion user definitely saves time and get a accurate answer for their problems.

