# Assignment: Hands on Learning (HOL)

# Title: BJT Astable Multivibrator PCB Design using KiCad

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**Course Name / Instructor**

Mastering KiCAD: Open-Source PCB Design for Beginners

Maheen Rasheed

**Objectives:**

The aim of this project is to design and layout a Printed Circuit Board (PCB) for a BJT-based Astable Multivibrator using only through-hole components. The design was completed using the open-source KiCad EDA tool, covering schematic creation, footprint mapping, layout, and 3D visualization.

**Circuit Description**

An astable multivibrator is a free-running oscillator that continuously switches between two states without external triggering. It uses two NPN transistors that alternately turn ON and OFF, producing a square wave output.

**Tools Used**

List of tools and resources:

- **KiCad EDA v9.0** for schematic, layout, and 3D rendering
- **OS** : Windows

**Design Process**

**A. Schematic Creation**

- Key components: BJT (2N3904 or similar), resistors, capacitors
- Performed Annotation, labeling, and ERC check

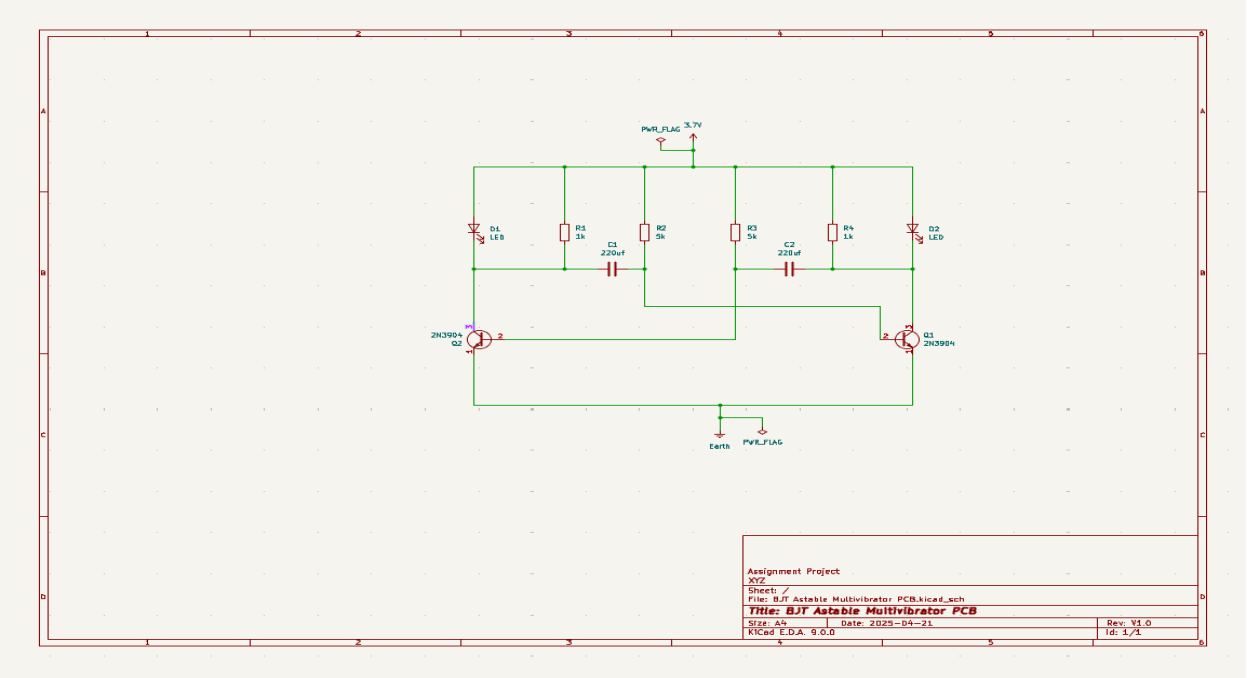


Fig 1: Schematic of BJT Astable Multivibrator

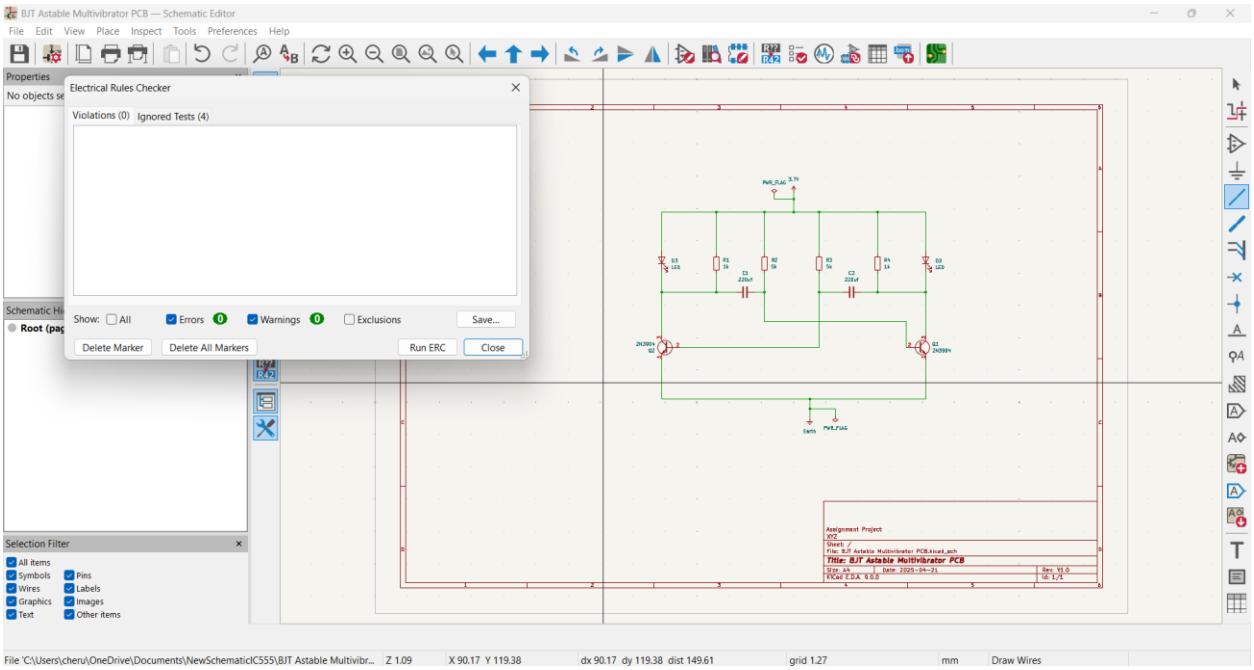


Fig 2: ERC output of BJT Astable Multivibrator

## B. Footprint Assignment

- Only **through-hole** packages used

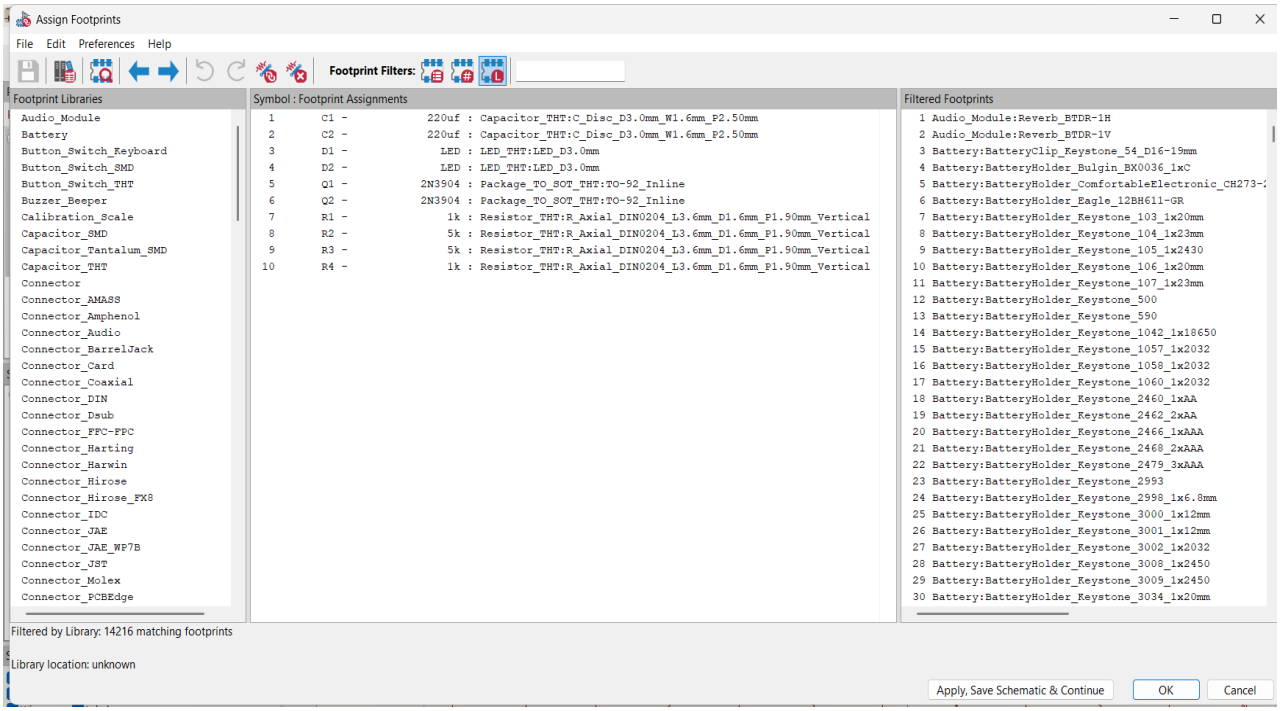


Fig 3: Footprint Assignment to the components

## C. PCB Layout

- Board setup: 2-layer board
- Manual routing using **rat's nest** view is performed & checked for errors using DRC

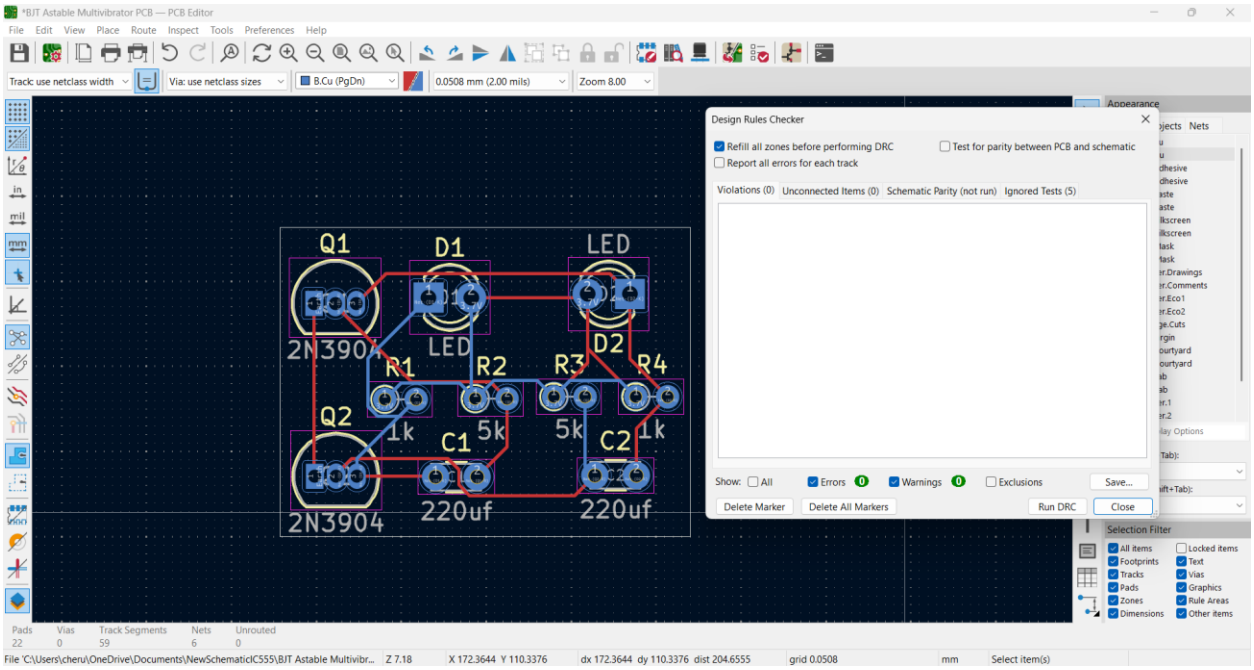


Fig 4: PCB 2-layer board

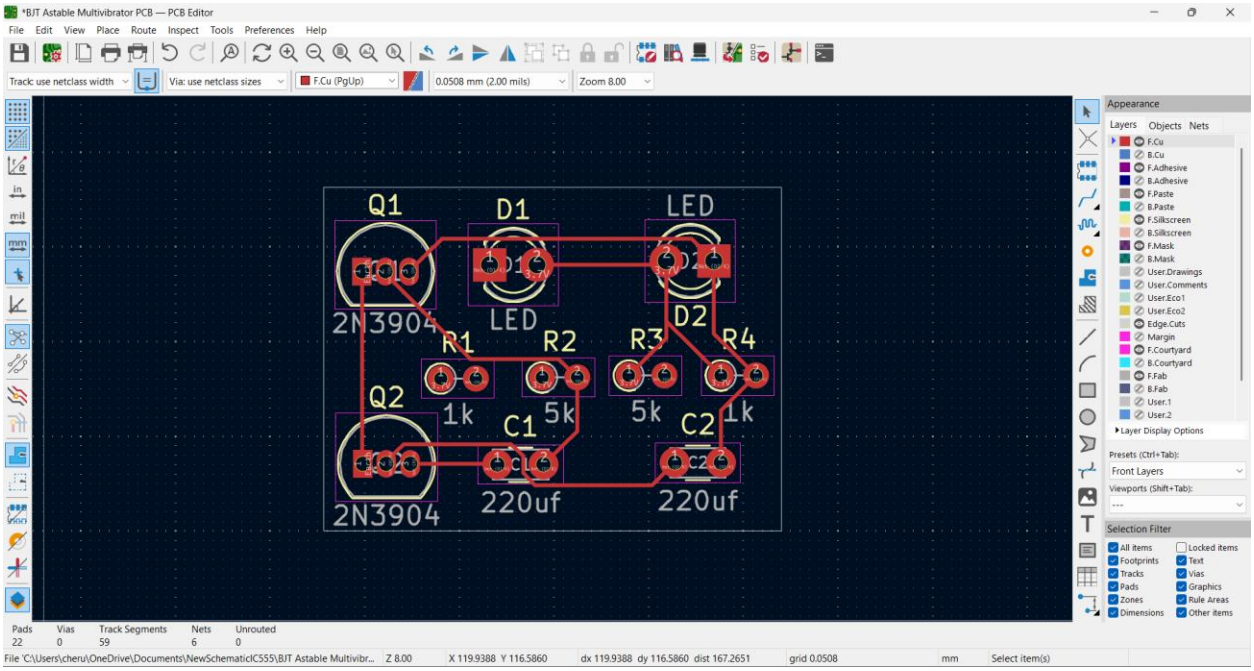


Fig 5: PCB Front layer board

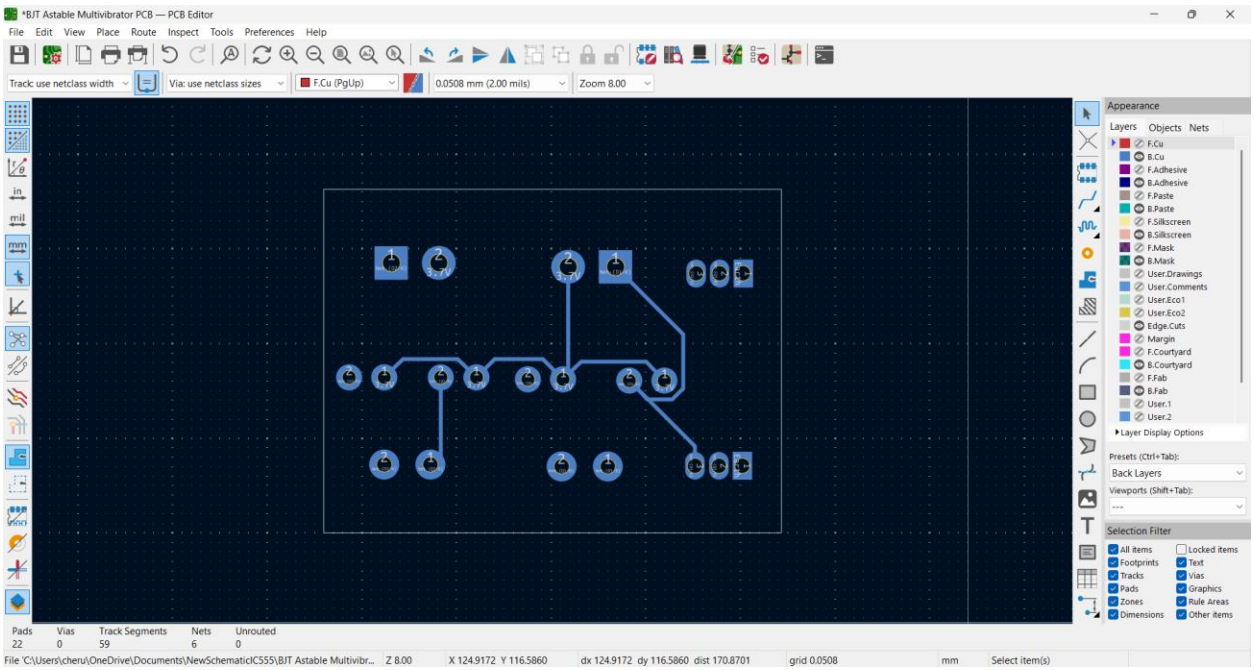


Fig 6: PCB Back layer board

## D. 3D View

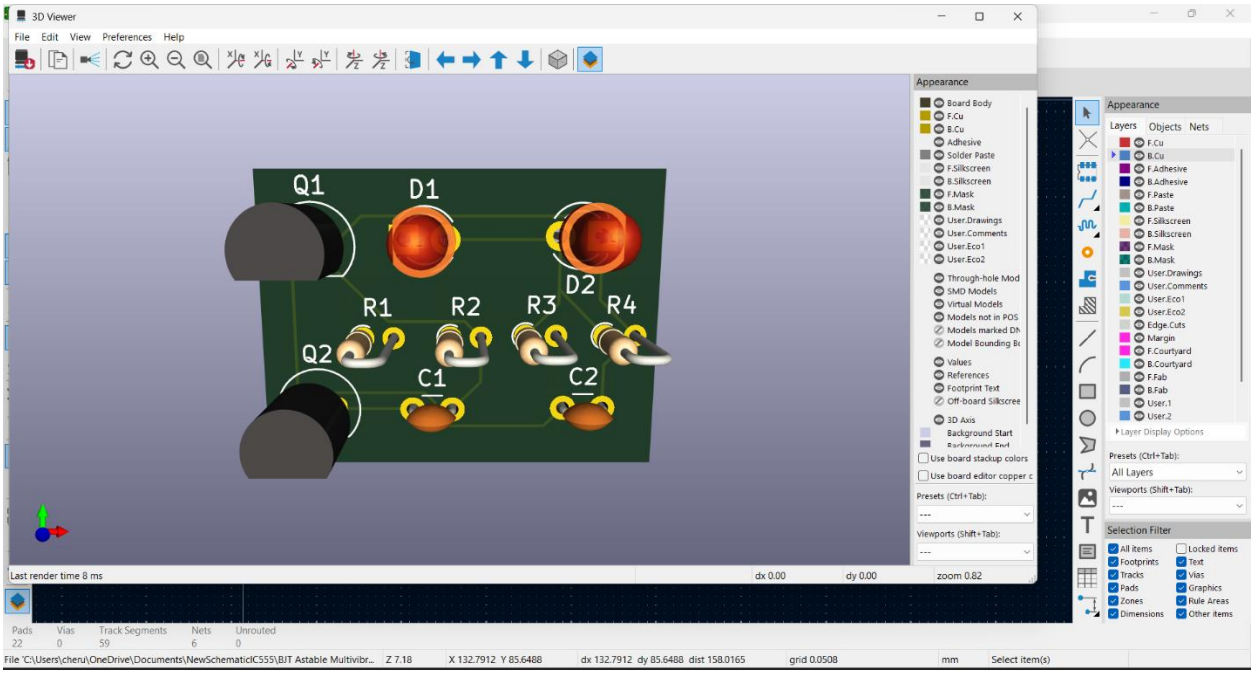


Fig 7: 3-D View of PCB board

## Conclusion

This project helped me gain practical experience in using KiCad for schematic design, PCB layout, and visualization. I now understand how to design a basic functional PCB and generate deliverables for fabrication.