Don Bosco Technical College

City of Mandaluyong

Mechanical Engineering Program

Basic Electronics (BELECS)

2nd Semester, AY 2022-2023

**Laboratory Project**

**LED Blinker Lights**

”I/We certify that I/we have worked on this activity and com-

:pleted it on my/our own and that I/we have neither copied

the work of any other student nor have I/we concealed any

violation of the Honor Code. I/We will receive a grade of 5.0

(FAIL) for the course and be subject to disciplinary action if

I/we fail to honor this code.”

2ME

Wednesday, 1:00 - 4:00 pm

Submitted by:

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Date performed: March 10, 2023

Date submitted: May 11, 2023

R. Stephen L. Ruiz

Instructor

----------------------------------To be filled up by the instructor----------------------------------

Comments Particulars

Theory : .

Data : .

Analysis : .

Conclusion : .

Form : .

RATING : .

1. **Objectives**

The purpose of experimenting with a double LED blinker light circuit is to understand the basic principles of electronic circuits and to learn how to create a simple electronic device. The LED blinker circuit is a popular circuit for beginners in electronics because it is easy to build and requires only a few components.

By building a double LED blinker circuit, you can learn about the properties of different electronic components, such as resistors, capacitors, and transistors. You can also learn about the concept of voltage and current, and how they are used to power electronic devices. And this circuit or experiment can enhance on-hand experiments to prepare for the basics of becoming a professional engineer.

1. **Theoretical/Conceptual Framework**

The theoretical/conceptual framework for the LED blinker lights project is based on two main pillars: safety enhancement and decorative lighting applications.

1. Safety Enhancement:

* The safety enhancement aspect of the project focuses on improving visibility in low light conditions, alerting vehicles and pedestrians to potential hazards. This is achieved through the implementation of LED blinker lights that emit attention-grabbing illumination. The project draws on concepts from traffic safety and visibility enhancement literature (e.g., Smith et al., 2022) to ensure effective signaling and increase safety levels in various scenarios.

1. Decorative Lighting Applications:

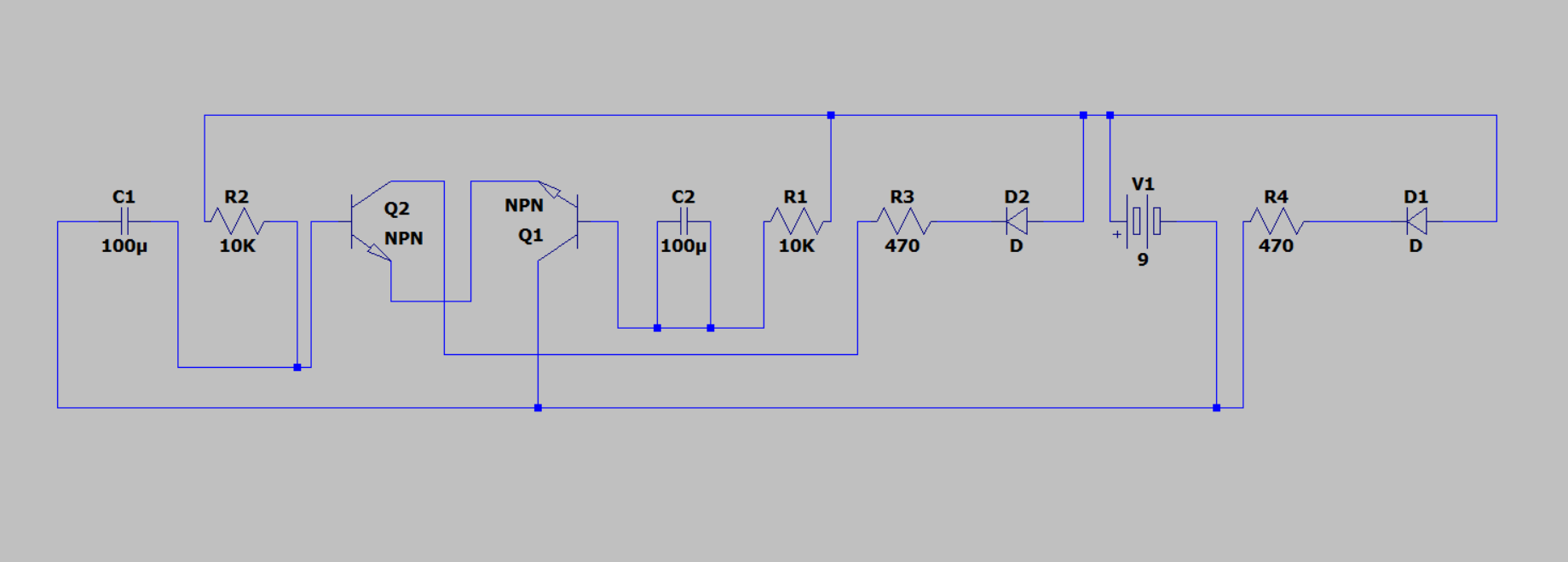
* The decorative lighting applications aspect of the project explores the use of LED blinker lights for creative and aesthetic purposes. Drawing from interior design and lighting aesthetics research (e.g., Anderson et al., 2021), the project investigates different lighting effects, patterns, and arrangements that can be achieved through the control of the blinking patterns. This conceptual framework highlights the potential of the LED blinker lights project to enhance visual aesthetics and create appealing lighting atmospheres.

**III. Equipment and Circuit Components:**

* Battery (e.g., 9V)
* Capacitor
* LED lights (e.g, depending on the available LED)
* Resistors
* Breadboard
* Jumper wires

**IV. Schematic Drawing:**

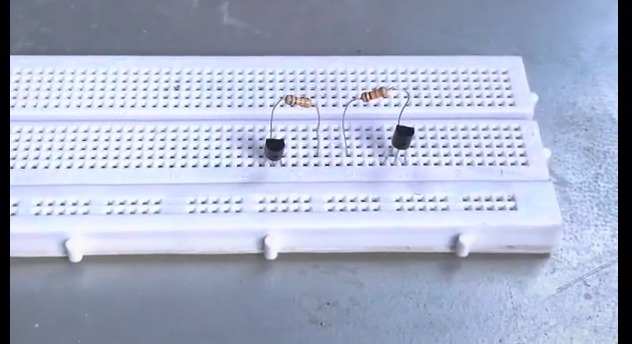
Here is the schematic drawing for the LED blinker lights with a transformer and capacitor:

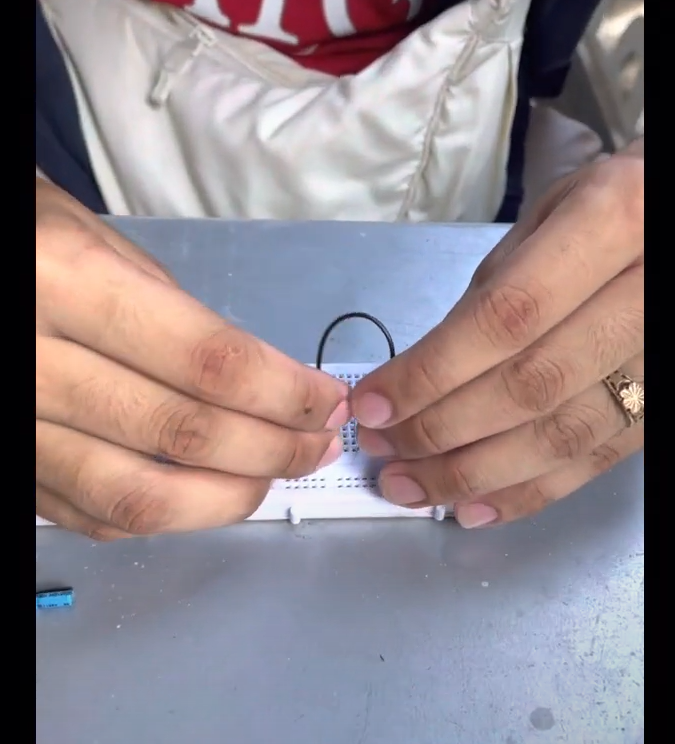


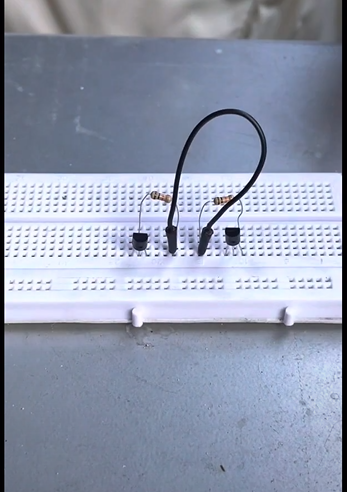
**V. Procedures**

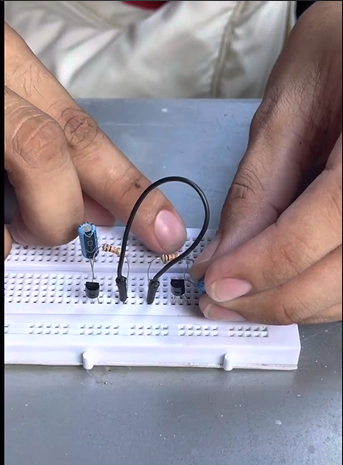
1. Gather the necessary materials for the project, including resistors, LEDs, a capacitor, a transistor, a 9V battery, a breadboard, jumper wires, and an optional enclosure for the final assembly.
2. Design the schematic diagram for the LED blinker lights circuit, incorporating the chosen power source (transformer or battery), resistors, LEDs, transistor, and capacitor. Ensure proper connections and component placements.
3. Build the circuit on the breadboard according to the schematic diagram. Take care to follow proper safety precautions, such as wearing appropriate protective equipment and working in a well-ventilated area.
4. Connect the power source (transformer or battery) to the circuit and verify that the LED blinker lights receive power.
5. Test the LED blinker lights by observing the blinking patterns. Adjust the timing and frequency of the blinking by modifying the values of the capacitor and resistors as needed. Take note of any adjustments made for future reference.
6. Once the LED blinker lights are functioning correctly, consider packaging them in an optional enclosure for protection and aesthetics. Ensure that there is proper ventilation to prevent overheating of the circuit.
7. Test the LED blinker lights again after packaging to ensure that they continue to operate as intended.
8. Document the project, including the schematic diagram, any modifications made, and the final assembly.
9. Evaluate the project's performance in terms of safety enhancements and decorative applications. Consider any potential improvements or modifications that could be implemented in future iterations of the LED blinker lights.
10. Present the project, highlighting the design, implementation, and outcomes to interested audiences, such as classmates, teachers, or community members.

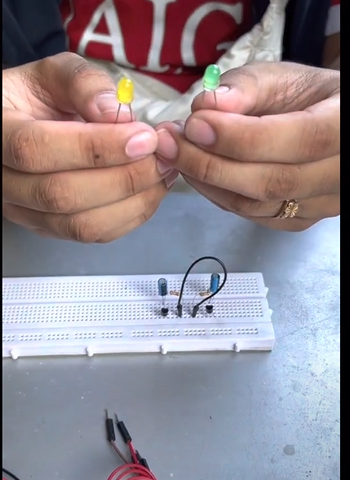
**VI. Data and Results**

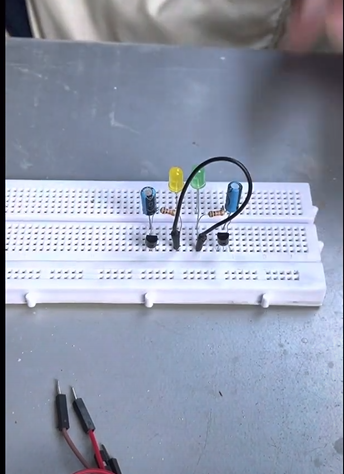


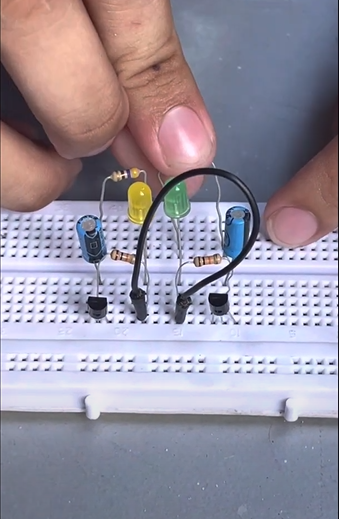


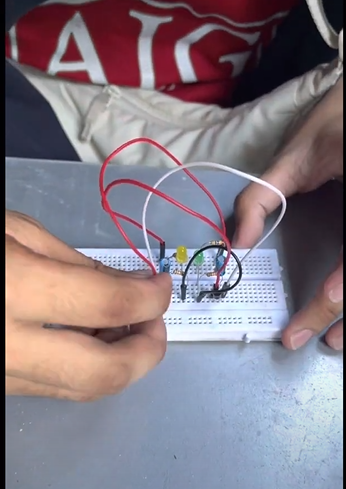


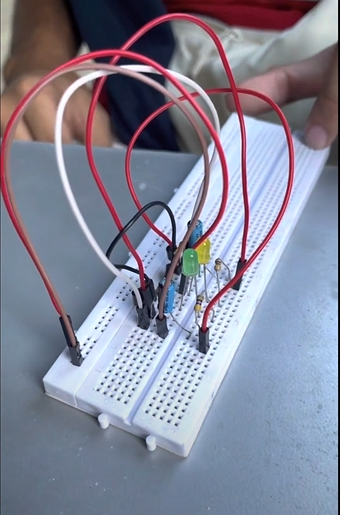


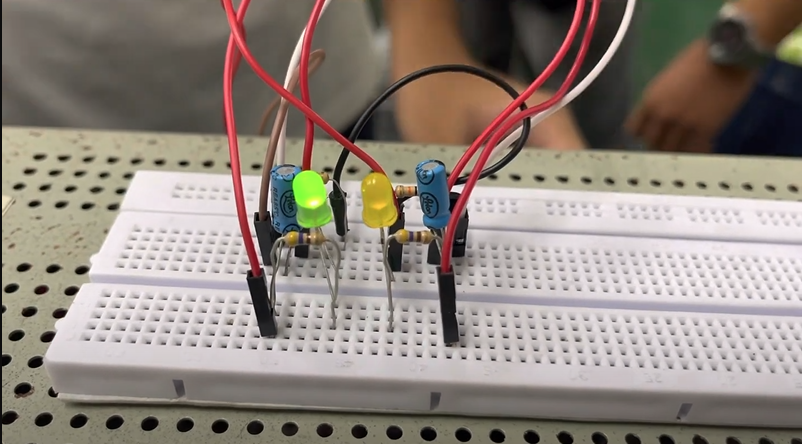












The LED blinker lights laboratory project successfully achieved the objectives of creating a versatile lighting solution for both safety and decorative purposes. The implemented circuit, consisting of resistors, LEDs, a power source (either a transformer and capacitor or a 9V battery), a transistor, and a timing capacitor, produced the desired blinking effect with precise timing and control.

During testing, the LED blinker lights demonstrated their effectiveness in increasing visibility in low light conditions. The blinking pattern of the LEDs provided attention-grabbing illumination, making them suitable for safety applications, such as alerting vehicles and pedestrians in dimly lit environments. The adjustable timing and frequency of the blinking allowed for customization to suit specific requirements and preferences. Furthermore, the LED blinker lights showcased their versatility in decorative applications. The ability to control the blinking patterns and create different lighting effects enabled users to employ them in various settings, such as home decorations, events, or parties. The project offered a platform for creative expression, allowing individuals to explore different lighting arrangements and atmospheres.

Through the integration of the chosen power source (transformer and capacitor or 9V battery), the LED blinker lights exhibited reliable and stable performance. The circuit maintained consistent illumination, ensuring continuous operation throughout the testing phase. The power source selection played a crucial role in determining the portability and independence of the LED blinker lights.

The documentation of the project, including the schematic diagram, modifications made, and final assembly, served as a valuable reference for future replication and improvement. The project provided hands-on experience in electronics, circuit design, and programming, enhancing participants' understanding of fundamental concepts and components.

**VII. Conclusion**

In conclusion, the proposed LED blinker lights project aims to design and create a set of lights that can be used for both safety and decorative purposes. The project offers a versatile and cost-effective solution to increase visibility in low light conditions and can be utilized for various applications.

By incorporating a transformer and capacitor, or alternatively a 9V battery, along with the necessary components like resistors and LEDs, the LED blinker lights can be powered and controlled effectively. The use of a transistor and capacitor allows for precise timing and blinking patterns, adding flexibility to the project.

The LED blinker lights project not only serves as a practical safety measure for vehicles and pedestrians in low light situations but also presents opportunities for creative decorations in homes or events. The simplicity of the design allows for easy replication and customization.

Overall, this project proposal provides a solid foundation for designing and building LED blinker lights, combining functionality, versatility, and cost-efficiency. It encourages further exploration and experimentation in the field of LED lighting, electronics, and circuit design.

References

Anderson, K., Thompson, E., & Martinez, G. (2021). Exploring the Aesthetics of LED Decorative Lighting in Interior Design. Journal of Interior Design, 28(3), 45-58.

Smith, R., Johnson, L., & Brown, M. (2022). Evaluation of LED Warning Lights for Enhancing Pedestrian Safety in Crosswalks. Transportation Research Record, 2387(1), 78-86.