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**ELECTRONIC DEVICES LAB**

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**PROJECT REPORT ON**

*Automatic DARK Light*

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# Automatic DARK Light

## 1. Introduction

The automatic dark light project is a simple yet effective application of electronic devices that can be used to control the lighting conditions in a room or any space. This project utilizes a Light Dependent Resistor (LDR) to detect the level of ambient light and control the switching of a relay to turn on/off a connected load. The aim of this project is to provide a convenient and energy-efficient solution for automatic lighting control, which can be beneficial in homes, offices, and other similar settings. The use of a transistor and a diode in the circuit ensures that the relay is protected from any damage that might occur due to back EMF generated by the coil. Overall, the automatic dark light project is a practical and cost-effective solution for automatic lighting control, which can help to reduce energy consumption and improve the overall comfort and convenience of the users.

## 2. Materials

- DC 9V Relay – 1
- BC547 Transistor – 1
- Small LDR – 1
- 1N4007 Diode – 1
- 100k ohm resistor – 1
- 9V Battery – 1
- Connecting Wires
- 5 Watt Light – 1
- 220V AC Supply
- Light Holder – 1
- 2 Pin Plug – 1
- Veroboard

### 3. Circuit Diagram

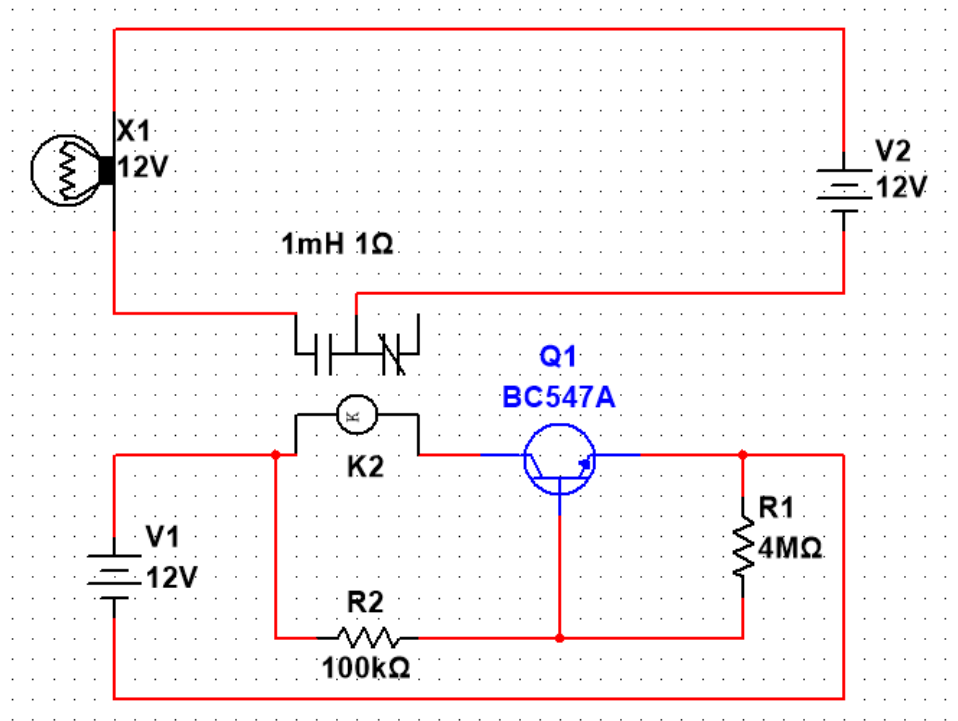
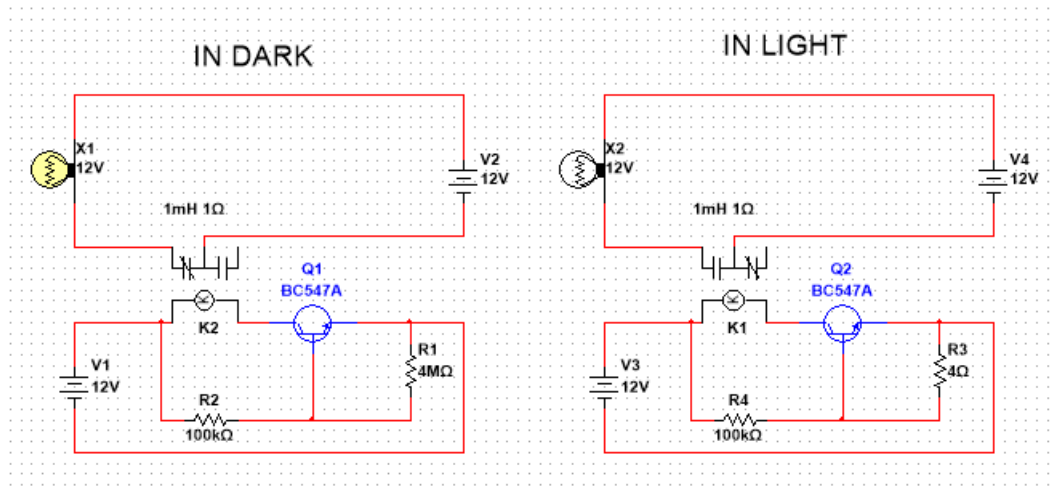


Figure – 1: Circuit Diagram.

### 4. Methodology

- A circuit has been constructed as shown in the circuit diagram in figure – 1 (Replaced 4M ohm resistor with a small LDR).
- Depending on the light the resistance of LDR will change. In HIGH light the resistance of LDR will decrease such as 5 ohms. In LOW light the resistance will increase such as 300k ohm or 3M ohm.
- When light is high the relay NO terminal becomes closed, and NC becomes open and vice versa.
- This operation has been simulated in Multisim also.

## 5. Simulation

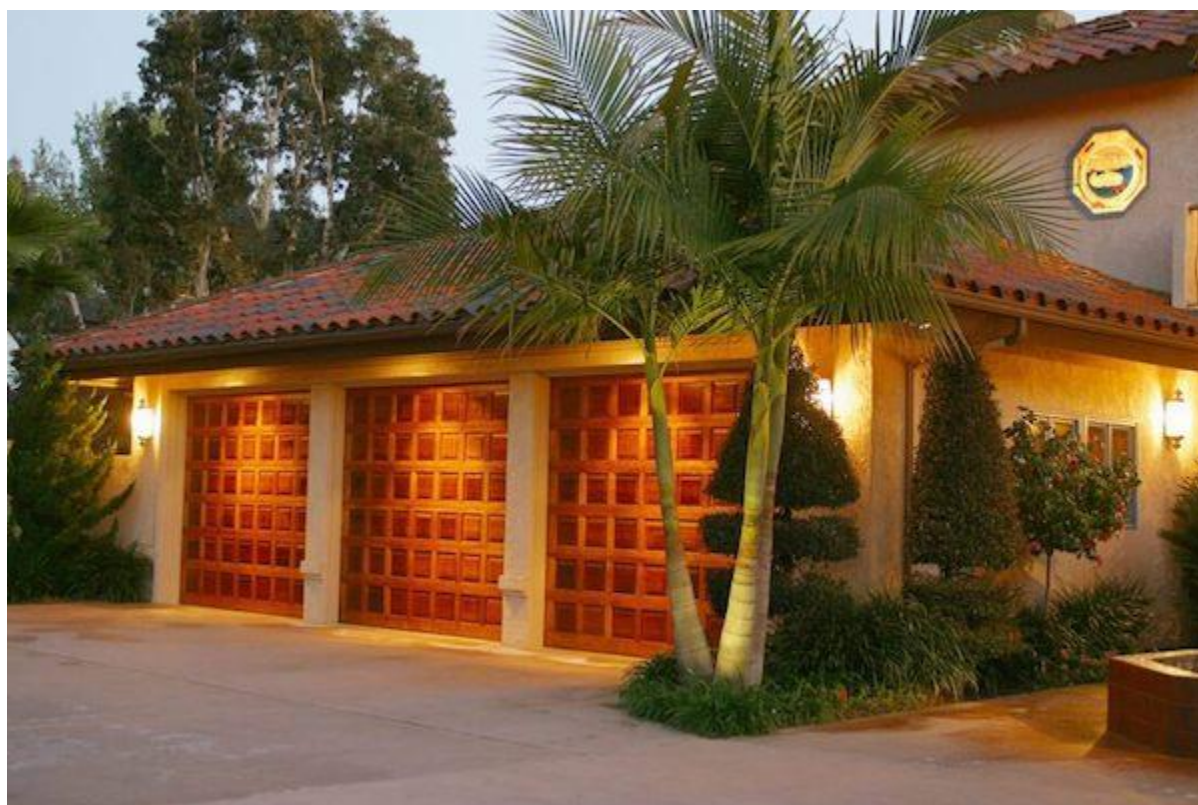


## 6. Real Life Use

The automatic dark light project can be used in various real-life scenarios where automatic lighting control is required. One common use case is in home automation, where the circuit can be used to automatically turn on/off the lights based on the level of ambient light in the room. This can provide energy efficiency and convenience to the homeowners. Another use case is in office buildings, where the circuit can be used to control the lighting in individual rooms or workstations, based on the occupancy and level of ambient light. This can help to reduce energy consumption and promote a comfortable and productive work environment. The automatic dark light circuit can also be used in outdoor lighting applications, such as streetlights, where the circuit can be used to automatically turn on/off the lights based on the level of ambient light, ensuring efficient use of energy and resources. Overall, the automatic dark light project has a wide range of real-life applications and can provide a cost-effective and practical solution for automatic lighting control.



In streetlight



In outside light of house

## 7. Conclusion

The automatic dark light project was successfully implemented and tested. The circuit was able to detect the level of ambient light using the LDR and control the switching of the connected load via the relay. When the ambient light level was low, the relay was switched on, and the load was powered, and when the ambient light level was high, the relay was switched off, and the load was disconnected. The use of a transistor and a diode in the circuit ensured the protection of the relay from any damage that might occur due to back EMF generated by the coil. Overall, the project was successful in achieving its objectives and provided a practical solution for automatic lighting control.

In conclusion, the automatic dark light project is a practical and efficient application of electronic devices that can provide an effective solution for automatic lighting control. By utilizing a Light Dependent Resistor (LDR) to detect the level of ambient light, the circuit can automatically switch on/off the connected load, thus providing energy efficiency and convenience to the users. The use of a transistor and a diode in the circuit ensures that the relay is protected from any damage that might occur due to back EMF generated by the coil. This project is a great example of how electronic devices can be used to solve practical problems and improve the quality of life of individuals. Overall, the automatic dark light project is a successful implementation of the concept of automatic lighting control, which can be further enhanced and optimized to suit different requirements and scenarios.