PSG COLLEGE OF TECHNOLOGY(AUTONOMOUS)

analog ELECTRONICS

19l302

Electronics and communication engineering

Topic: Simulation On Automatic Light Switch Circuit

Submitted by:
Batch:12
20l108-Dhevaa Dharshinie B
20l116-Jeyashri R
20l141-Sheena S

Submitted to:
MR S Sainath.
DEPARTMENT OF ECE.
PSG COLLEGE OF TECHNOLOGY.

CONTENTS

INTRODUCTION:

In order to save non-renewable resources and man power,this automatic light switch can be implemented in various fields. Here we will look about its application in street lights. This circuit can perform both day and night/light and dark detecting errands. It contains LDR which acts as a light detecting sensor.

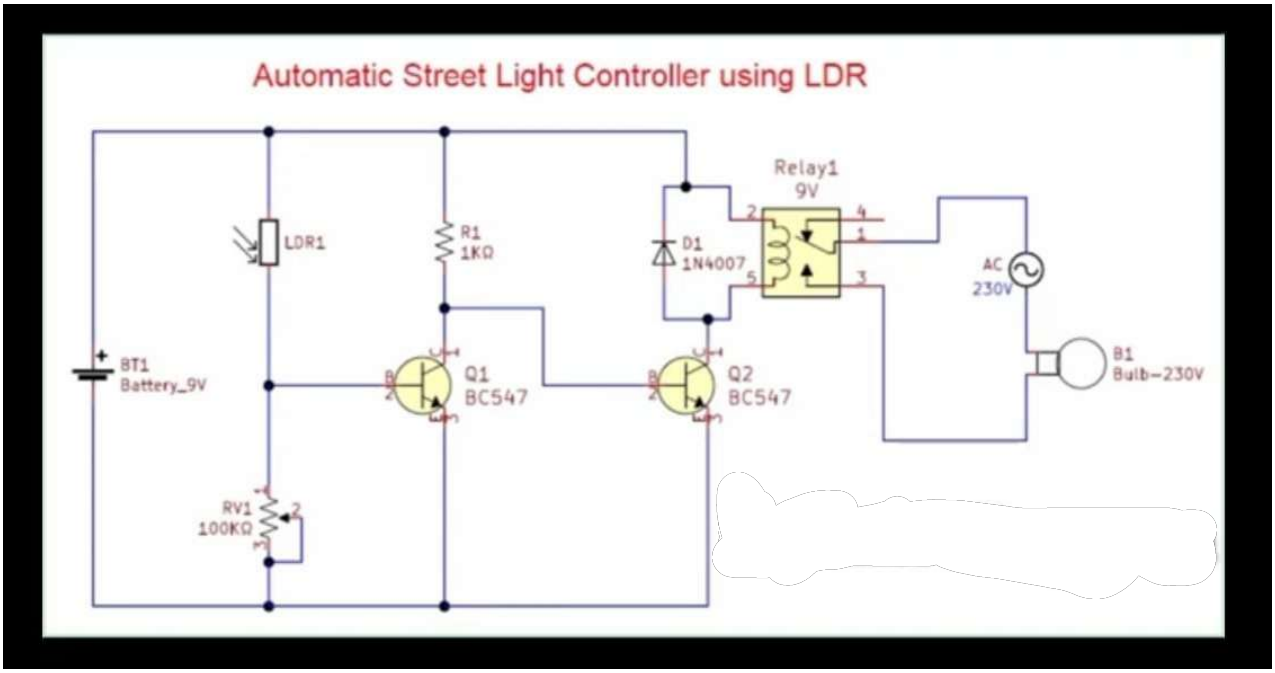
COMPONENTS REQUIRED:

- DC VOLTAGE (12V)
- LDR(POTENTIOMETER IS USED HERE)
- Transistor(BC547-2)
- ,Resistor, (1K-2),
- Relay
- ,Diode(1N4007-1)
- Bulb
- AC source

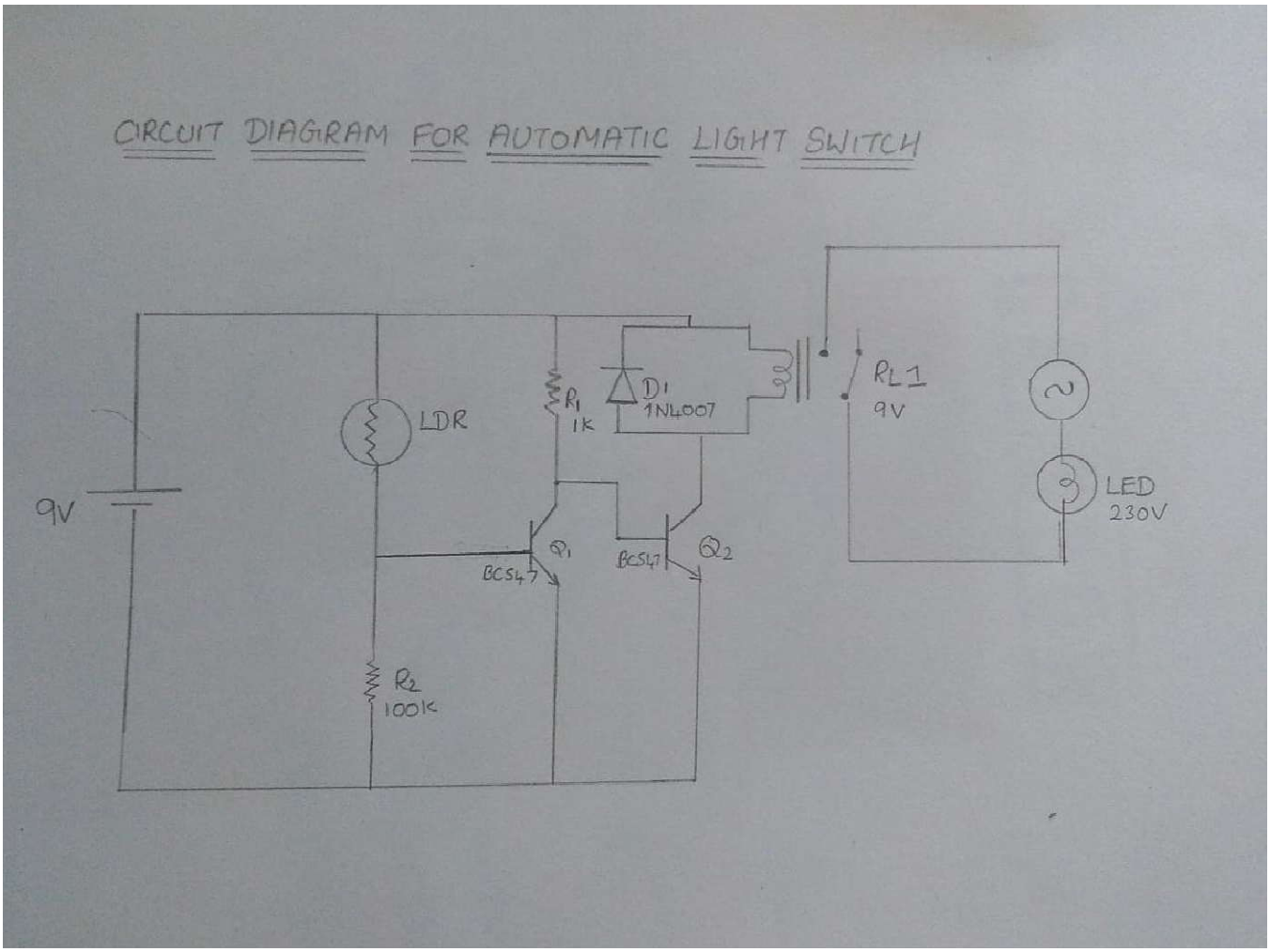
SIMULATION TOOL:

Proto Circuit Simulator.

CIRCUIT:



CIRCUIT DIAGRAM:



COMPONENT WORKING:

LDR:

LDR (Photoresistor) is a type of variable resistor whose resistance increases to Mega ohms , when the intensity of light is reduced and decreases to a few hundred ohms when there is sufficient light. It means in a dark place or when no light falls on LDR, the resistance is very HIGH and in sufficient light, the resistance of LDR is very LOW.

RELAY CIRCUIT:

A relay is an electromagnetic switch that is used to turn on and turn off a circuit by a low power signal, or where several circuits must be controlled by one signal.

WORKING:

Two NPN transistors are used to switching operations. The LDR is connected between the supply voltage and Base terminal of transistor Q2. The Emitter terminal of this transistor is connected with the ground through a variable resistor or potentiometer (POT). This variable resistor is used to adjust the sensitivity of the circuit.

OFF CONDITION

During day time When Light falls on LDR then conductivity increased and current flows between supply to the base of the transistor and then transistor Q1 will on. Transistor Q1 And Transistor Q2 are connected as NOT Gate. When transistor Q1 is on by conducting even small current on base, The output of transistor Q2 is LOW (OFF).

ON CONDITION

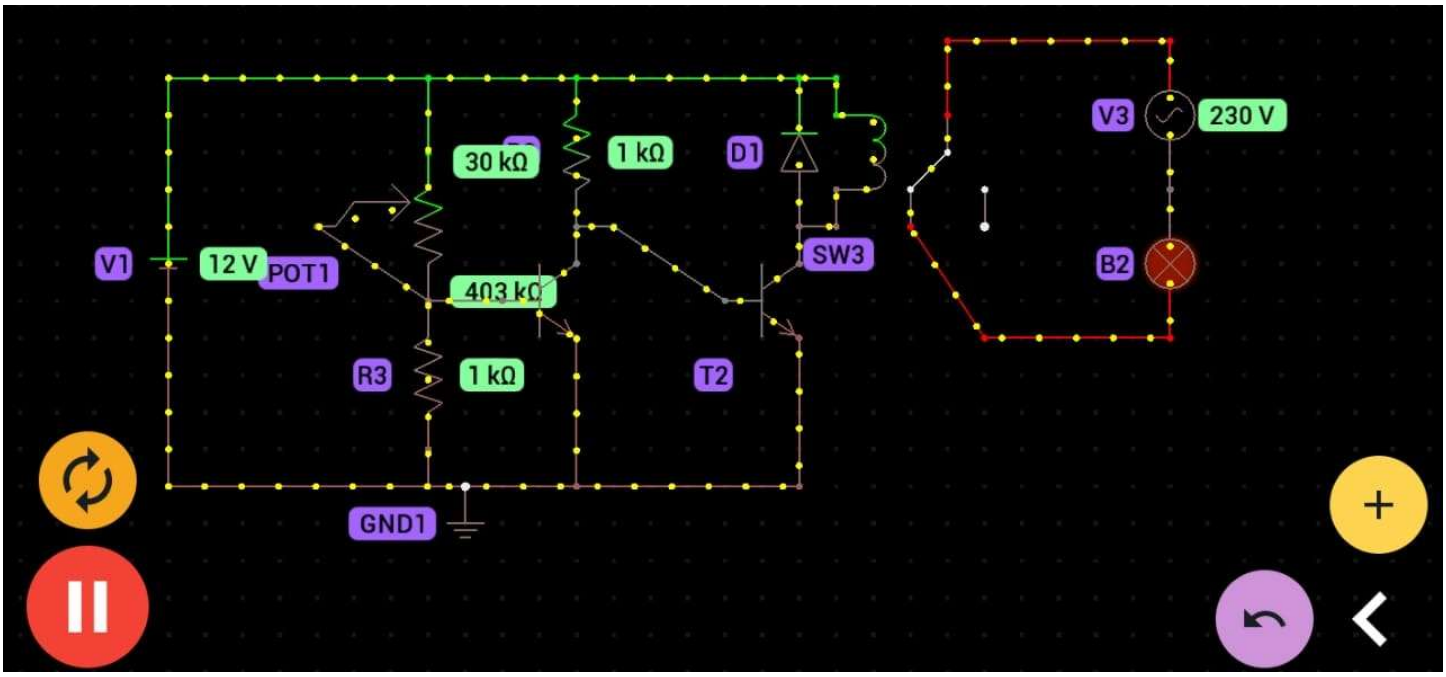
At night when no light falls on LDR, then high resistance will be created and there is no current flow on the base of transistor Q2. As there is no supply on the base of transistor Q1, this is in OFF state, When this transistor has LOW input then the output of Transistor Q2 will HIGH When transistor Q2 is in HIGH mode then is energized (turned on) the relay connected with its collector and Electric Lamp will be Switched ON.

APPLICATIONS

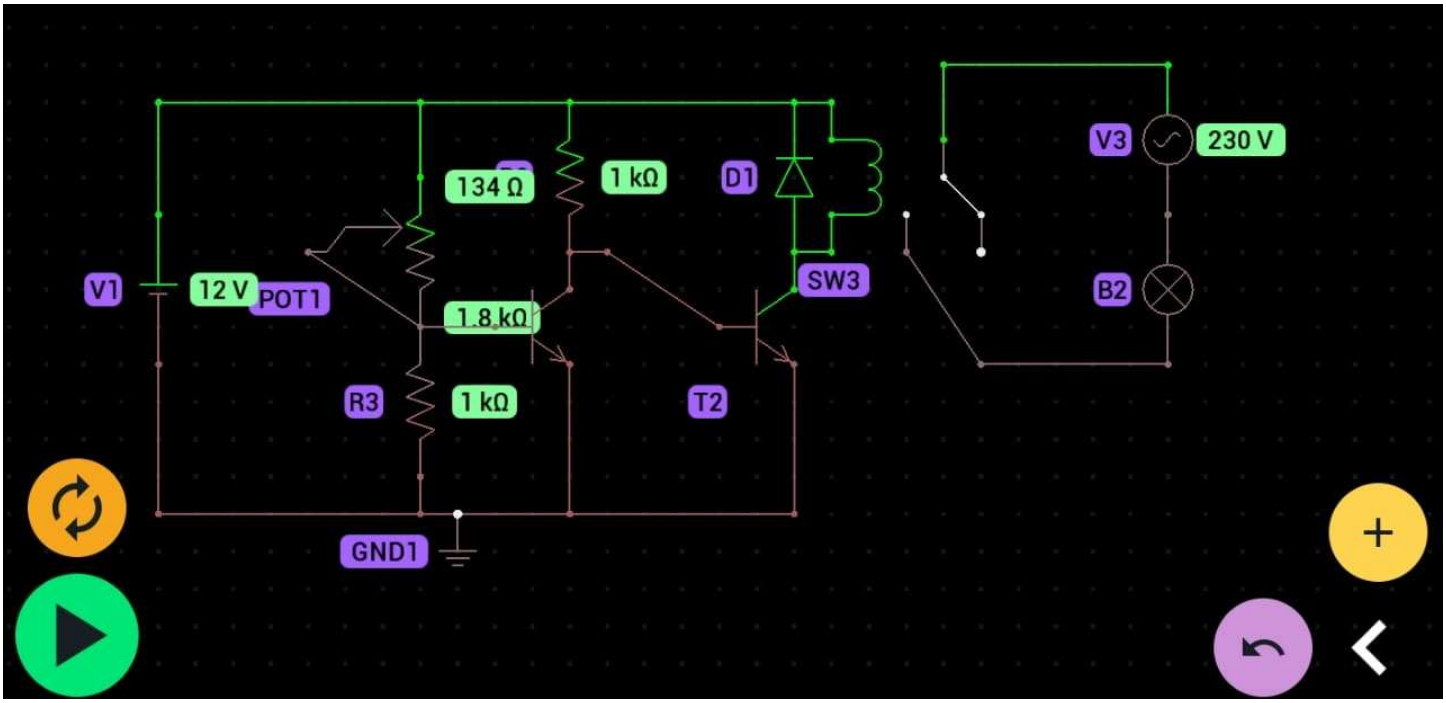
- Street lights
- Security lights
- Glow sign boards
- Doorway lighting and other places for automatic lighting.

OUTPUT:

ON CONDITION:



OFF CONDITION:



REFERENCES:

https://www.homemade-circuits.com/how-to-make-light-activated-day-night/