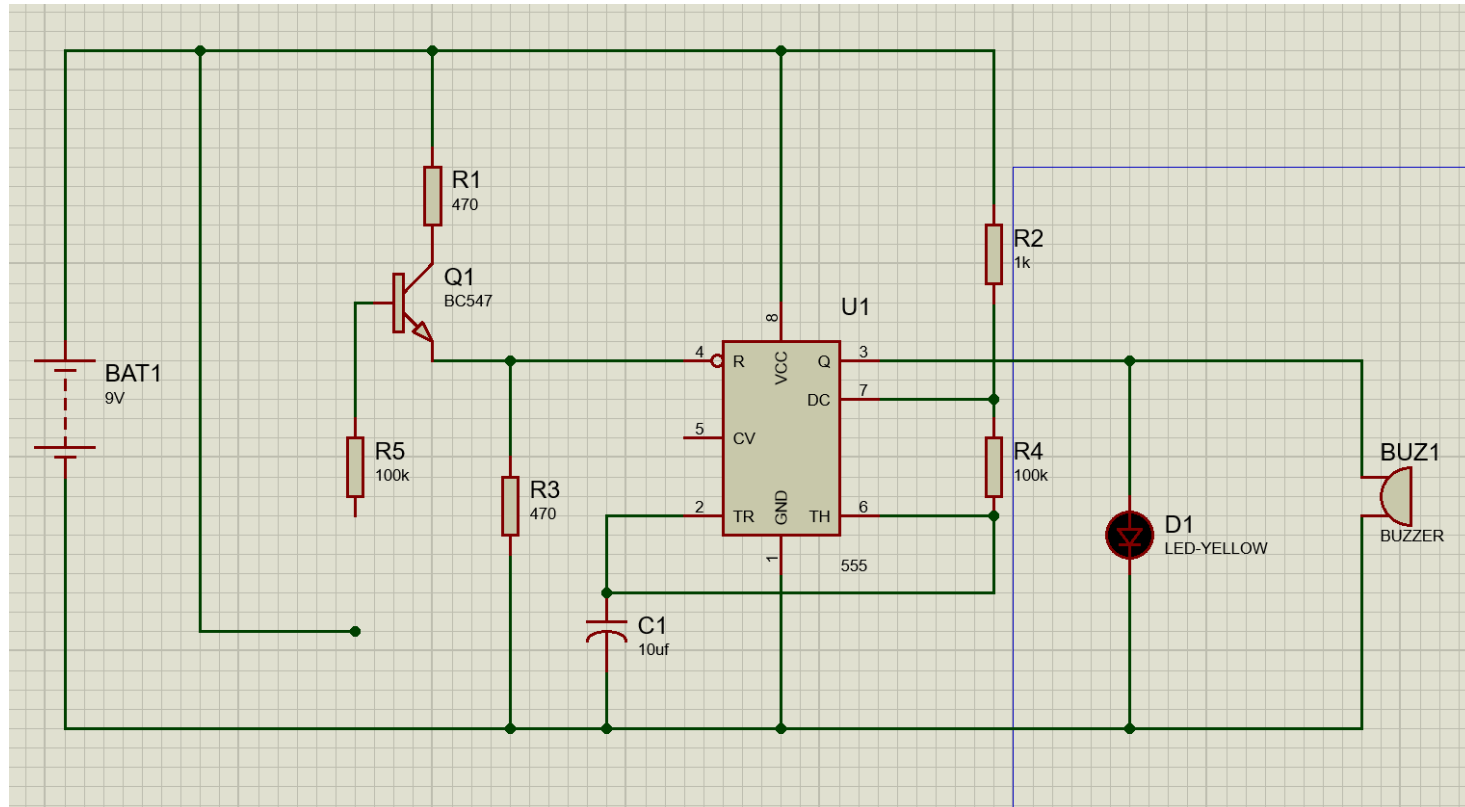


## Rain Alarm Using 555 Timer & Buzzer

This project's purpose is to detect rain/water. If water touches the sensor, the circuit will be closed which triggers the buzzer to sound an alarm and causes the LED to illuminate and start flashing. When there is no water, the resistance between the wires of the sensor is very high stopping any current from passing. However, water is a good conductor thus it provides an alternative pass allowing for the current to pass between the sensor's wires. The sensor should be exposed in an open area with an angle of 3 to 4 degrees. This will allow the water to stay for long enough to keep the

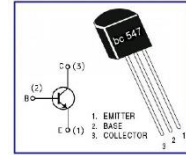








circuit going and for the water to get drained down so that water doesn't stay on the sensor even after the rain is over.

### Components: -

- 555 Timer IC – 1
- Buzzer – 1
- BC547 Transistor – 1
- Resistor 100KΩ – 2
- Resistor 10KΩ – 1
- Resistor 470Ω – 2
- Capacitor 10µF – 1

- Battery 9V –

Components	Description	Image
BC547 transistor	The BC548 is a general-purpose NPN bipolar junction transistor commonly used in European and American electronic equipment. It is notably often the first type of bipolar transistor hobbyists encounter and is often featured in designs in hobby electronics magazines where a general-purpose transistor is required.	
555 Timer IC	The 555 timer IC is an integrated circuit (chip) used in a variety of timer, pulse generation, and oscillator applications. The 555 can be used to provide time delays, as an oscillator, and as a flip-flop element	
Rain Sensor Module	The rain sensor module is an easy tool for rain detection. It can be used as a switch so that when a raindrop falls through the raining board and also for measuring rainfall intensity.	
Buzzer	A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.	
Electrical Resistance	A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses. Fixed resistors have resistances that only change slightly with temperature, time or operating voltage.	
CAPACITOR	A capacitor is a device that stores electrical energy in an electric field. It is a passive electronic component with two terminals. The effect of a capacitor is known as capacitance. While some capacitance exists between any two electrical conductors in proximity in a circuit, a capacitor is a component designed to add capacitance to a circuit. The capacitor was originally known as a condenser or condensate. This name and its cognates are still widely used in many languages, but rarely in English, one notable exception being condenser microphones, also called capacitor microphones	

Light-emitting Diode	<p>A light-emitting diode (LED) is a <b>semiconductor light source</b> that emits light when <b>current</b> flows through it. <b>Electrons</b> in the semiconductor recombine with <b>electron holes</b>, releasing energy in the form of <b>photons</b>. The colour of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the <b>band gap</b> of the semiconductor.</p>	
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### How it works

The 555 Timer is the main component of the circuit. In the diagram above, The 8<sup>th</sup> pin(VCC) is connected to positive of the battery and the 1<sup>st</sup> pin (GND) is connected to the negative. The buzzer is connected to the 3<sup>rd</sup> pin (Output) of 555 Timer, so it will produce sound depending on the output of the Timer. Resistor R2, R4, and the capacitor C1 will set the time period of the oscillations, the frequency of the flashing and peeping. The BC547 transistor is wired as a switch whose collector is connected to R1 which is connected to the VCC. R3 is connected to the emitter and R5 is the base resistor to the transistor Q1.

The output frequency =  $1.44/((R3 + 2 \times R4) \times C1)$

The buzzer is connected to the 4<sup>th</sup> pin (Reset). The buzzer will turn ON when the output of the 555 is HIGH and OFF when the output is LOW. The operation of the controlled by the status of the RESET pin (4<sup>th</sup>) which is connected to the transistor BC547. The 555 Timer will produce and output only when the RESET pin is HIGH.

The BC547 transistor Q1 is wired as a switch. When the transistor is ON, thus it will conduct current from the collector to emitter, so the voltage across R3 will be HIGH. But when the transistor is OFF, it won't conduct current from collector to emitter, thus the voltage across R3 will be LOW. When water is touched with both rain sensor terminals, current will flow into the base of the transistor via the current limiting base resistor R5. This turns the transistor ON and it conducts. This will make the RESET pin of 555 HIGH and it will start oscillations.