EAST WEST UNIVERSITY

Department of Computer Science and Engineering

PROJECT REPORT

Project title: Smart Gardening using BJT
Course: CSE251
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Project Name: Smart Gardening

Problem Statement:

Now-a-days, Dhaka city is the busiest city of our country. Time management is most complicated task for the people of it. On the other hand, Trees are important as well as gardening is. Time management for gardening is most critical thing. So, we just want to deal with the problem of time management for gardening. We designed a circuit system for automatically watering those plants. We will handle this circuit by using Bipolar Junction Transistor (BJT).

Design:

*Equipment:

1. BJT (Op-Amp)
2. Relay
3. Diode
4. Breadboard
5. Battery
6. Motor
7. Solar Panel
8. A pot and a plant

Circuit Diagram:

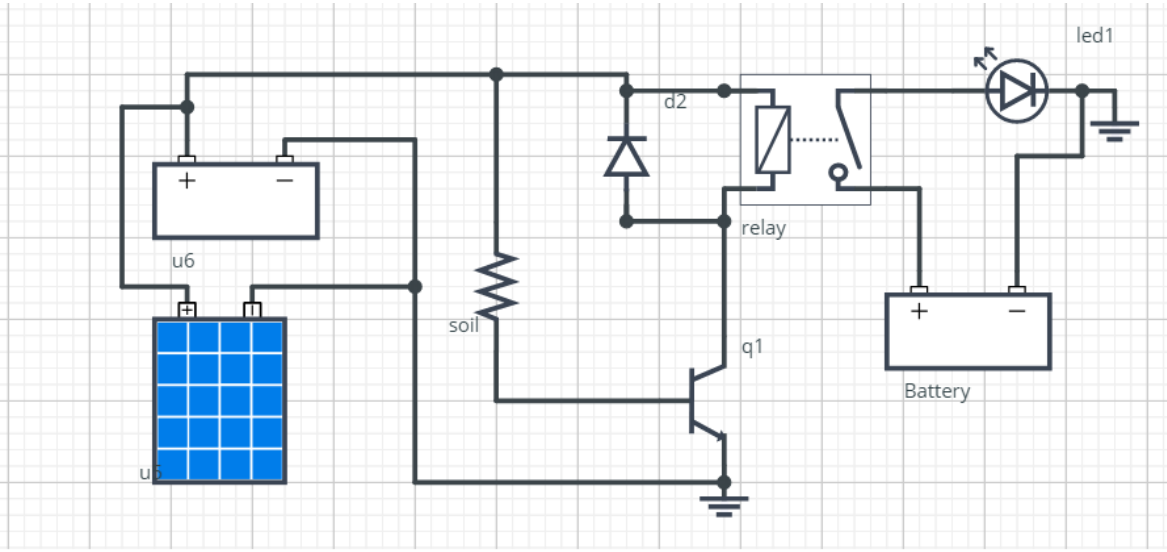
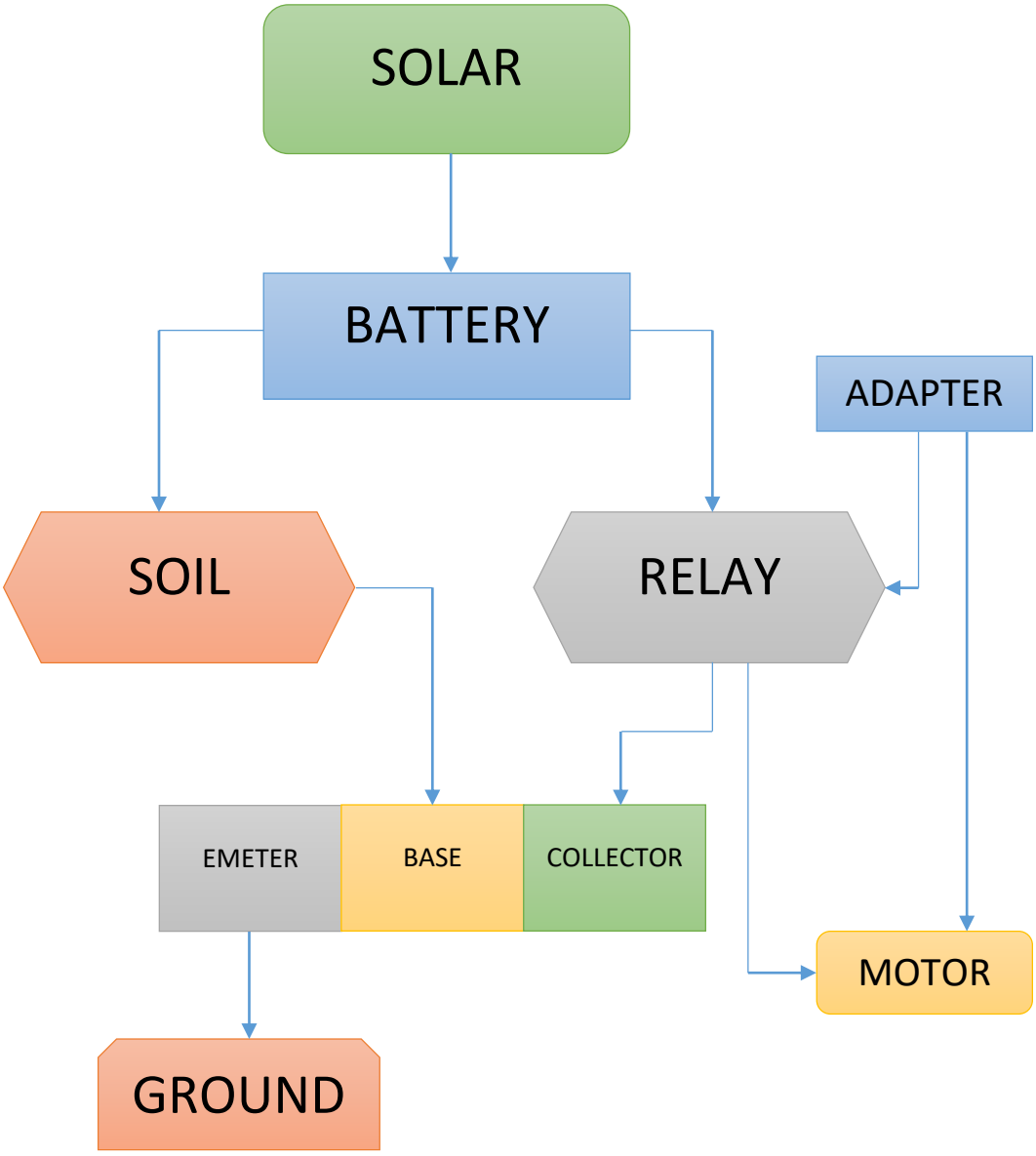


Figure: Full circuit design for Smart Gardening using BJT.

Working Process of the Circuit:

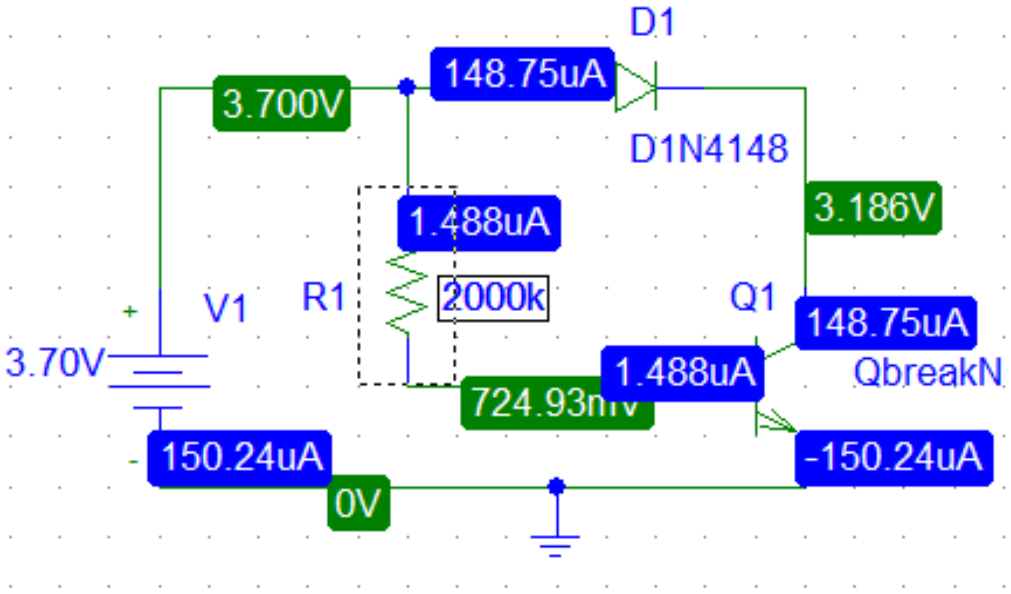


Explanation:

Solar will charge the battery and battery positive part will connected to soil and Relay. Relay is connected to collector. When the soil is dry then the voltage of base is zero (0); due to infinity resistance. When the soil become wet then the base got voltage and current can flow from collector to Emeter. Due to this process current will also flow to relay; thus relay will get a signal and turn off the motor.

Results:

Simulation:



Experimental:

Transistor	V_B	V_C	Explanation
On	0.82	0.09	In dry soil the resistance is almost equal to infinity. But the resistance in wet soil is less (0.32 MΩ) than infinity. So we will get a voltage in transistor Base (0.82V) and so in calculator (0.09V). That will give signal to relay, thus motor will shut down.
Off	0.65	3.9	Due to high resistance, circuit is open due to that there is a little voltage (near 0V) in Base. As this become an open circuit and relay has no voltage drop; so collector got the full voltage from battery.

Real Life Implication:

There is no planet B. We have to plant trees and help the nature to hold our earth up. But as a human being we are busy enough for our livelihood. So, smart gardening is mandatory. By our project trees will not remain waterless and soil will not be dry enough. But there is a thing, in our country-electricity is a huge problem for power up the whole system. There is not flawless electricity supply that's why we have to use solar panel for power up the system. This solar will help us to supply water to the trees even the electricity is not available for a while.

Discussion:

Basically solar will help us for getting flawless electricity supply. It will help also for reduction of cost. We are expecting to remove the random power supply from switch board for power up our motor with another solar panel. We can use 9V/12V rechargeable battery for replacing the nominal power adapter. This rechargeable battery will charged by our solar. In future we will think about a single power supply for power up the whole system.

Limitation:

1. For power up the motor, still we have to use AC power supply.
2. The motor cannot turn on until the soil become full dry.
3. This project will measure the soil of only one plant and watering all plants in case of a big garden.