Self Blooming Night Flower

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SYNOPSIS

Decorations are an essential part of a festival especially in India where we celebrate festivals like Diwali. We wanted to take these decorations one step ahead by using automation, and so we present to you a self blooming flower that will automatically light up as soon as it senses the darkness around it. We propose to develop a self blooming flower that consists of Arduino nano, servo motor, and light-dependent resistors (LDRs). The main component of this flower is Arduino nano which is programmed to detect the amount of light present in the flower's surroundings and using this data will rotate the servo motors for opening and closing of the flower. As the sun sets, these flowers on their own will light up to add a charm to the festival and make it more memorable than before.

Keywords

Arduino NANO, servo motor, light-dependent resistors (LDRs).

MOTIVATION

It might sound surprising but the idea to make this project came from 'Water Lily'. Just as a Water Lily blooms at night we decided to make an artificial flower working on the same principle and then we realised that this artificial flower can be used as a decorative item in many festivals such as Diwali, Christmas and many more.

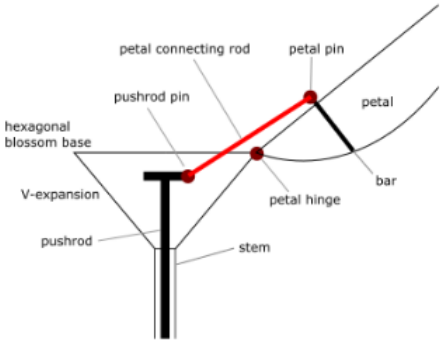
PROJECT DESCRIPTION

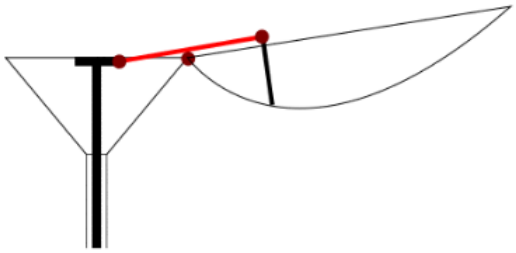
The various components that will be used in our project are as follows:

1. **LDR processing circuit**
   This circuit is used as a voltage divider and amplifier to get corresponding voltages for each LDR. When high intensity light falls on the LDR, its resistance is low, and thus the output is high. Similarly, when low intensity light falls on the LDR, its resistance is high, and thus the output is low.

2. **Arduino NANO used as ADC Convertor**
   The voltages due to LDRs will be sent to Arduino through the analog input in order to convert them into digital values between 0 to 1023 so that further instructions can be given to the servo motor and LEDs digitally to conduct the blooming process.

3. **Petals Mechanism**
   Below is an image of how the pushrod moves with petals. As the pushrod moves up it pushes the connecting rod and petals down. As it moves down it drags connecting rods and petals are being closed.

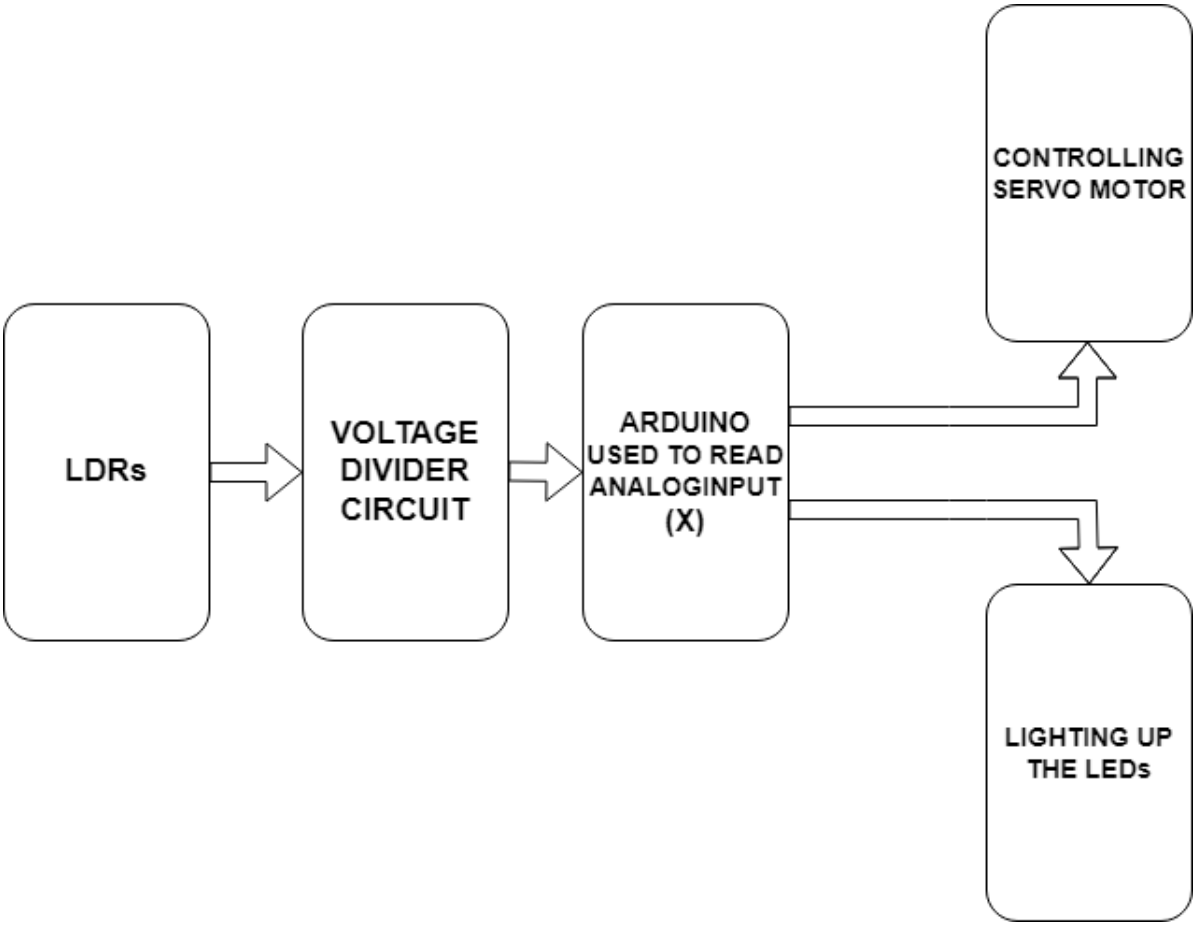




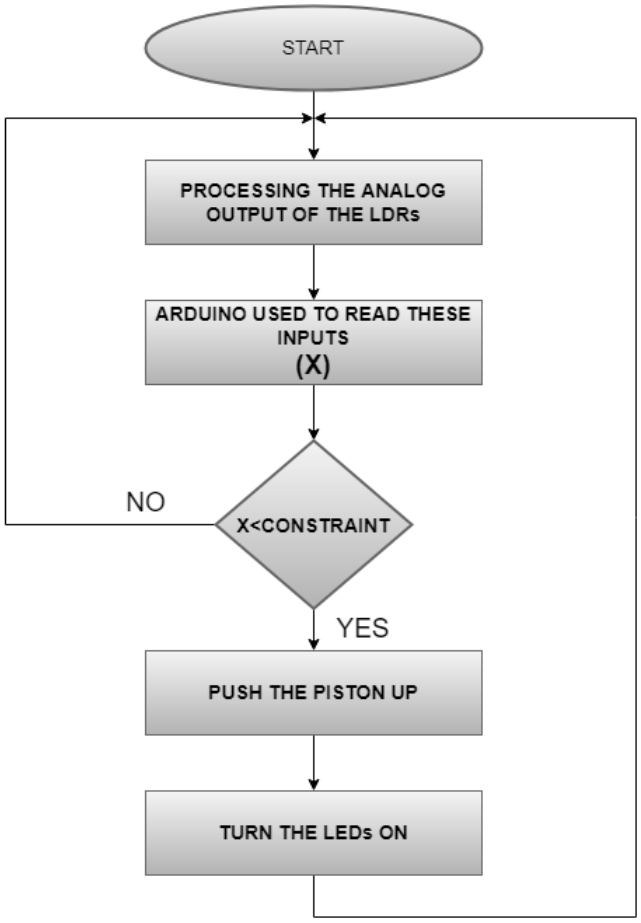
4. **Servo Motors**
   A servo motor is used to control the movement of the piston in both upward and downward direction to make it appear like a blooming process.

5. **LEDs**
   The LEDs light up as soon as the flower starts blooming in the dark.

BLOCK DIAGRAM



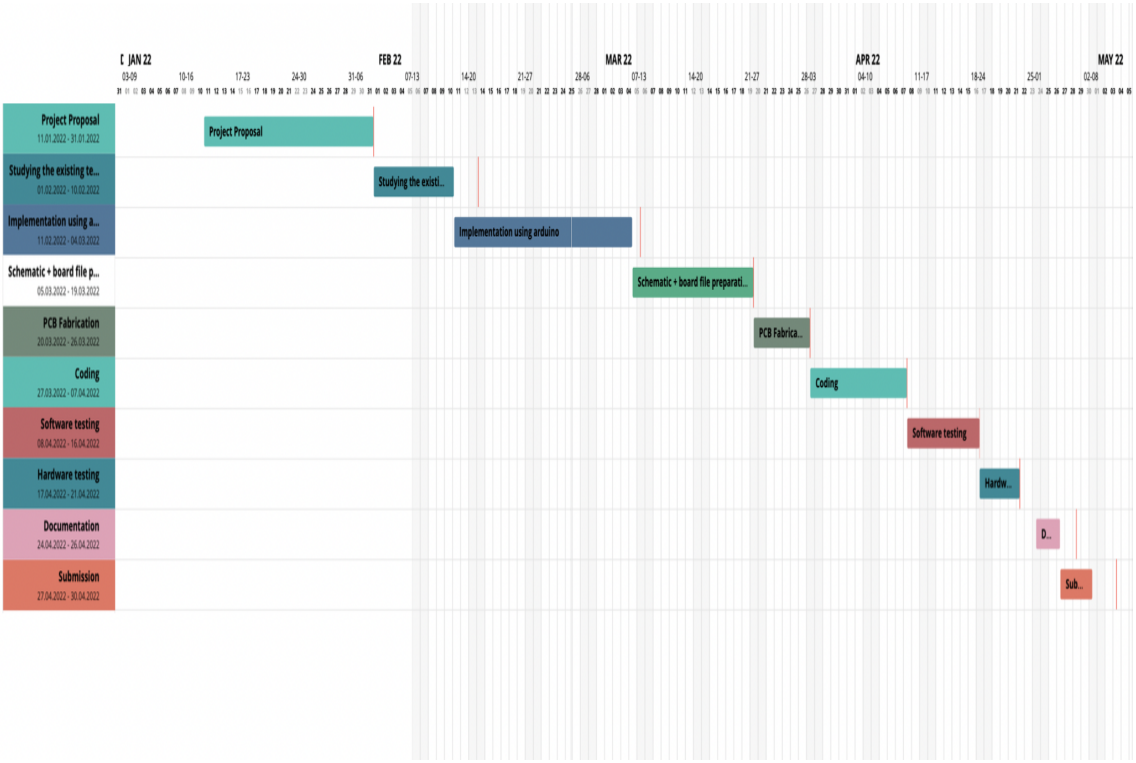
FLOWCHART


START
PROCESSING THE ANALOG OUTPUT OF THE LDRs
ARDUINO USED TO READ THESE INPUTS
(X)
X<CONSTRAINT
NO
YES
PUSH THE PISTON UP
TURN THE LEDs ON

BILL OF MATERIALS

COMPONENT	QUANTITY
ARDUINO NANO R3	1
NEO PIXEL LEDS	5
SG-90 SERVO MOTOR	1
RESISTOR	X
LDR	4

GANTT CHART


JAN 22
FEB 22
MAR 22
APR 22
MAY 22
Project Proposal
11.01.2022 - 31.01.2022
Studying the existing te...
01.02.2022 - 10.02.2022
Implementation using a...
11.02.2022 - 04.03.2022
Schematic + board file p...
05.03.2022 - 19.03.2022
PCB Fabrication
20.03.2022 - 26.03.2022
Coding
27.03.2022 - 07.04.2022
Software testing
08.04.2022 - 16.04.2022
Hardware testing
17.04.2022 - 21.04.2022
Documentation
24.04.2022 - 26.04.2022
Submission
27.04.2022 - 30.04.2022
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Hardw...
D...
Sub...