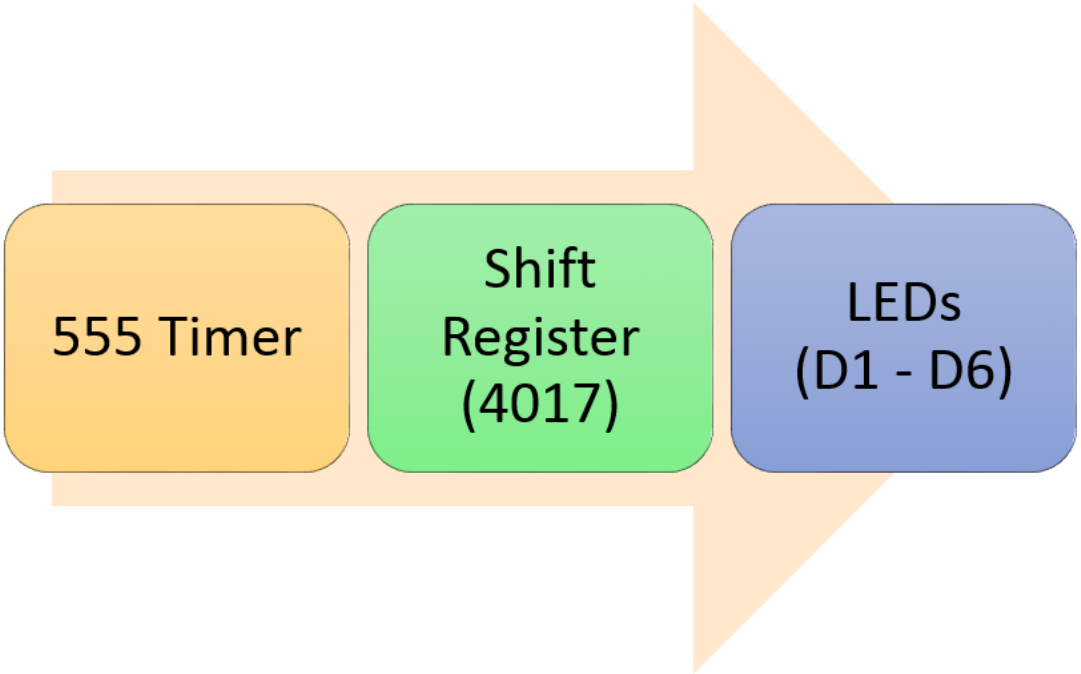
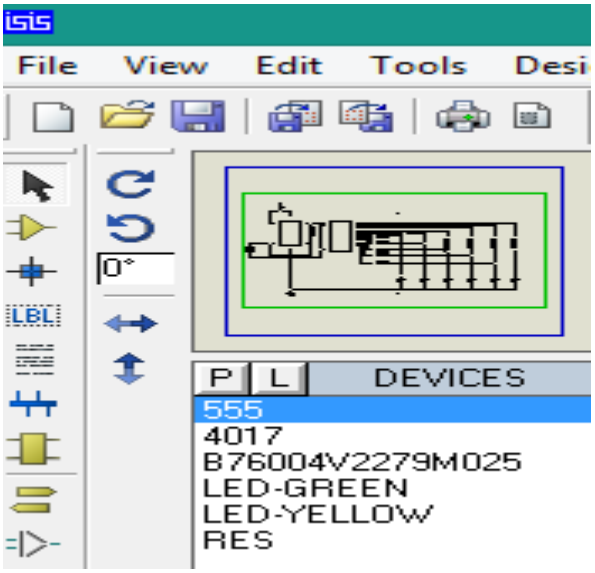
Sequential LED Blinking using 555 Timer in Proteus ISIS

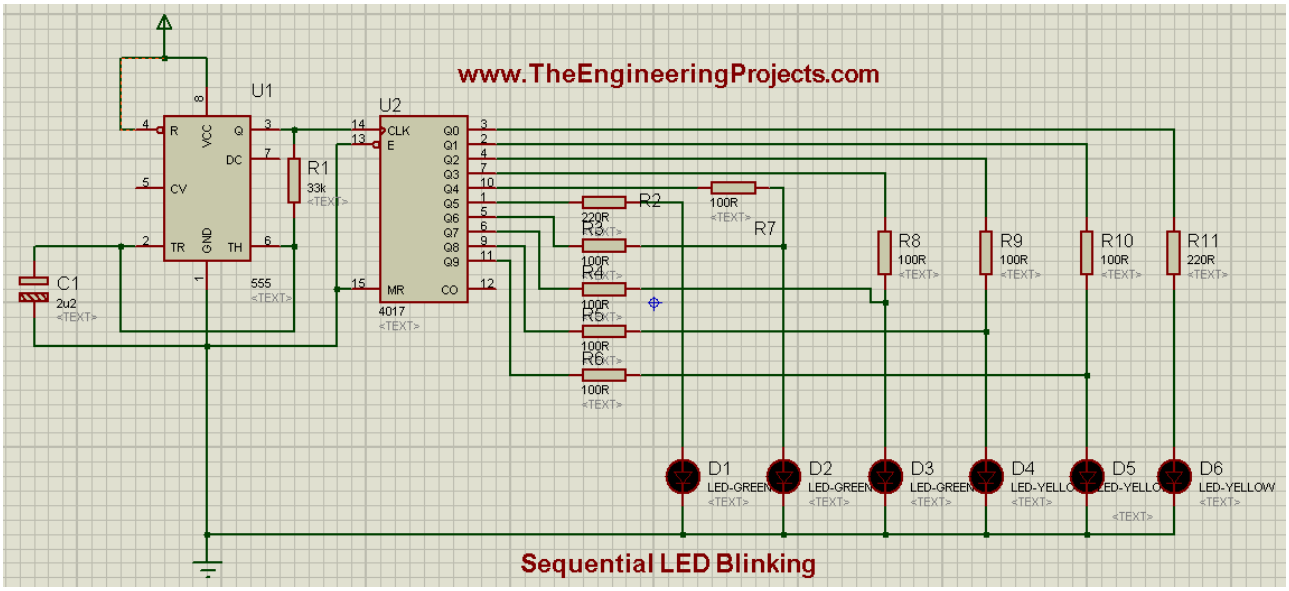
- Threshold voltage for 555 Timer is 5 volts, and when voltages exceeds this level, 555 timer triggers and it generates a output pulse at its output pin which is ‘Q’ pin.
- While designing the circuit, First of all 555 Timer will come, secondly Shift Register (4017) will be connected with it and at the end we will plug LED’s. The complete circuit flow diagram is shown in figure below:



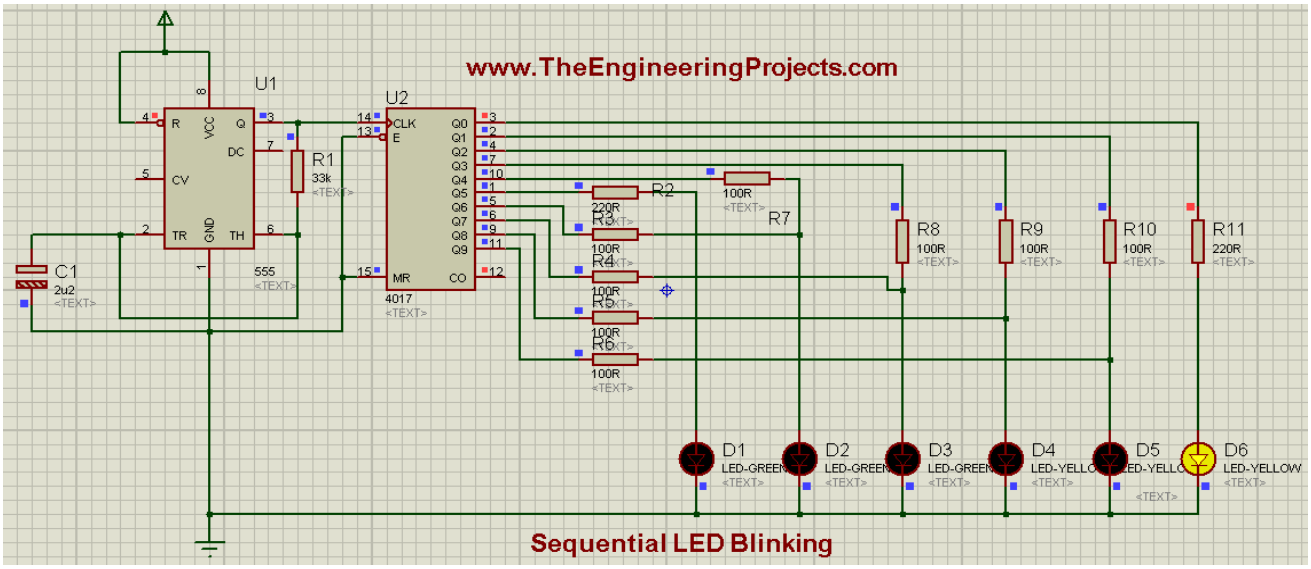
- Now coming towards the designing of the project, first of all, place the components in your Proteus workspace, as shown below in image:



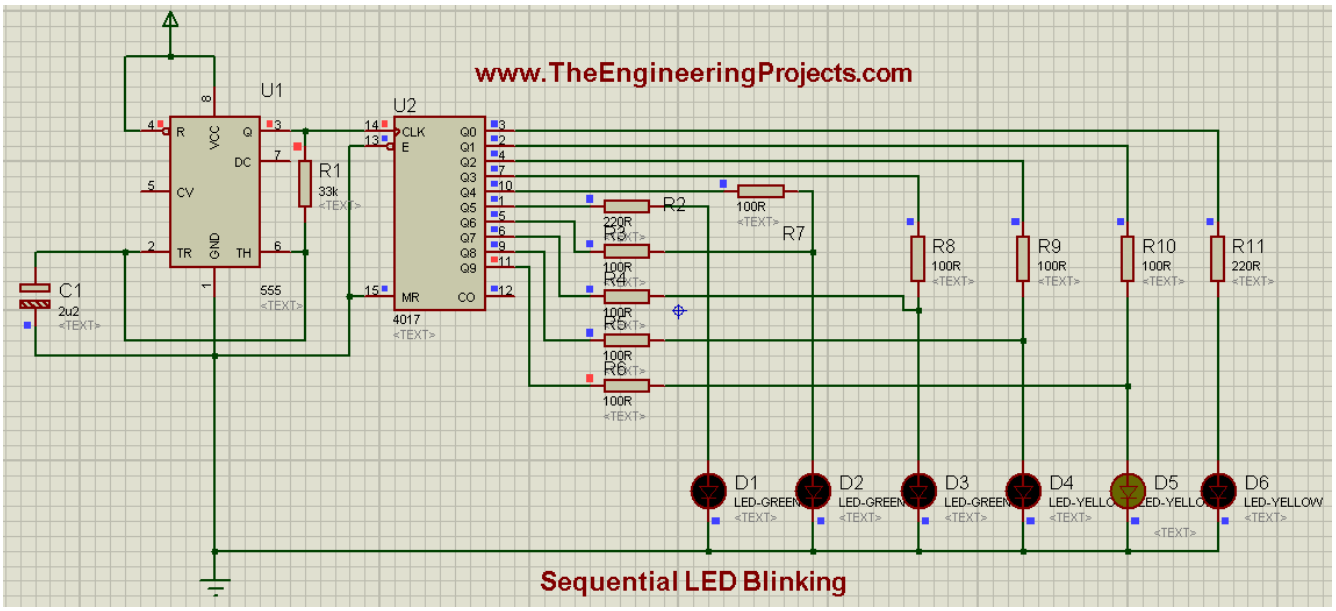
- Now Output pulse from 555 Timer is connected to input ‘CLK’ pin of Shift Register.
- Since the register being used is 10-bit, and its outputs are Q0~Q9. The pins Q0~Q5 are connected to LED’s D6~D1 respectively.
- After that Register output pin Q6 is also connected to LED (D2) and it becomes parallel with Q4. Now LED, (D2) has 2 parallel inputs and it becomes HIGH (turns ON) if any of the two Inputs is HIGH.
- Next we connect the Register output pin Q7 to LED (D3) and then it becomes in parallel with Q3. After doing that LED, (D3) has 2 parallel inputs and it becomes HIGH, if any of the 2 inputs is HIGH.
- After doing that, now we connect register’s output pin (Q8) to LED (D4) and then it also becomes in parallel with Q2, and LED will start glowing if any of the 2 inputs will be HIGH.
- Now at the end, we connect Q9 to LED (D5), and then it becomes in parallel with Q1. Now D5 has 2 inputs (Q9 &Q1) and LED will glow if any of the 2 inputs will be HIGH.
- Now at the end, If you have connected all the components in exact order, and all the connections are OK then, the exact simulation will look like as shown below:



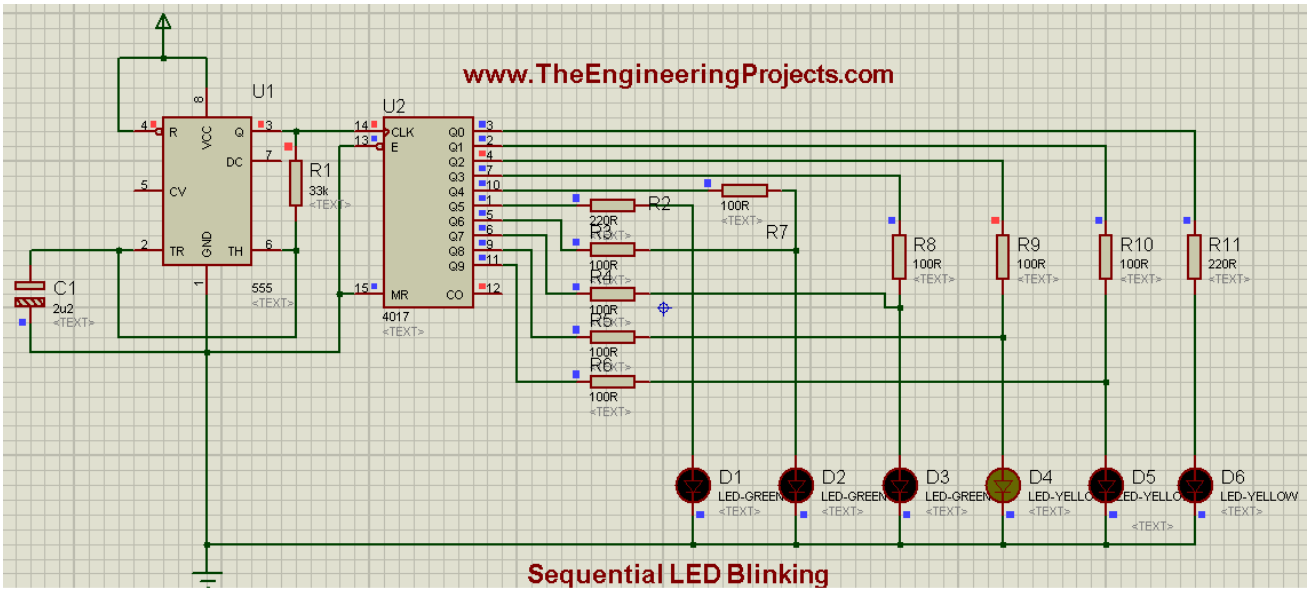
- Now if we run the Proteus simulation and observe it closely, then we will see that, 555 Timer is continuously generating PWM and the Shift Register set’s its output ports HIGH from Q0~Q9 respectively.
- First of all Register’s output pin # Q0 becomes HIGH and it send signal to LED (D6) and LED will start glowing. You can also observe this phenomenon in the image given below:



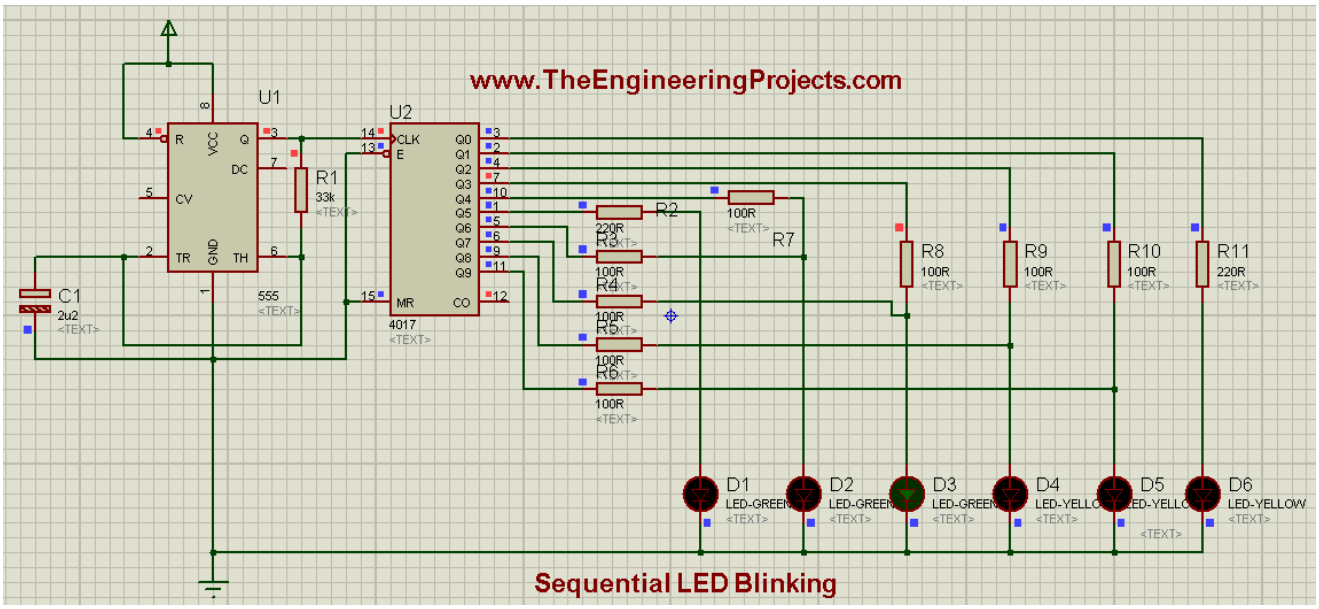
- Then pin # Q1 becomes HIGH and it send signal to LED (D5) and D5 starts glowing. This can be observed in the figure given below:



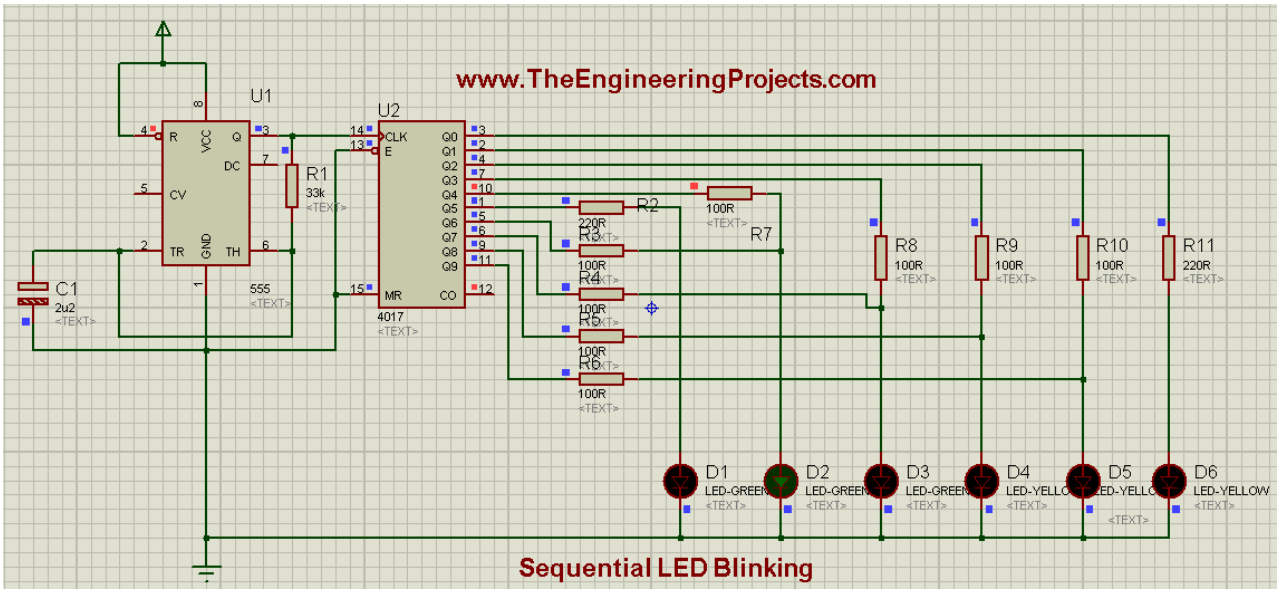
- Then register's output pin Q2 becomes HIGH and sends signal to LED (D4) and D4 starts glowing. This can also be observed in the figure given below:



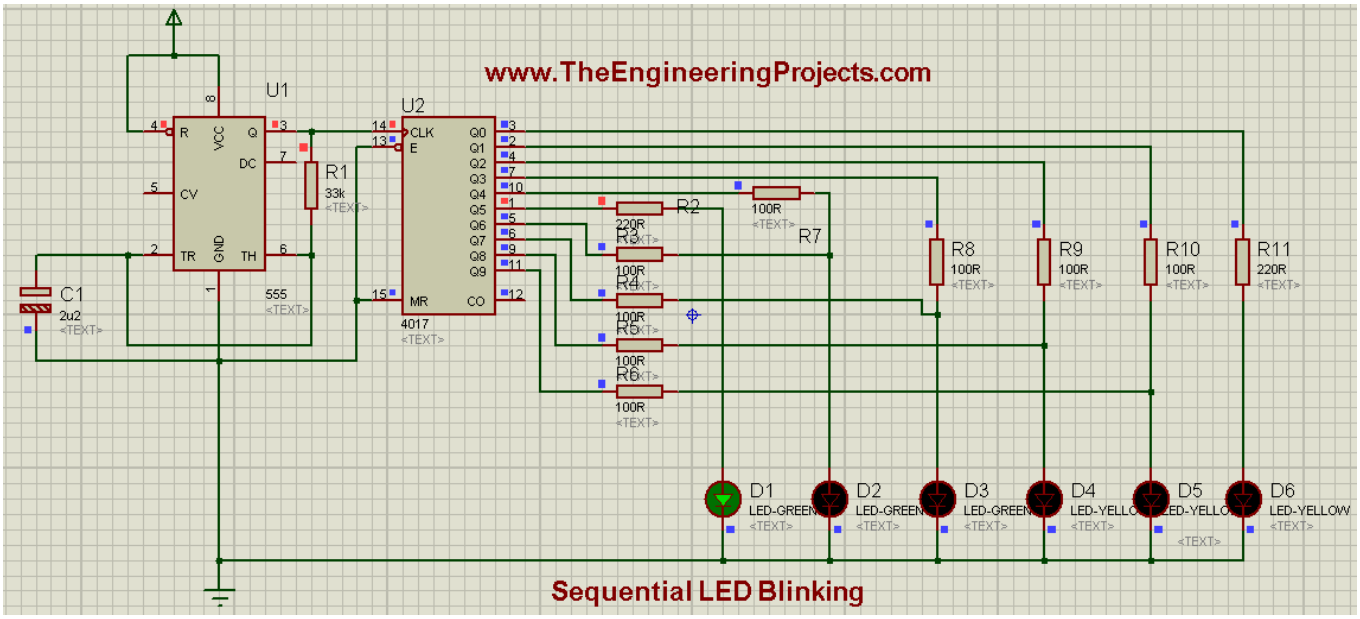
- Then Register's output pin Q3 becomes HIGH and send signal to LED (D3) and this LED starts glowing. This stage can be seen in the figure given below:



- Then Register's pin Q4 becomes HIGH and sends signal to LED (D2) and this LED (D2) starts glowing. This process is shown in the image given below:



- And in the next step, Register gets its pin # Q5 HIGH and send signal to LED (D1) starts to glow. This process can be seen in this figure:



- This process keeps on going and when the Register;s next pin becomes HIGH, which is Q6, then it again sends signal to LED (D2) and it starts to glow, and so D3,D4,D5 will glow respectively, and this sequence of LED's blinking will continue, until you stop it manually or by yourself.
- In the beginning, when LED's Started to blink from Left to Right which was (D6 to D1) , this sequence is called Forward Sequence.
- After that, LED's started to blink from Right to Left which was (D1 to D6), this sequence is called Reverse or Backward Sequence.
- We can summarize this whole sequence into a tabular shape, and this table is given in the figure below:

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Register's Output at pin #	Corresponding LED Blinking
Q0	D6
Q1	D5
Q2	D4
Q3	D3
Q4	D2
Q5	D1
Q6	D2
Q7	D3
Q8	D4
Q9	D5

Sequential LED Blinking Pattern

- This process keeps on going and LED's keeps on glowing in a beautiful sequence. These type of projects are generally used for decoration purposes.

Alright friends, that's all from this post. I hope today, you people have learn something new and informative. In the coming tutorials, we will discuss something new regarding 555 Timer applications. Until than, Take Care and Be Safe !!!