



# **INNOVATIVE PROPOSAL** **ANALOG ELECTRONICS**

Under Prof. Pragati kumar

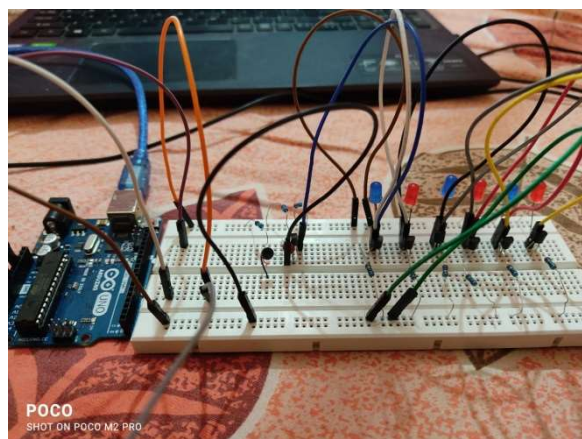
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## **TITLE**

### **LED MUSIC RHYTHM**

(Live Video Demostration and explain the circuit)



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## **OBJECTIVE**

we have built [Dancing LEDs](#), which just follow a set pattern and we can only control the speed. Now we are taking this to next level, i.e. Music Operated Dancing LEDs, in which LEDs will flash according to music, just like Disco light, as discussed above. This Musical LEDs circuit is based on transistor BC547

## **INTRODUCTION**

You must have seen the Disco Lights or DJ lights, which Turn ON and OFF according to the beats of the music. These lights glow according to the length and pitch (volume) of music beats, basically these are designed to pick the high intensity sound like Bass sound. So these lights follow the high pitch beats in music like drum beats, and Turn ON and OFF according to music pattern.

However the sensitivity of the circuit can be increased to pick the low notes too.

## **COMPONENTS WE USED:**

- Condenser Mic
- 5- NPN Transistor BC547
- Resistors- 10k (2), 1k (4), 1M (1)

- **Ceramic Capacitor 100nF**
- **Arduino for Power Supply**
- **4 – LEDs**
- **Breadboard and connecting wires**

## **Jumper**

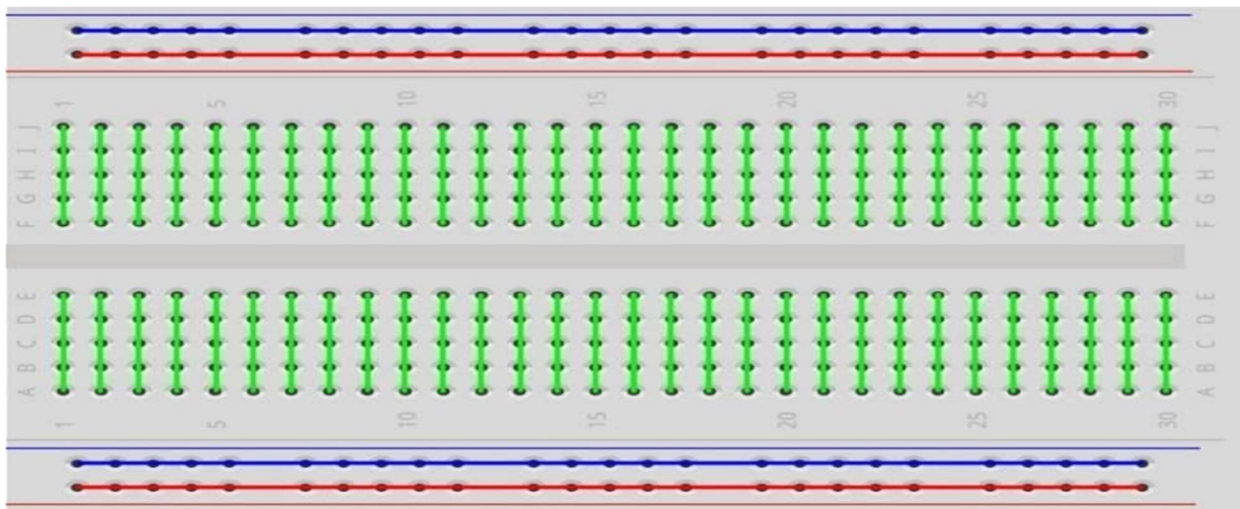
A jump wire (also known as jumper wire, or jumper) is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit



## **Breadboard**

Breadboards are used to help you connect components to complete your basic circuit. The reason it's called breadboard dates back to when electronics components were much bigger and people would actually use wooden

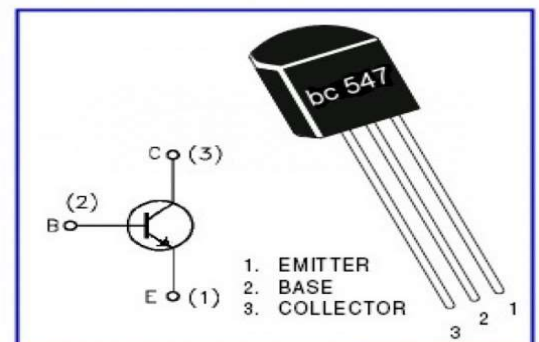
**breadboards (boards used to cut bread) to connect electronic circuits.**



### **Transistor(BC547)**

**A transistor is basically an electrically controlled switch.**

**The BC547 is a NPN transistor meaning when power is applied to the base (control pin) it will flow from the collector to the emitter. Typically NPN transistors are used to “switch ground” on a device, meaning, they are placed after the load in a circuit.**



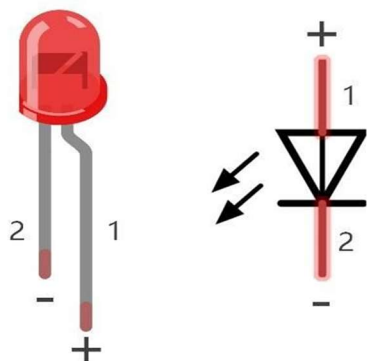
### **Condenser Mic**

**Condenser mics get their name from the “capacitor” inside that converts**



acoustic energy into an electrical signal (“condenser” is an old term for “capacitor”). The capacitor in a studio condenser microphone consists of two metal-surfaced plates suspended in very close proximity to each other with a voltage across them.

## LED



LED is a kind of diode. LED will shine only if the long pin of LED is connected to the positive electrode and the short pin is connected to negative electrode.

This is also the features of the common diode. Diode works only if the voltage of its positive electrode is higher than its negative electrode

## Working Explanation:

In this Simple LED Music Light Circuit, condenser mic picks up the sound signals and converts them into voltage levels. These voltage signals are further fed into R-C filter or HIGH PASS filter (R2 and C1), to eliminate the noise from the sound. Further a NPN transistor (BC547) is used to amplify the signals, from the High Pass filter. Then finally these music signals are given to the array of four

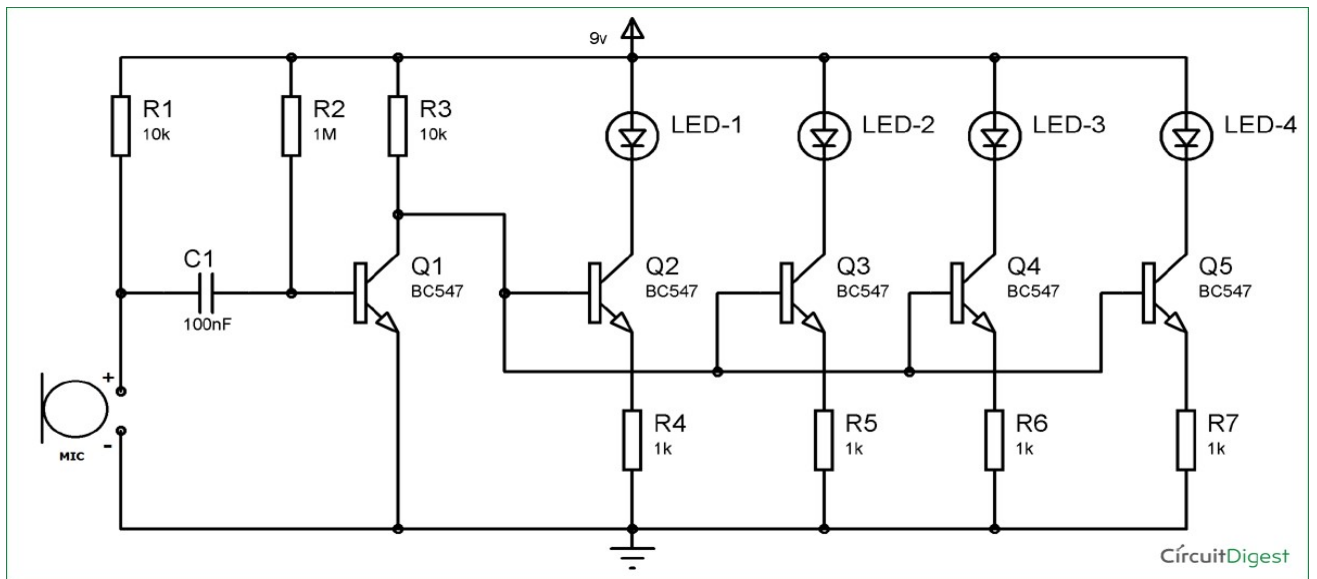
transistors. Transistor in this array works as amplifier, and glows the four LEDs according to the sound pattern. This generates a very interesting sequence of dancing LEDs which follows the beats as per their intensity or pitch. We can also add more LEDs with transistor to make it cooler.

We can adjust the sensitivity of MIC by changing the value of R2 and C1, by using the formula for R-C filter:

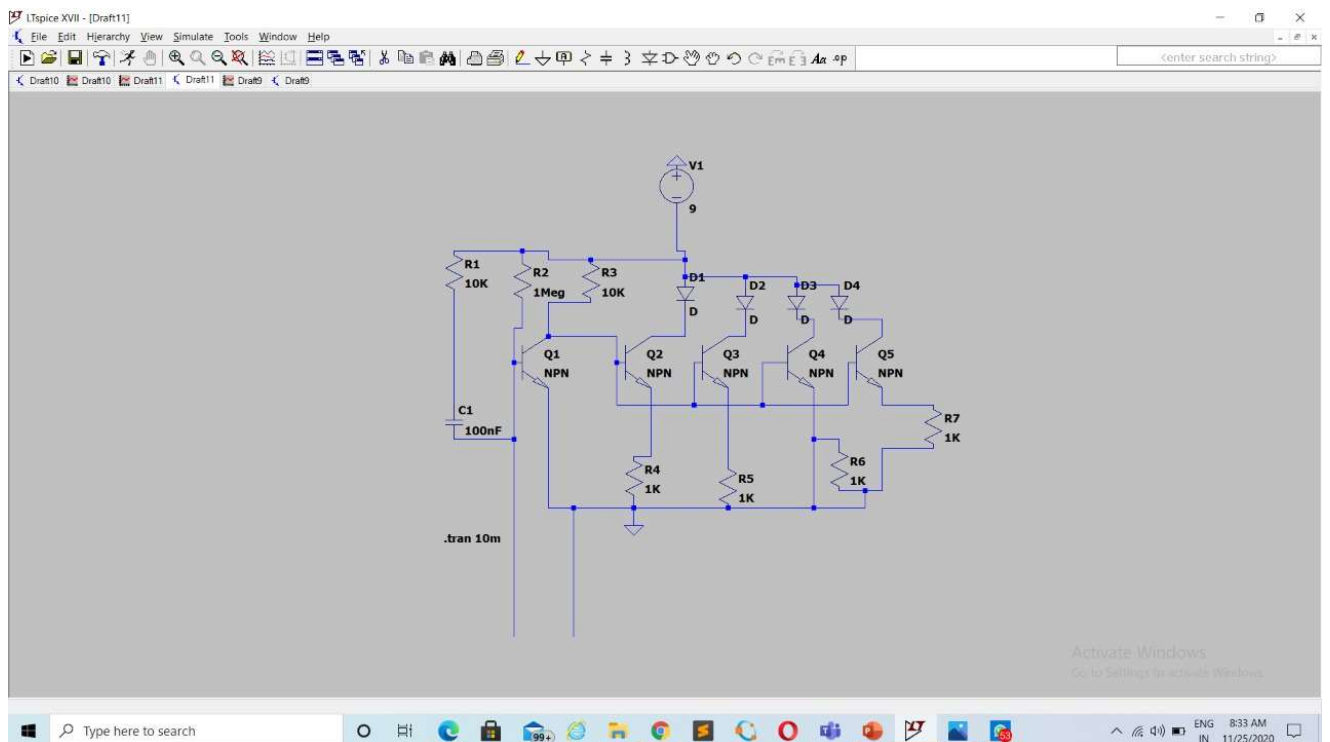
$$F=1/(2\pi RC)$$

F is the cut off frequency, means filter only allow frequency above than F. It can be easily deduced that more the value of RC, less the cut off frequency and higher the sensitivity of MIC. And higher the sensitive of circuit means MIC can pick low volume sounds, hence LEDs can glow on low pitch music also. So by adjusting its sensitivity we can make it less sensitive to reacts only on high note beats or we can also make it more sensitive to react on every little beat in the music. Here we have set its sensitivity at moderate level.

## Music RhythmCircuit

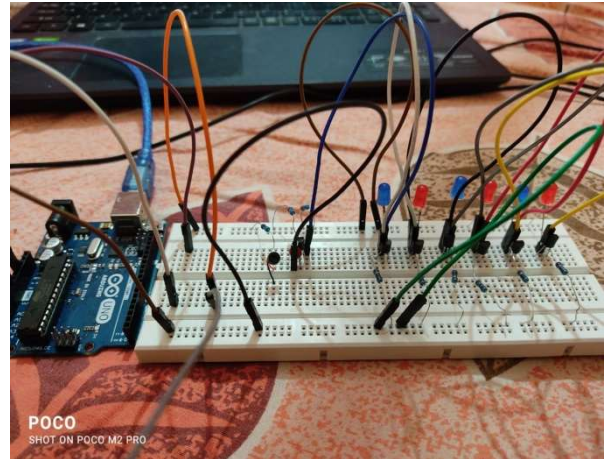
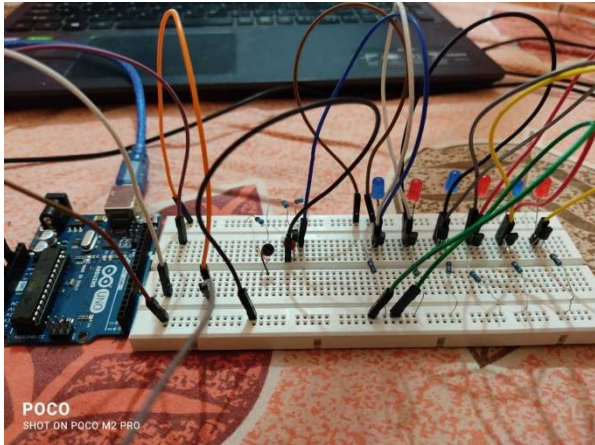


# LITSPICE CIRCUIT



# Self Made Pictures





### Conclusion:

**WE GOT SUCCESS TO MADE THIS LED MUSIC RHYTHM ANS WE ARE ABLE TO CHANGE THE SENSITIVITY OF THE CONDENSOR MIC BY CHANGING THE VALUE OF CAPACITOR ANS RESISTANCE**

**Link of the video which we made at Home Given Below:-**

<https://drive.google.com/file/d/1e0D8UfXq-VfyPKwqufwzM04QQjn0E-OH/view?usp=sharing>

<https://drive.google.com/file/d/1I7dxLWq0frwrIvmHpjpbipKT0QAqTX8w/view?usp=sharing>

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