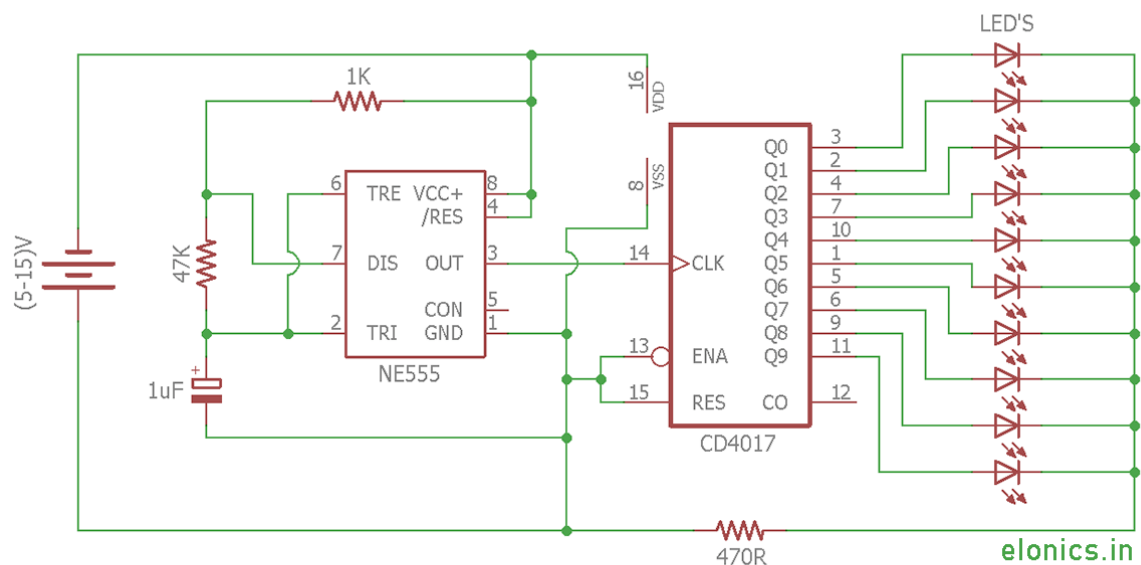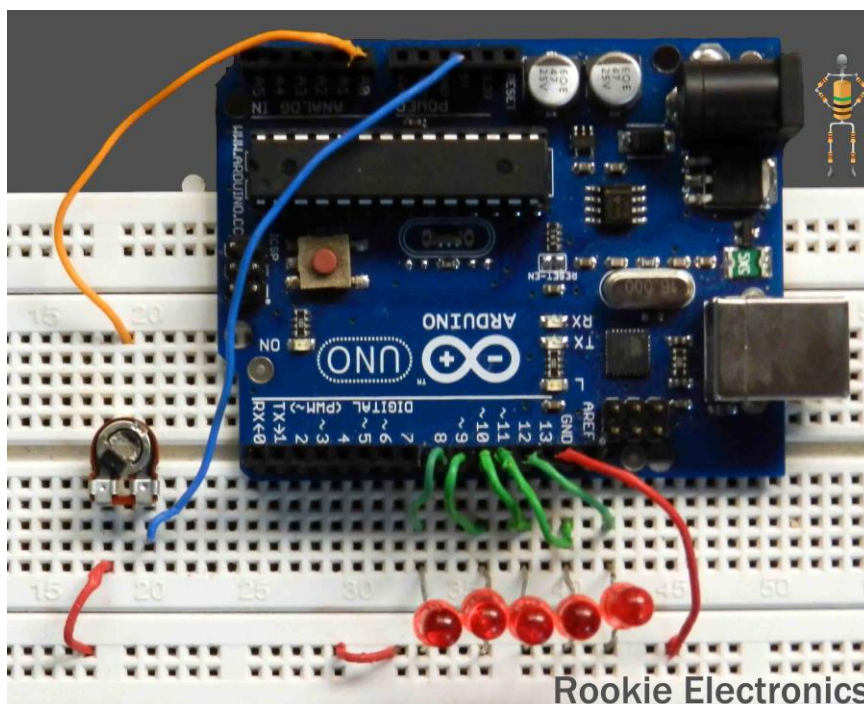# Circuit:

LED CHASER SCHEMATIC

Rookie Electronics

Theory:

Throughout the duration of the planning period, I considered several circuit ideas, these being; a DC motor control circuit, a shadow detector alarm circuit, a light sensor circuit, a clap switch circuit, and finally, an LED chaser circuit. From all of these ideas, I decided the LED chaser circuit was the best choice, as it was simple to follow, easy to understand, and overall, it interested me the most. The

circuit itself is a sequential circuit in which, the LEDs light up one after the other, thus the depiction of it being a sequential circuit.

Working &Concept:

Purpose and working of the circuit As mentioned before, the circuit will incorporate a mixture of discrete and integrated components, these of which will light up each LED, one after the other. All this is possible using the following circuit.

OBSERVATION:

As you can see from the schematic above, the circuit will make use of: a 555 timer chip, a 4017 counter chip, and finally, an R-C network. From the information given on the two integrated circuits we are using in this circuit, we will not piece together the entire circuit and explain how it all works.

As we can see, the circuit is powered by a 9V battery supply. From this 9V battery supply, it will give power to the two integrated circuits through the relevant pins (as mentioned previously). The timing aspect of the circuit for the 555 timer chip will be made possible through the two resistors and the capacitor.The output will be high. When the output is high, it will activate the count on the 4017 decade counter in which it will produce an output on the corresponding output pin. The first output to turn on will be output 0. As the count continues, it will continue in sequence through each output until it resets. The output in this circuit will be in the form of an LED lighting up.

As there is a constant fluctuation of voltage, and therefore current in the ICs. We will need to stabilize any voltage spikes through the means of a low value capacitor across the voltage supply. The capacitor will be of capacitance, 0.1μF.

Precautions:

When the circuit is to be build or tested, I will need to ensure that: -

*The area is well lit and clear of debris. – There isn't any volatile or flammable substances within the vicinity. –

*The battery is kept away from a heat source, as this will result in severe injury. –

*Liquids are to be kept away from the work area, as this will also result in injury

Code:

```
int delayTime = 0;
void setup()
{
  pinMode(8, OUTPUT);
```

```
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(11, OUTPUT);
  pinMode(12, OUTPUT);
}
void loop()      //this means Perform functions again and again
{
  delayTime = analogRead(0);            //0 means Analog Input A0

  digitalWrite(8, HIGH);   delay(delayTime);
  digitalWrite(8, LOW);    delay(delayTime);
  digitalWrite(9, HIGH);   delay(delayTime);
  digitalWrite(9, LOW);    delay(delayTime);
  digitalWrite(10, HIGH);  delay(delayTime);
  digitalWrite(10, LOW);  delay(delayTime);
  digitalWrite(11, HIGH);  delay(delayTime);
  digitalWrite(11, LOW);  delay(delayTime);
  digitalWrite(12, HIGH);  delay(delayTime);
  digitalWrite(12, LOW);  delay(delayTime);
}
```