

EXPERIMENT 2

LED chaser light

CIRCUIT DIAGRAM:

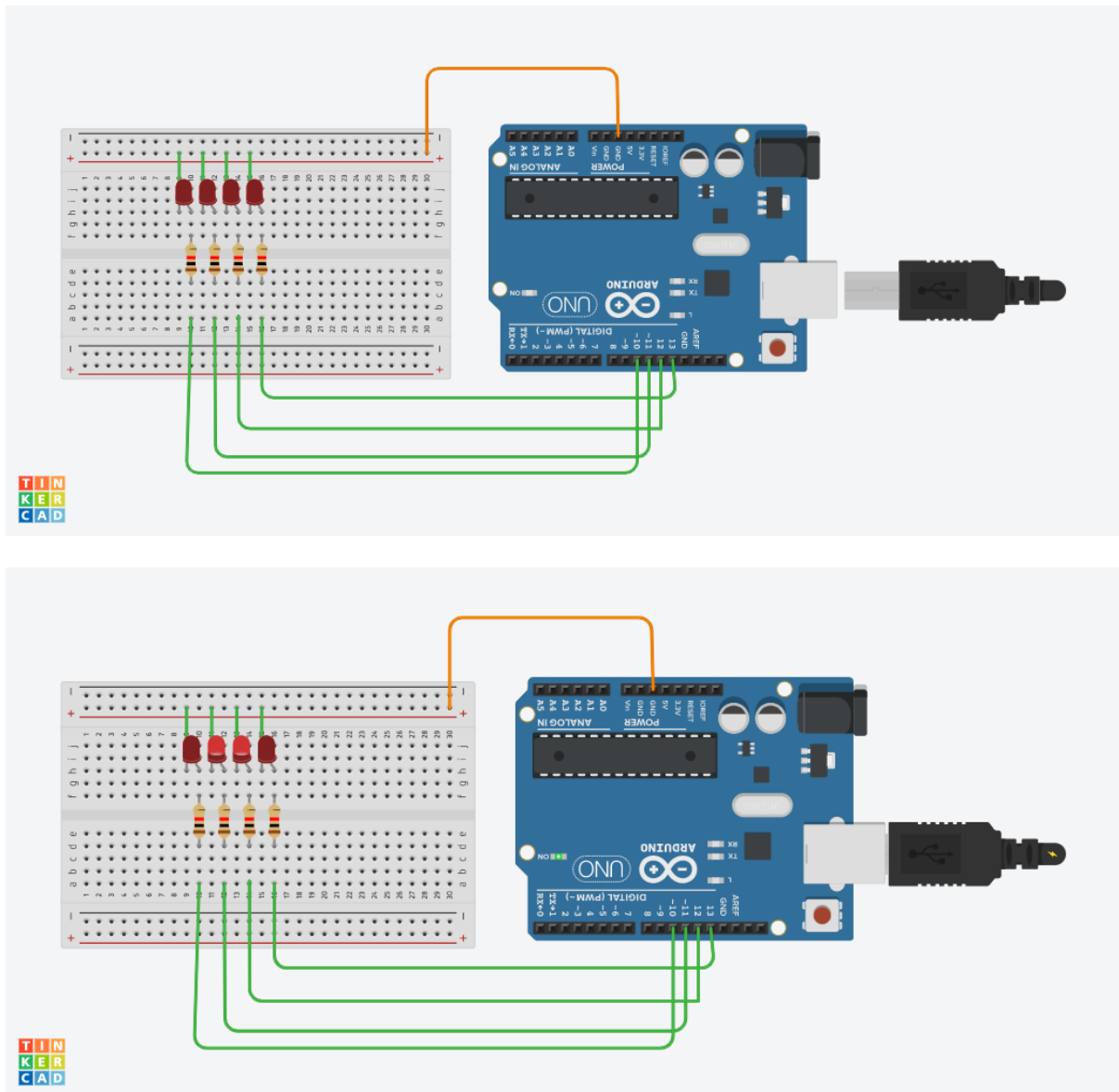


Fig: 2 LED'S flashing together

Theory:

Concepts used are:

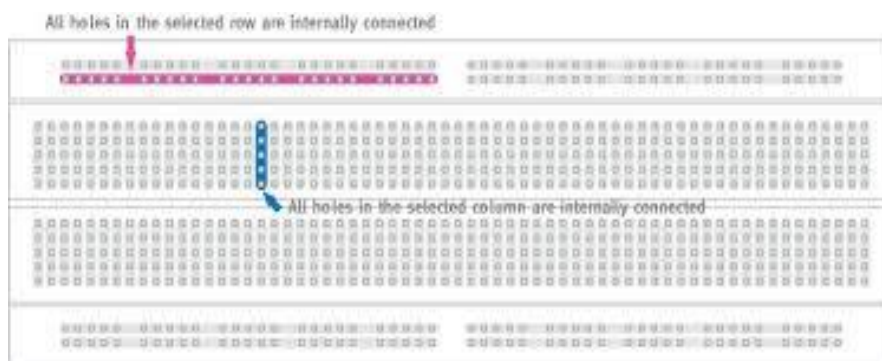
- *Working of LEDs (Light emitting diodes)*
- *Working of Arduino UNO*
- *Circuitry of Breadboard and it's use*
- *Code used to program the micro controller.*

Arduino Uno circuit board:

- 1. The arduino board can supply 5V as digital output signals from 14 pins (namely 0 to 13) present in it as digital input or output pins.*
- 2. The GND pin of the arduino board acts as ground.*
- 3. In our experiment we use digital pin 13 through which we connect positive terminal of LED and the negative terminal of LED is connected to the ground pin named as “gnd” on Arduino board.*
- 4. Arduino is programmed to give output from digital pin 13 and gnd provide return pathway for current.*

Breadboard:

In the circuit diagram of bread board present below, the two rows present at the top and bottom are connected with each other in series and the columns present in between are connected in a set of 5 are connected vertically.



The Code used to program the micro-controller:

In order to blink the led's we have to write a certain set of instruction in arduino IDE. In this experiment code results in lighting up the LED for 1 sec and then dimming down the LED for 1 sec. As long as the supply is connected to Arduino, the LED continues to glow.

Ohm's Law

Ohm's law states that the current through a conductor is directly proportional to the voltage across the two points provided that the physical conditions such as temperature

remains constant.

Combination of LEDs in Parallel circuits:

We know in parallel connection voltage remain same while current divided in branches. So each LED glow with the same brightness. There is no lack in the brightness of any LED.

How to use multiple digital pins of Arduino Uno at the same time:

All the p terminals of LEDs are connected to the Arduino Uno Board with the help of separate wires and n terminal of the LEDs are connected to the ground pin of the Arduino Uno board with the help of single wire.

Learning & Observations:

- *Coding in Arduino IDE is a very systematical way to show how the circuit is working.*
- *Arduino simplifies the process of working with microcontrollers*
- *Learnt the importance of calculated delay as the micro-controller is very fast and capable.*
- *Observed that there are many other interesting functions. Apart from void setup () and void loop () we can use our own function anywhere in the program.*

Problems & Troubleshooting

- *We have to take at least 4 tries to find the right amount of delay so that one LED glows for the correct time interval .*
- *At first the LED was not working properly so we had to change and put a new LED in its place.*
- *The circuit was not getting closed as the wires were not connected properly so I made sure that the connections were made properly.*
- *The required pattern was not getting created because of some error in the code so I had to change the code as per requirement.*
- *Proper closing of while using loops in the code.*

Precautions

- *Remember to declare all the ports used in digital input/output in correct way.*
- *Ensure that all wires are working correctly and all connections are tight.*
- *Remember to connect Negative end of device (in this case LED) to GND (ground) in Arduino Uno and positive end of each to a separate digital input output pin.*
- *Set right amount of delay so that circuit performs at its best.*

Learning Outcomes:

From this experiment we learn and acquire skills about:

- 1. How to make circuits using arduino board and bread board.*
- 2. Working of Arduino along with the LED.*
- 3. Application of digital pins of Arduino Uno Board.*

Program:

```
void setup()
```

```
{
```

```
for(int i=10;i<14;i++)
```

```
{  
  
  pinMode(i,OUTPUT);  
  
}  
  
}  
  
void loop()  
  
{  
  
  allledsoff();  
  
  for(int i=10;i<14;i++)  
  
  {  
  
    if(i==13)  
  
    {  
  
      digitalWrite(i,HIGH);  
  
      digitalWrite(i-3,HIGH);  
  
      delay(100);  
  
    }  
  
    else  
  
    {  
  
      digitalWrite(i,HIGH);  
  
      digitalWrite(i+1,HIGH);  
  
      delay(100);  
  
      allledsoff(); } } }  
  
void allledsoff()  
  
{
```

```
for(int i=10;i<14;i++)
```

```
digitalWrite(i,LOW);
```

```
delay(200);
```

```
}
```