**REPORT**

ON

**Traffic Intensity Calculator**

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SUBMITTED

TO

**VISHWAKARMA INSTITUTE OF INFORMATION TECHNOLOGY, PUNE**

**For the PBL of Digital Electronics**

IN

**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION**

**AY 2023-24**

**Semester II**

BY

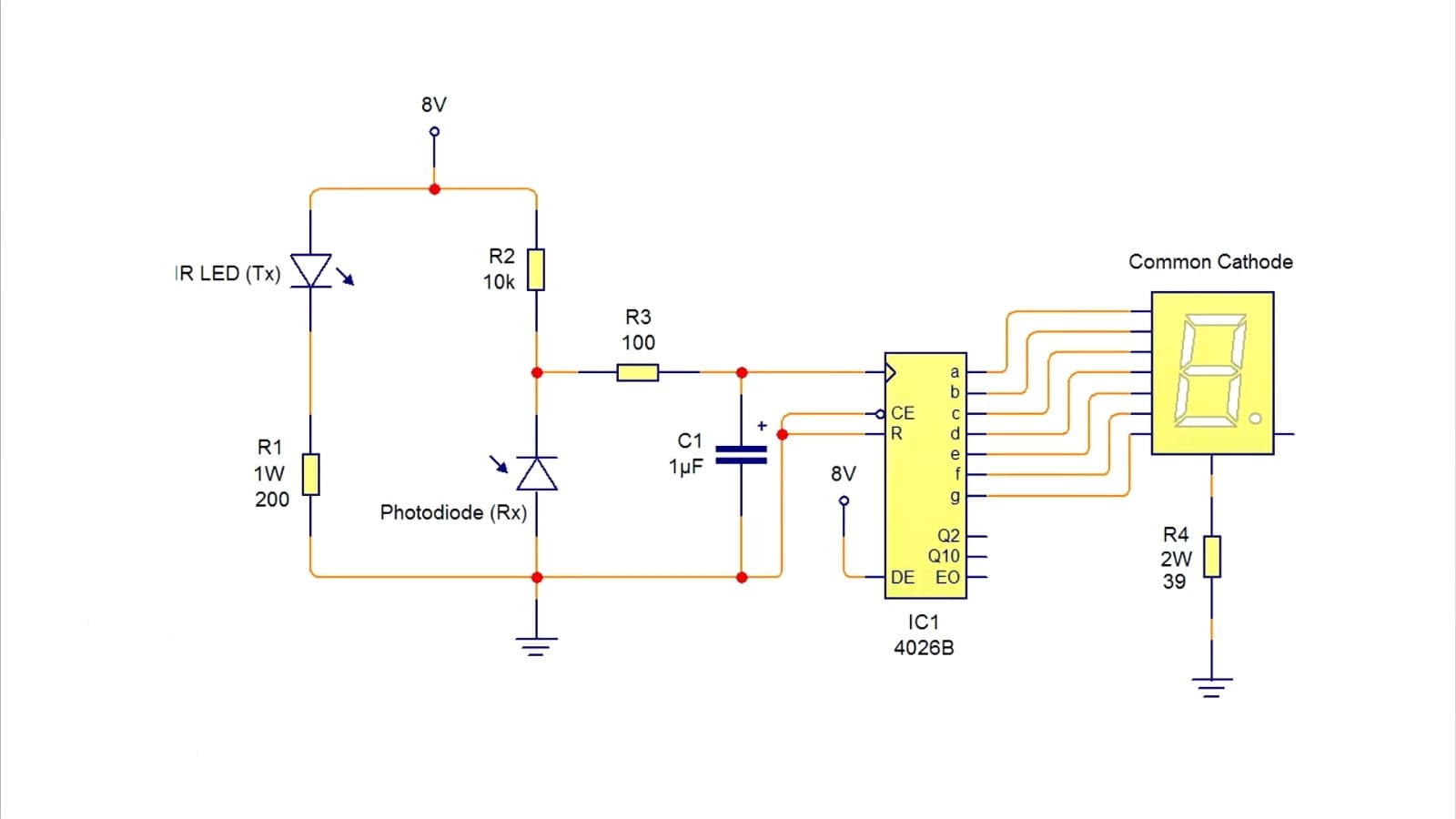
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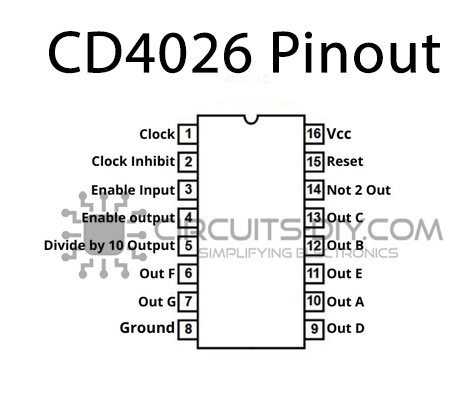
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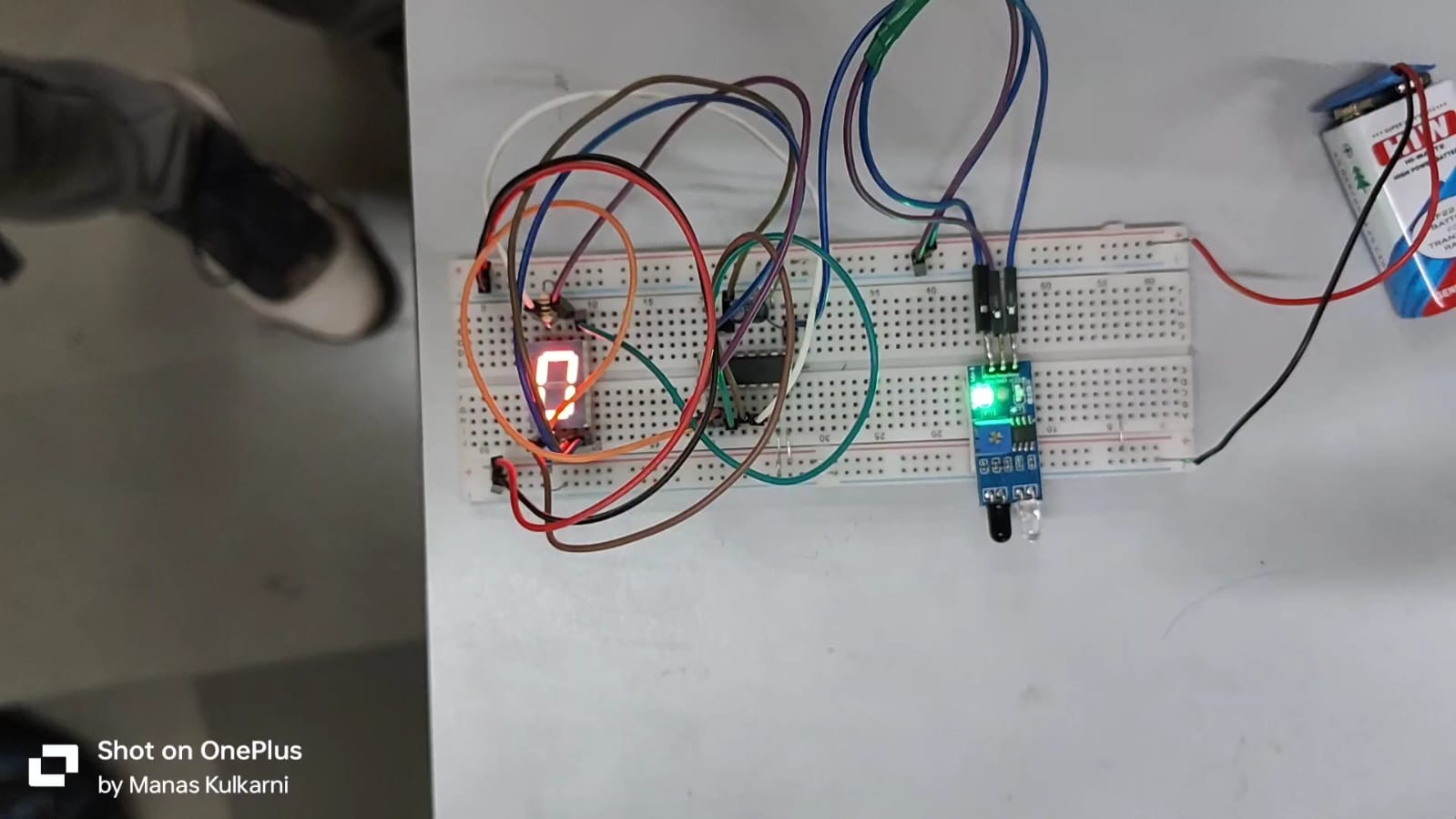
**Circuit Diagram**

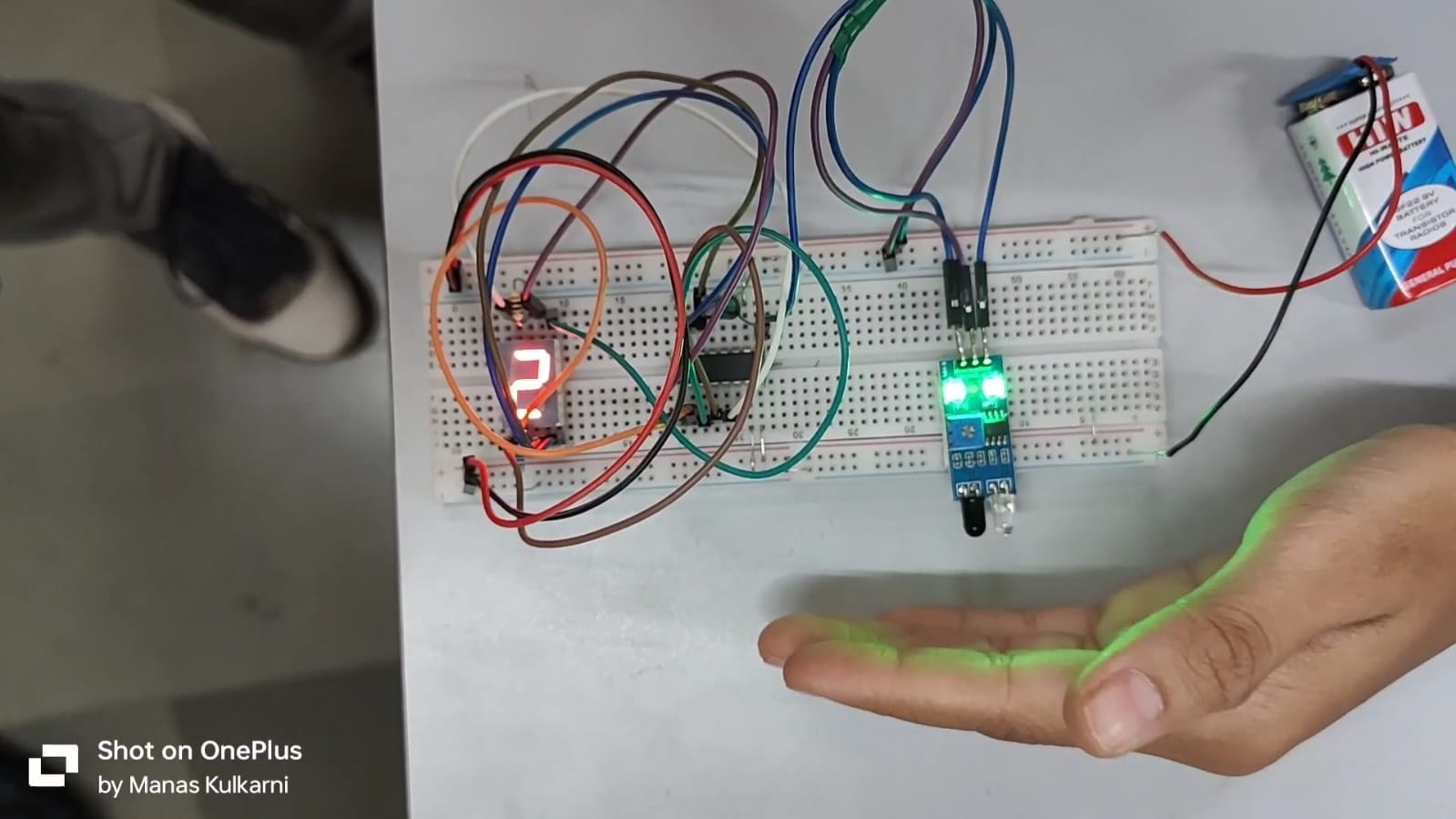


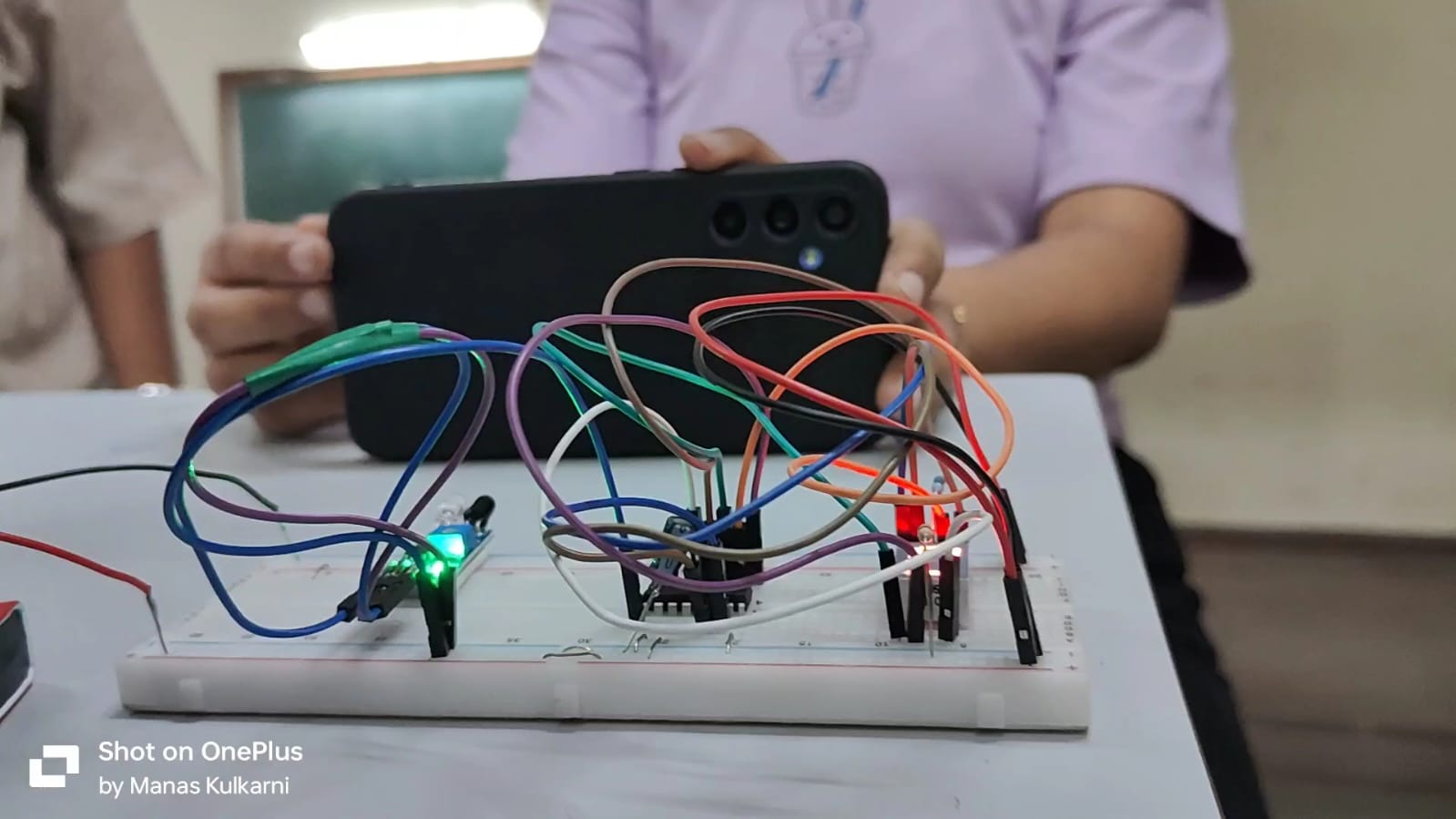
**CD4026 Pinout Diagram**



**Images of Model**







**Code (Python – Tkinter)**

import tkinter as tk

def calculate\_traffic\_intensity():

    num\_vehicles = int(entry\_vehicles.get())

    time\_seconds = int(entry\_time.get())

    intensity = num\_vehicles / time\_seconds

    result\_label.config(text="Traffic intensity: {:.2f}".format(intensity))

# Create main window

root = tk.Tk()

root.title("Traffic Intensity Calculator")

# Create input fields

label\_vehicles = tk.Label(root, text="Number of vehicles:")

label\_vehicles.grid(row=0, column=0, padx=10, pady=5)

entry\_vehicles = tk.Entry(root)

entry\_vehicles.grid(row=0, column=1, padx=10, pady=5)

label\_time = tk.Label(root, text="Time in seconds:")

label\_time.grid(row=1, column=0, padx=10, pady=5)

entry\_time = tk.Entry(root)

entry\_time.grid(row=1, column=1, padx=10, pady=5)

# Create calculate button

calculate\_button = tk.Button(root, text="Calculate", command=calculate\_traffic\_intensity)

calculate\_button.grid(row=2, column=0, columnspan=2, pady=10)

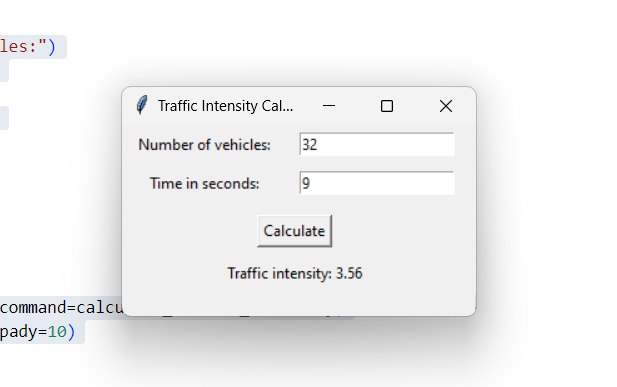
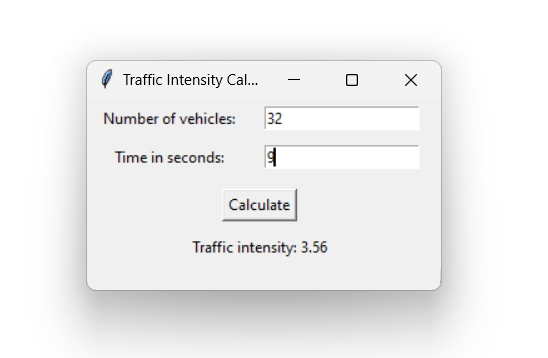
# Create result label

result\_label = tk.Label(root, text="")

result\_label.grid(row=3, column=0, columnspan=2)

root.mainloop()

**Output**



**Working of Project**

**CD4026 IC:**

* The CD4026 is a **CMOS counter IC** with a built-in **7-segment output driver**.
* It is capable of driving **common cathode LED displays** directly.
* The IC has a **5-stage Johnson decade counter** and an output decoder.
* The output decoder transforms the Johnson code into a **7-segment decoded output**.
* The IC increments its count each time it receives a **high clock pulse**.
* In our project, this pulse is generated when a vehicle interrupts the infrared beam of the IR module.
* The **clock inhibit pin (pin 2)** is held low (ground/0V) so that the clock signals can be sent to the IC.
* The **Enable Input pin (pin 3)** is made high (+5V) to activate the output pins.
* The IC can work from **3V to 15V**, but we typically power it with +9V to the Vdd/Vcc pin.
* The **Ground/Vss pin** is connected to the ground.
* The **7-segment pins** will increment the count by one number each time when the clock pin (pin 1) is made high.

**Python Tkinter:**

* We have used Python Tkinter to create a **simple interface** that displays the current count of vehicles from the CD4026.
* By dividing the total count of vehicles by the elapsed time (in seconds), we calculate the **vehicle intensity** (vehicles per second).
* This value is then displayed on the Tkinter interface.

**Project Integration:**

* We have developed a system that not only counts vehicles but also calculates and displays vehicle intensity.
* This is achieved by integrating the hardware components (CD4026 IC and IR module) with the Python Tkinter interface.
* This combination of hardware and software components makes our project a robust and efficient solution for vehicle counting and intensity calculation.