CLEAN AND GREEN TECHNOLOGY

Tejaswi s
Ananya Prabhu
Mentor: Dr Kaythry P

THE GREEN TECHNO CAMPUS

Tejaswi s
Ananya Prabhu
Mentor: Dr Kaythry P

PROBLEM STATEMENT

- Global warming and climate changes have been drastically increasing and posing a serious threat to the balance of our environment and biodiversity.
- Sustainable development using the latest eco friendly green technology is the need of the hour to make an impact and turn the tides around

WHAT'S OUR SOLUTION?

- Implement a **Green Techno Campus** at institutions be it work , school or college which incorporates the **usage of green technology at various segments**

- We present to you **our Green Techno Portal, a website application that is integrated to an IoT based gate entry system that permits entry into the premises and provides parking facility based on the mode of transportation opted by the person.**

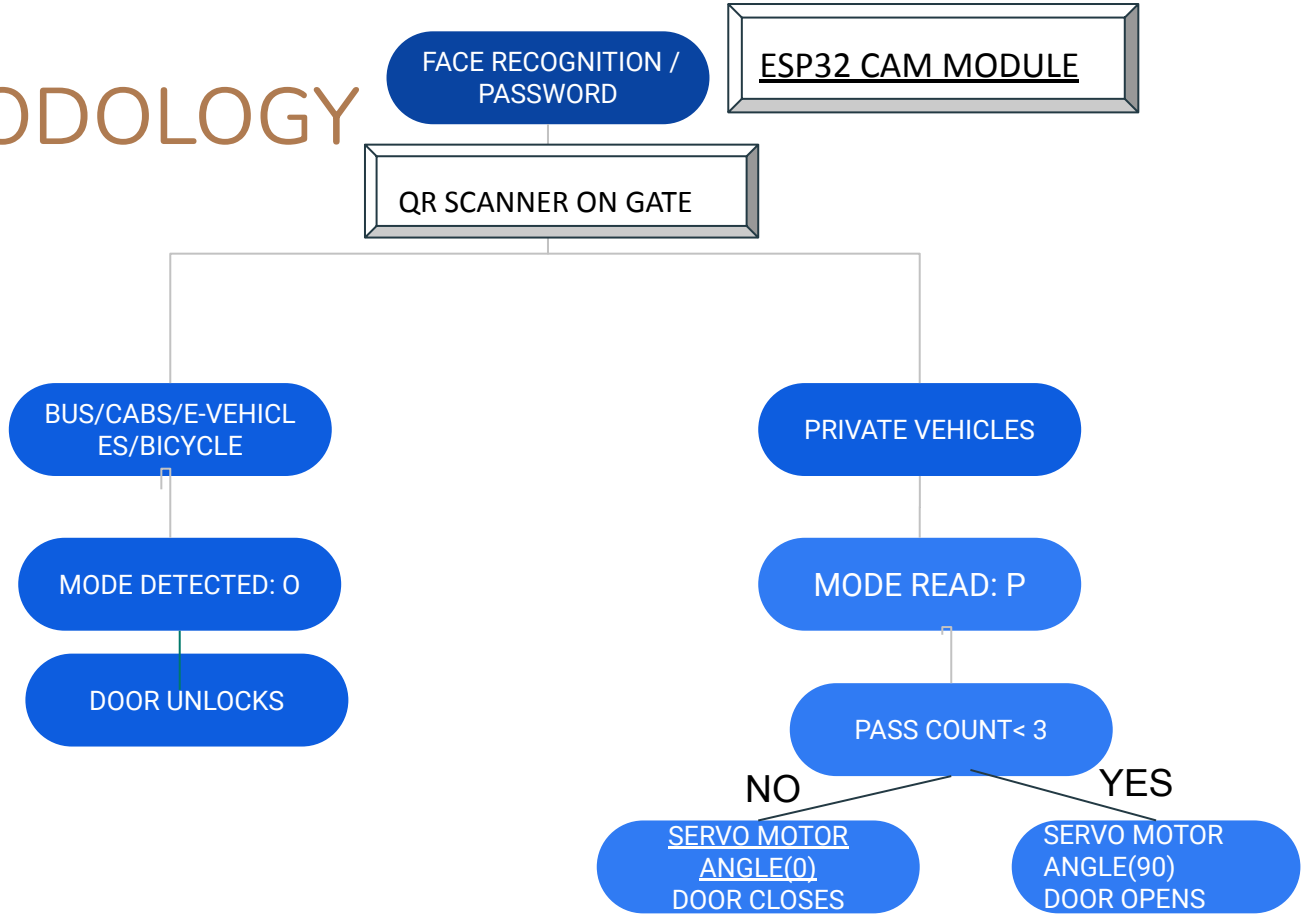
- Another segment of implantation is **the usage of sensors to automate the switching ON and OFF of electrical appliances and maintain a database on web portal to collect real time data to analyse and detect maximum areas of energy consumption**

TRANSPORTATION

METHODOLOGY

- ***Face recognition & keypad access code***(recognises caretakers/parents)- **ESP32 cam module** for face recognition
- **keypad** to type in the code
- **Maikrt Embedded QR Code Scanning Module** USB and **UART Serial Port Barcode Scanner Identification Module Bar Code Reader** attached to arduino uno fixed at the gate for **access control**
- ***Servo motor***-for locking and unlocking of the gate
- ***Arduino uno/nano(depending on size requirements) wifi rev*** 2- regular arduino microcontroller board with inbuilt wifi and bluetooth.
- **The ESP32 cam** is mounted on to the arduino board and can be controlled using arduino IDE.
- **Automatic Toll gate Using Arduino and HC-SR04 sensor- IR sensor** from one end detects the frond end of the vehicle. Another IR sensor detects back end of vehicle to calculate time to be kept open.

METHODOLOGY

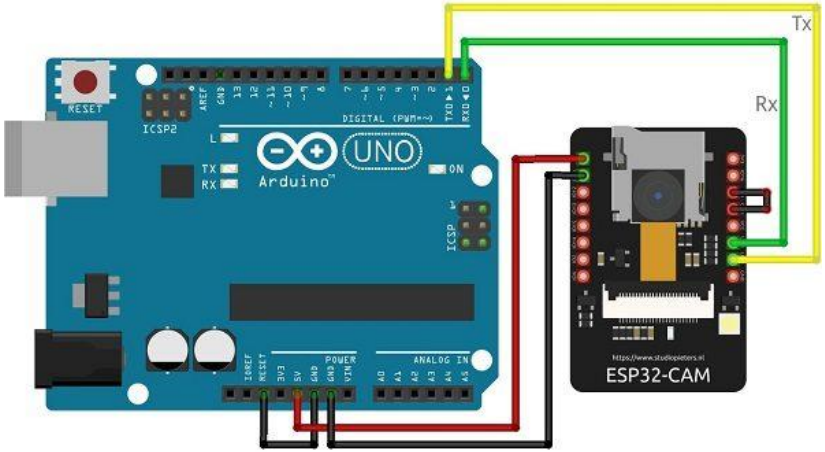


WORKING PROCESS

WORKING PROCESS

- Every person provided with an ID CARD has either P or O printed on them to indicate their opted mode of transportation. College buses,car pooled cabs, ece friendly E vehicles are all given “O”- refers to “Others”
- They obtain immediate access to enter the premises and access to free parking.
- On the other hand, for people who commute using private vehicles, they have “P” assigned in their ids- “PRIVATE”
- It is mandatory to opt for one of the buses or car pooled cabs provided by the institution. People living nearby who walk or cycle are permitted access immediately
- Any person with “P” id card gets to use their autonomous vehicle to commute only 3 times a week which is 50% of the working days. A data base check system keeps count of the number of times P passes are used by an individual. If the count exceeds 3, a fee has to be paid as parking charges based on the hours parked inside the campus

ESP32 CAM

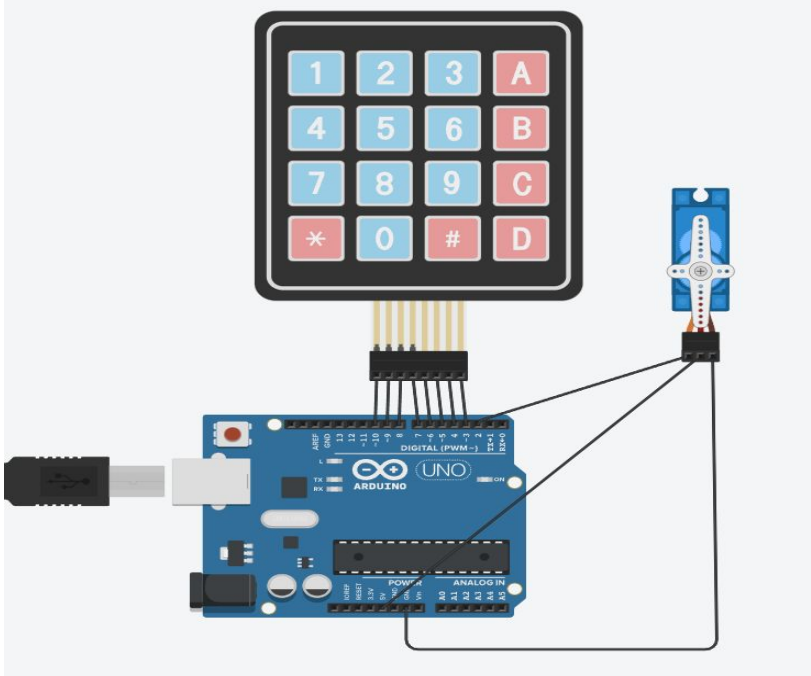


★ Faces of all students and faculties are enrolled in esp32cam server during initial installation stage

★ If enrolled face gets recognized basis the database, the door gets unlocked

BACK

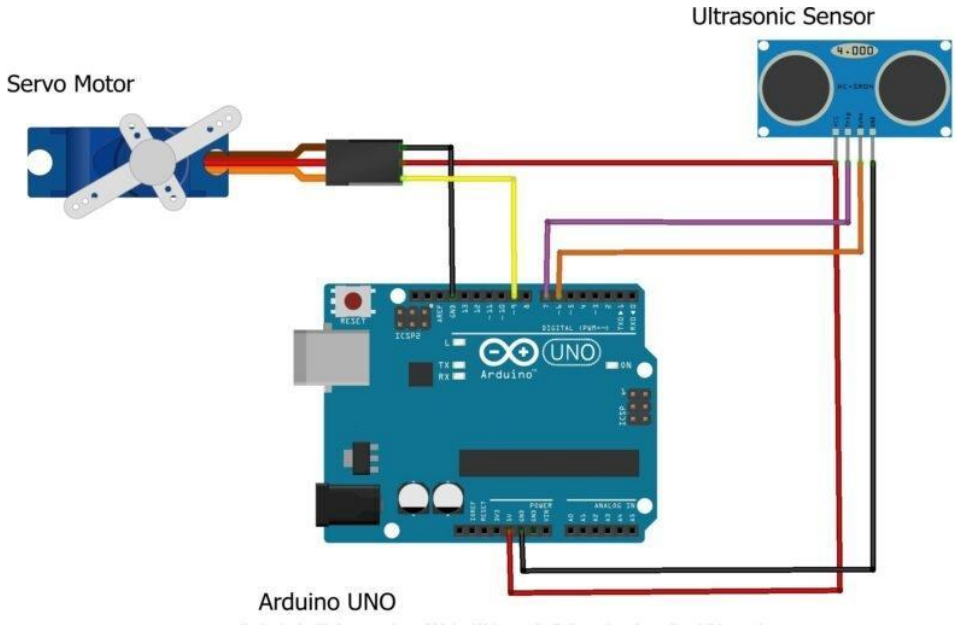
KEYPAD AND SERVO MOTOR



MAIKRT QR SCANNER

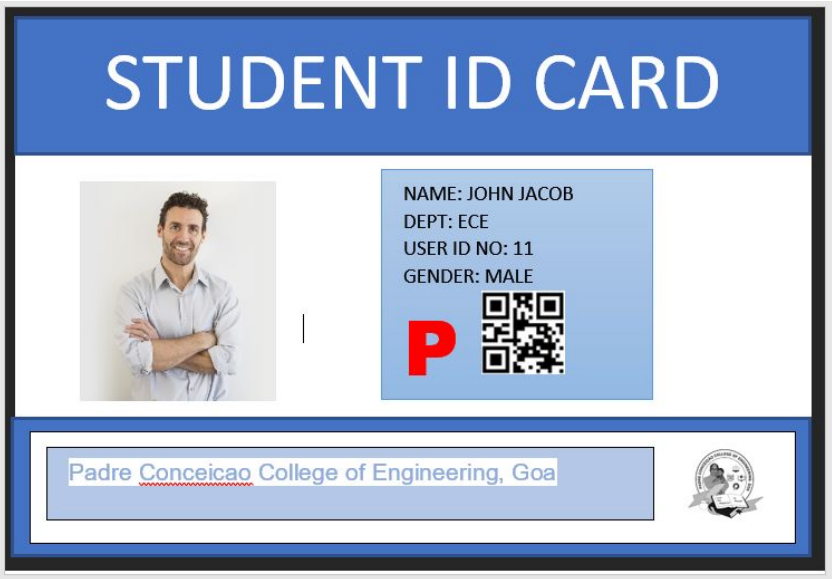
MAIKRT embedded QR scanning module

Automatic Toll gate Using Arduino and HC-SR04 sensor

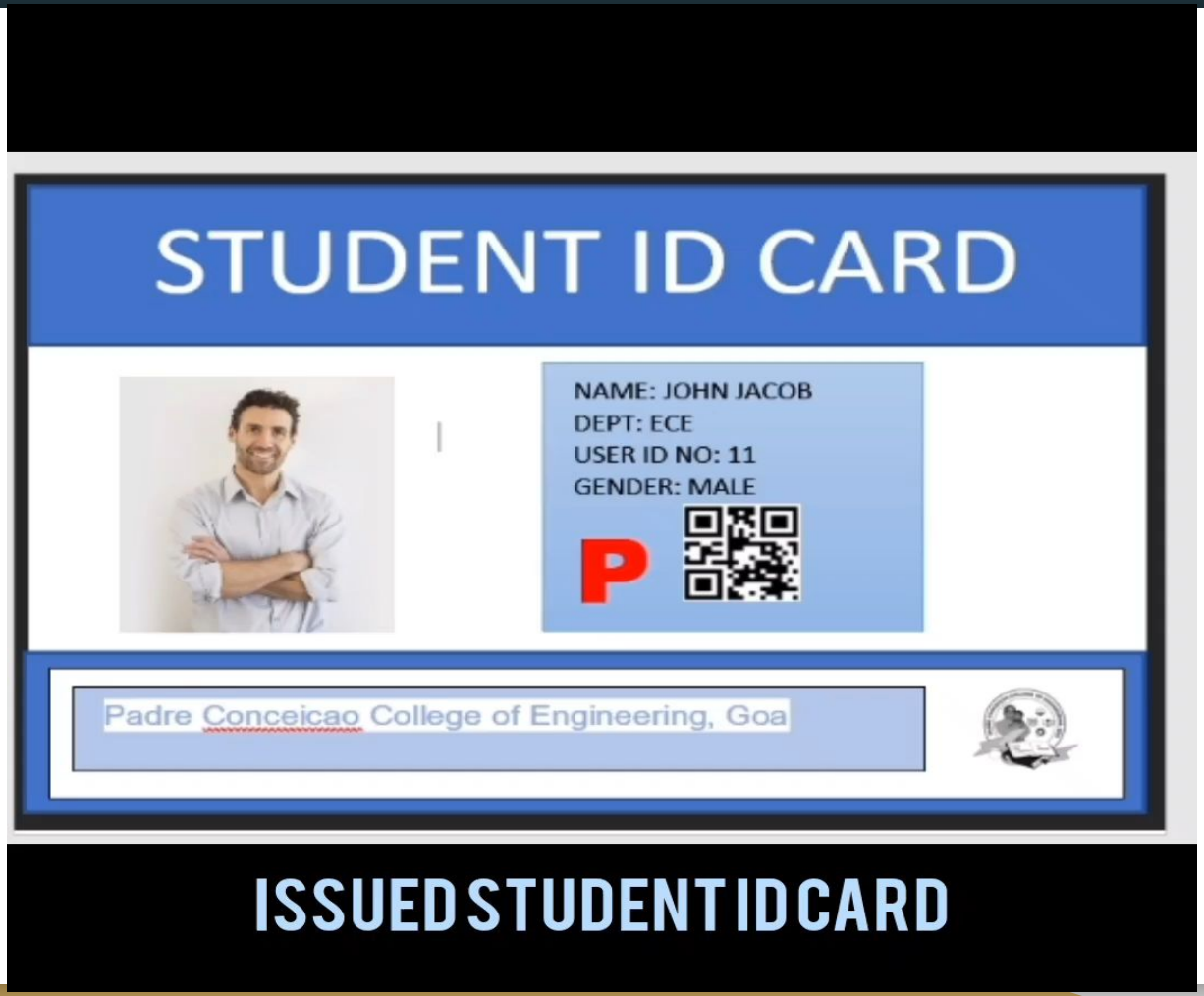


BACK

STUDENT ID CARD



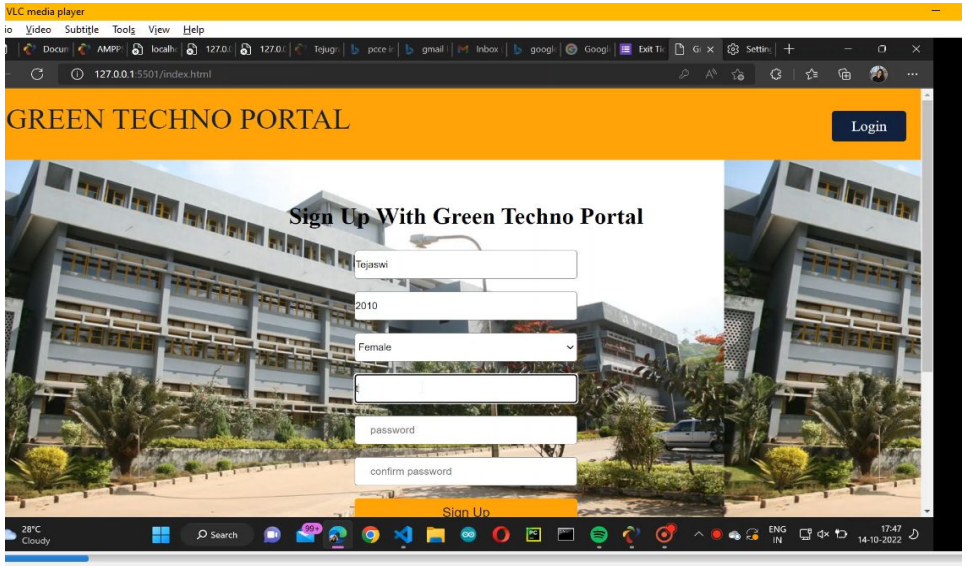
Student ID card with inbuilt QR code



ISSUED STUDENT ID CARD

WEB APP FEATURES

- A **student login portal** is provided to students which has **various underlying domains**
- **Student Incentives –** A domain which provides **incentives to students on credit based system basis** the information provided by student about their **active participation in events promoting Green Techno Campus with related documents**
- **Entry Allowance Details-** Provides information on **number of passes left at the main gate entry**
- **Carbon Emission details- provides carbon emission data on a real time basis**



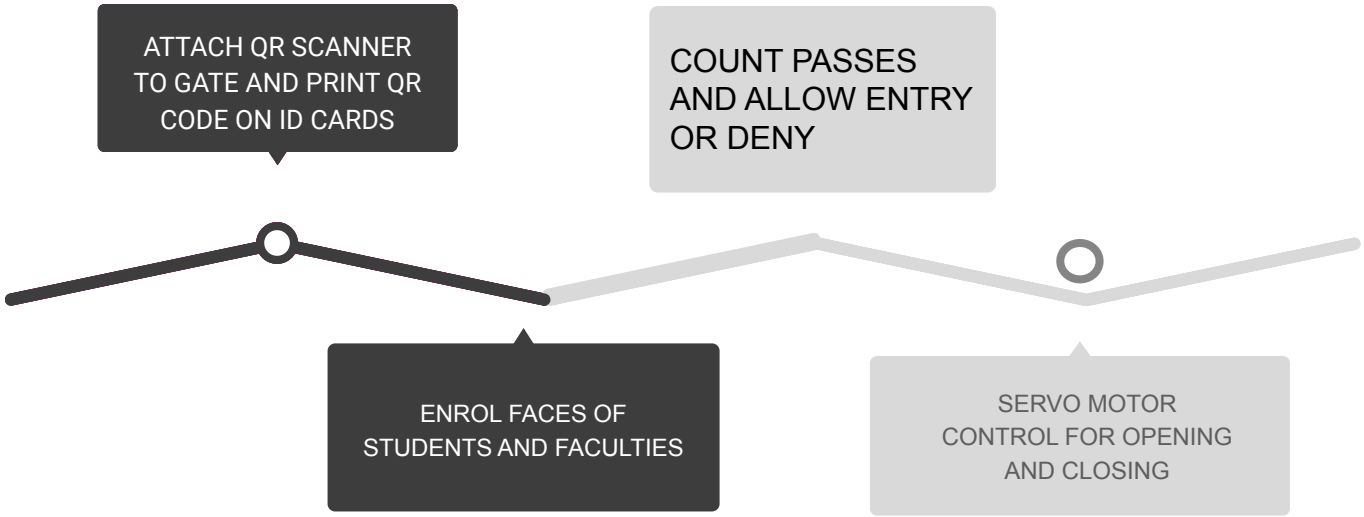
CLOUD DATA MANAGEMENT

- **Proper cloud data management is of utmost importance.**

- Cloud data management is very different from traditional data management methods and **has several advantages** such as

✔ security,
✔ zero maintenance,
✔ automated backup and so on.

INSTALLATION PROCESS



CARBON EMISSION DATA

CO2 emissions for private cars

CO2 equivalent emitted from Private cars

Sample Calculation-1

Category	No of Private Cars considered	Distance travelled per day (km)	No of operating days in a year	Total distance covered in a year (km)	GHG emission factor for buses (kg CO2 / km)	CO2 emitted
Short	2	5	180	1800	0.73	1.31
Medium	7	70	180	88200		64.39
Long	5	135	180	121500		88.70
					Total	154.44

Note: We assume that the condition of all cars to be same.

NOVELTY

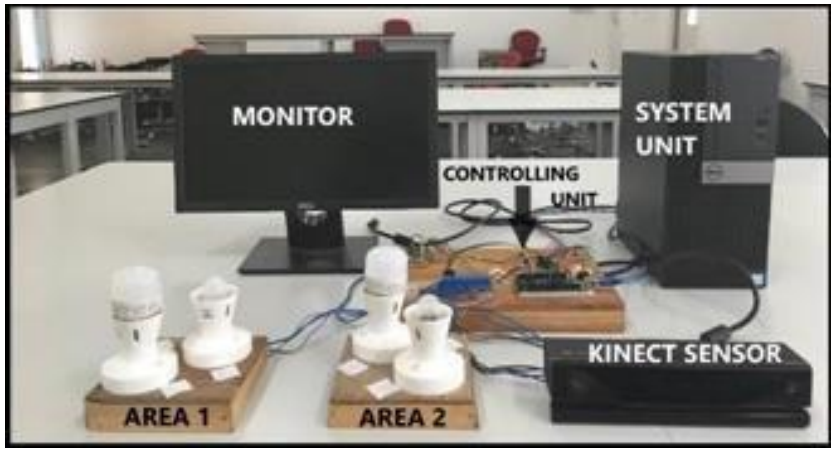
- **Integrating recent MIAKRT EMBEDDED QR SCANNER with a smart door lock** system
- **Data base system** to track number of **exhausted passes to reduce use of autonomous vehicles a**nd keep check on carbon footprints emitted by each mode of vehicle
- **Web portal to encourage active participation of students** in this scheme by providing credits
- **Timely updates of data** regarding available passes to prevent penalty
- Since values are stored in cloud there are **no chances of losing the data history**
- **Backup keypad access code to help in times of technical failures of the face recognition system**

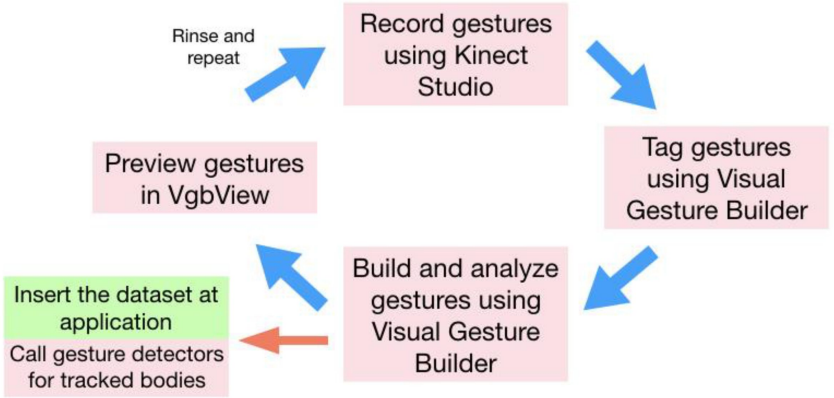
ENERGY MANAGED BUILDINGS

WORKING PROCESS

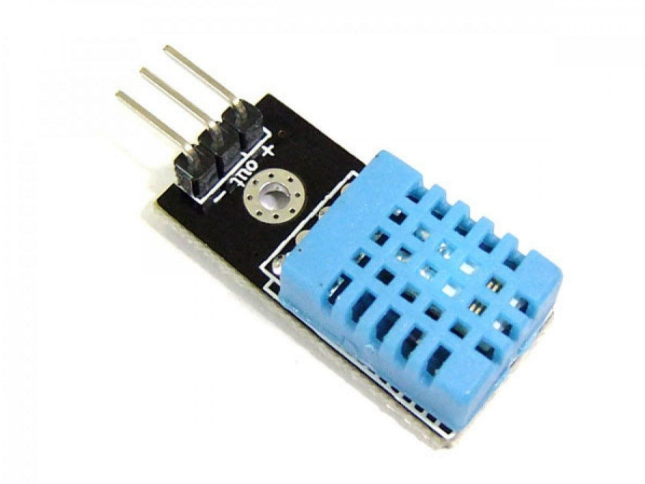
- Usage of photo resistive sensors to control switching ON and OFF of tube lights bulbs and luminous appliances
- Usage of temperature sensors to control temperature of air coolers to minimize energy consumption
- Usage of KINECT Sensors to control switching ON and OFF of fans

KINECT SENSORS





TEPERATURE SENSORS



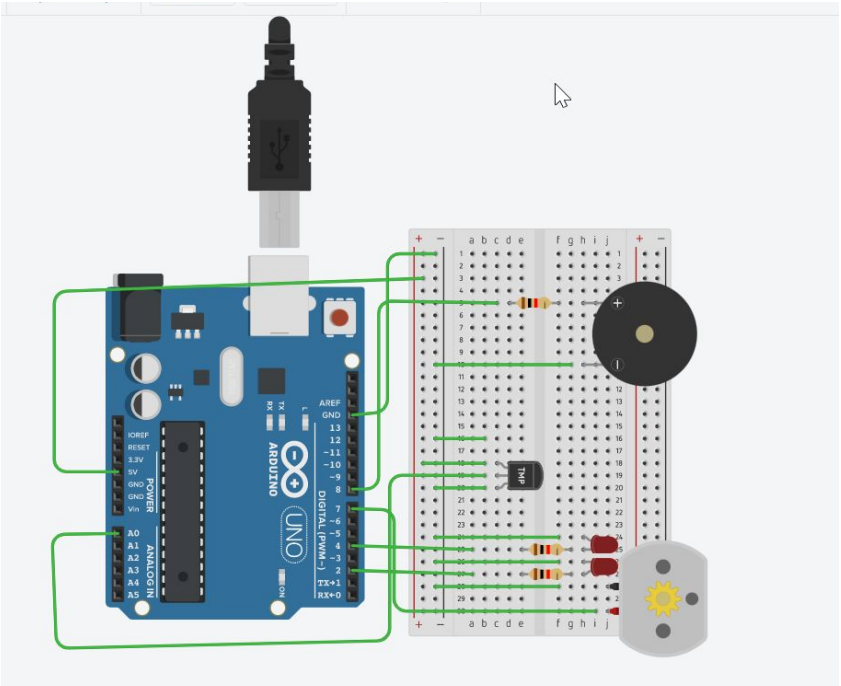
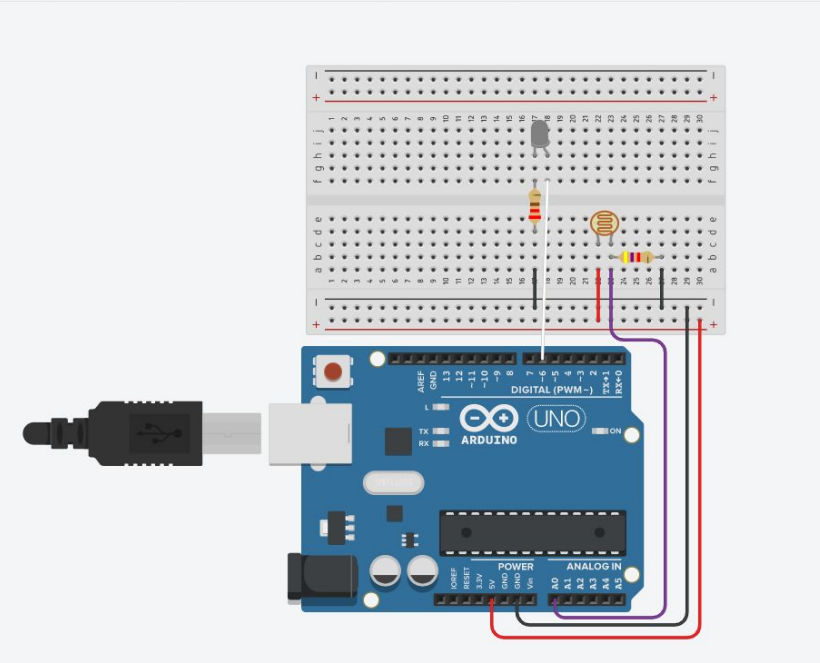


PHOTO RESISTIVE SENSORS



Inbox (1,358) - tejaswi2010361@ | Tejugram | login | Circuit design fan control usign t

https://www.tinkercad.com/things/f5n3UXlbcTX-fan-control-usign-temp-sensor/editel

fan control usign temp sensor

Saved

Code | Start Simulation | Send To

Components
Basic

Search

Resistor | LED | Pushbutton

Potentiometer | Capacitor | Slideswitch

9V Battery | Coin Cell 3V Battery | 1.5V Battery

00:00:00

Video Source

Full Screen

Video Encoder

FFmpeg | Gif | SharpAvi | Stream | Discard

Mp4 (x264 | AAC)

FPS: 10 | Limit

Quality: 70%

Audio | Webcam

26°C
Mostly cloudy

Search

ENG
IN

09:00
15-10-2022

Inbox (1,358) - tejaswi2010361@ | Tejugram | login | Circuit design light sensor | Tinke

https://www.tinkercad.com/things/cOeGwSZCcQC-light-sensor/editel

light sensor

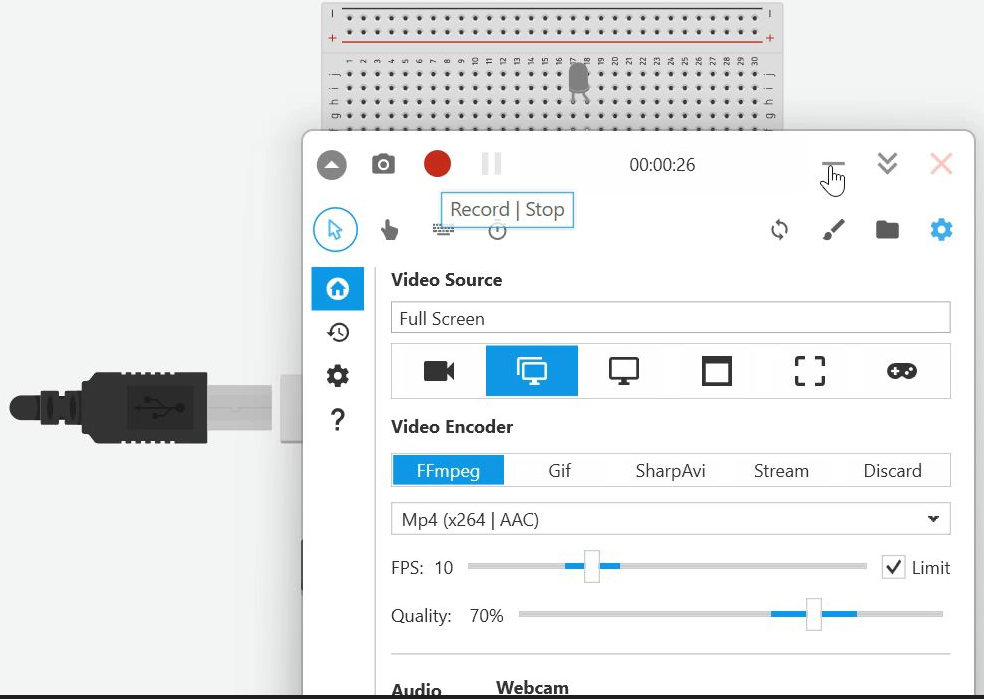
Saved

Code | Start Simulation | Send To

Components
Basic

Search

Resistor | LED | Pushbutton
Potentiometer | Capacitor | Slideswitch
9V Battery | Coin Cell 3V Battery | 1.5V Battery



26°C
Mostly cloudy

Search

ENG
IN

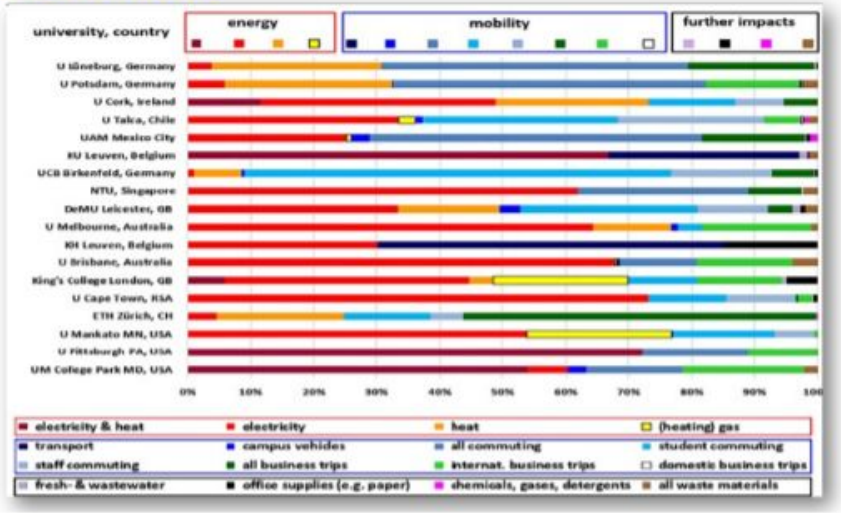
09:01
15-10-2022

DATA COLLECTION

- The Green Techno Web Portal also has a subdomain – CARBON EMISSION where details of the energy consumed by each fan light and air coolers in each classroom of each department is updated
- The data is also uploaded to CLOUD which helps in easy access of data for future reference
- A complete data analysis and study can be done to prepare reports on the carbon emission to detect areas of maximum energy consumption and innovate ideas to reduce the same

STASTICS

Distribution pattern of partial carbon emission impacts at 18 universities worldwide



CARBON EMISSION CALCULATION

A typical 48 inch ceiling fan will use 75 watts

Hours Used Per Day:

8

Power Use (Watts):

75

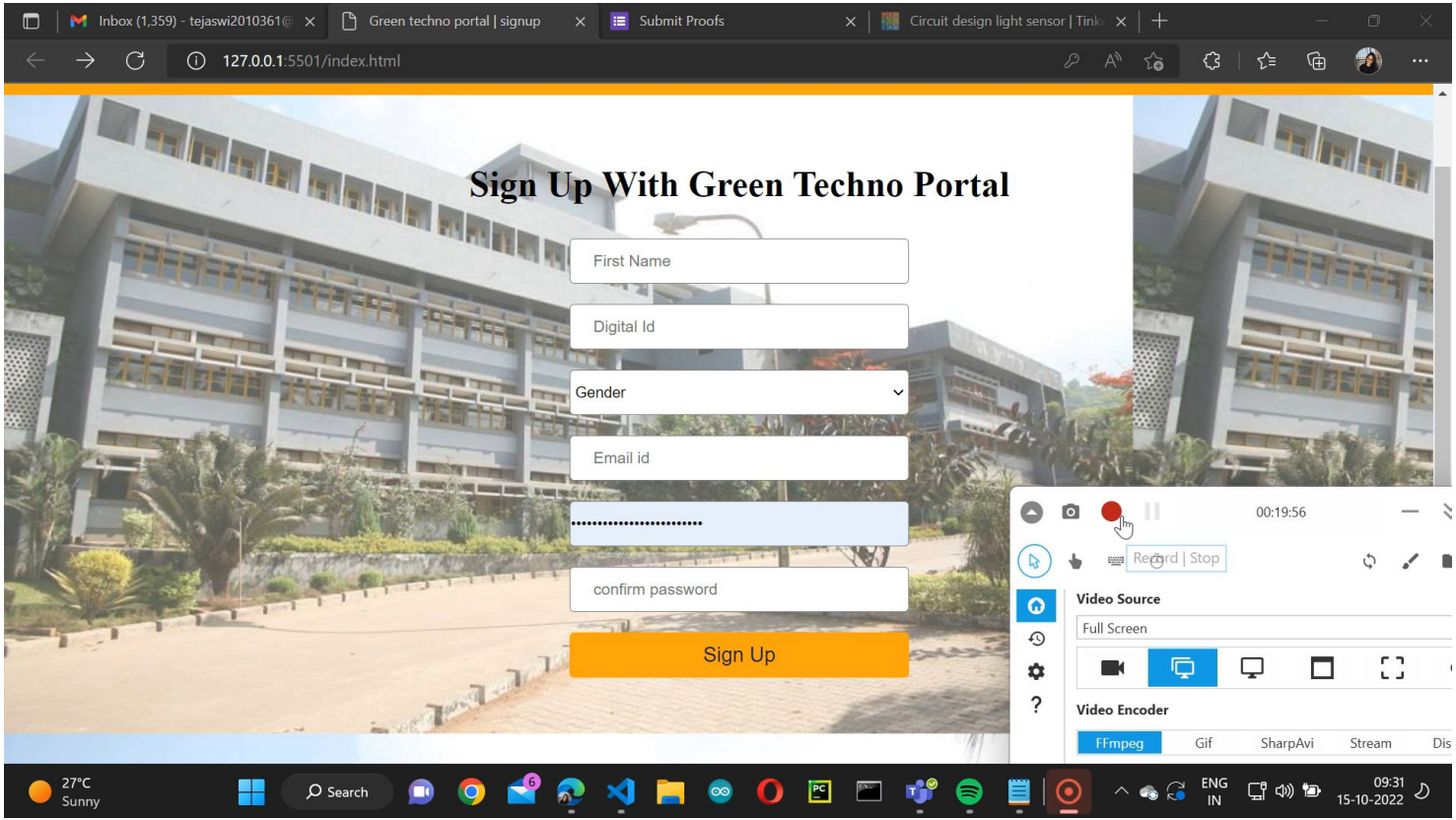
Kilowatts per day consumed - - 0.60KWh

1 unit of electricity = 1 Kwh

In a model class room

Sl.no	Name of the electrical appliances used in classroom	No.of appliances	Energy consumed Per item for 8 hours per day	Total energy consumed	CO_2 equivalent for one unit	Total CO_2 emission
1	Fan of 48 inch size	6	0.60KWh	3.6KWh	43 kg /KWh	154.8 kg
2	Tube lights	6	0.44KWh	2.64KWh	43kg/KWh	113.52kg

WEB PORTAL DATA BASE- VIDEO



CONCLUSION

- In conclusion we aim to reduce carbon emission by integrating recent technologies like **MIAKRT EMBEDDED QR SCANNER with a smart door lock** system
- And build a fool proof system to reduce use of autonomous vehicles to work
- Provide incentives to students and promote echo friendly activities among the future generation.
- Promote energy ,managed buildings
- Achieve sustainability in long run.

LINKS

- https://www.tinkercad.com/things/f5n3UXlbcTX-fan-control-usign-temp-sensor
- https://www.tinkercad.com/things/cOeGwSZCcQC-light-sensor

THANK YOU!