

The background of the slide is a dark blue field with a complex, glowing cyan circuit board pattern. The pattern consists of numerous thin, interconnected lines and small circles, resembling a microchip or a network diagram. The lines are more prominent on the left side, where they form a dense, wavy structure, and become sparser towards the right. The circles are scattered throughout, often appearing in small clusters or along the lines.

Making H105 a smart classroom

DASS Project no.: 36, Team no.: 21



Client: Vishal Garg

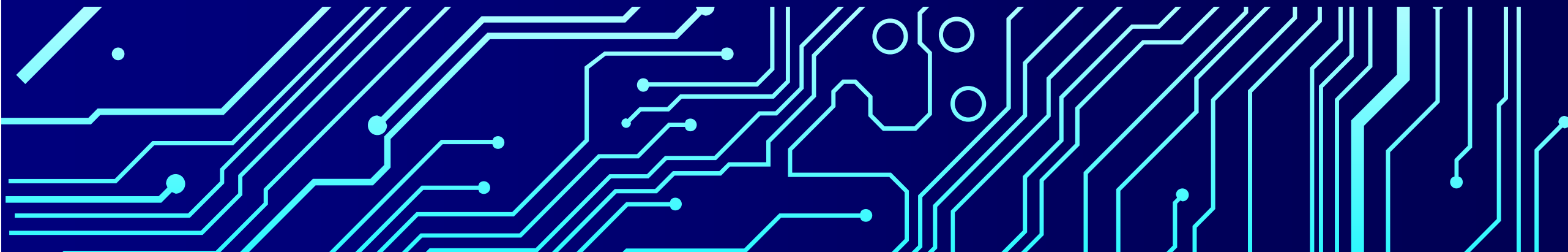
Mentors:

- Simran Singhal (Appointed by client)
- Lakshmi Sireesha Vakada (TA)

Team Members:

- Vishal Verma
- Akash Verma
- Archit Goyal
- Priyanshu Madaan

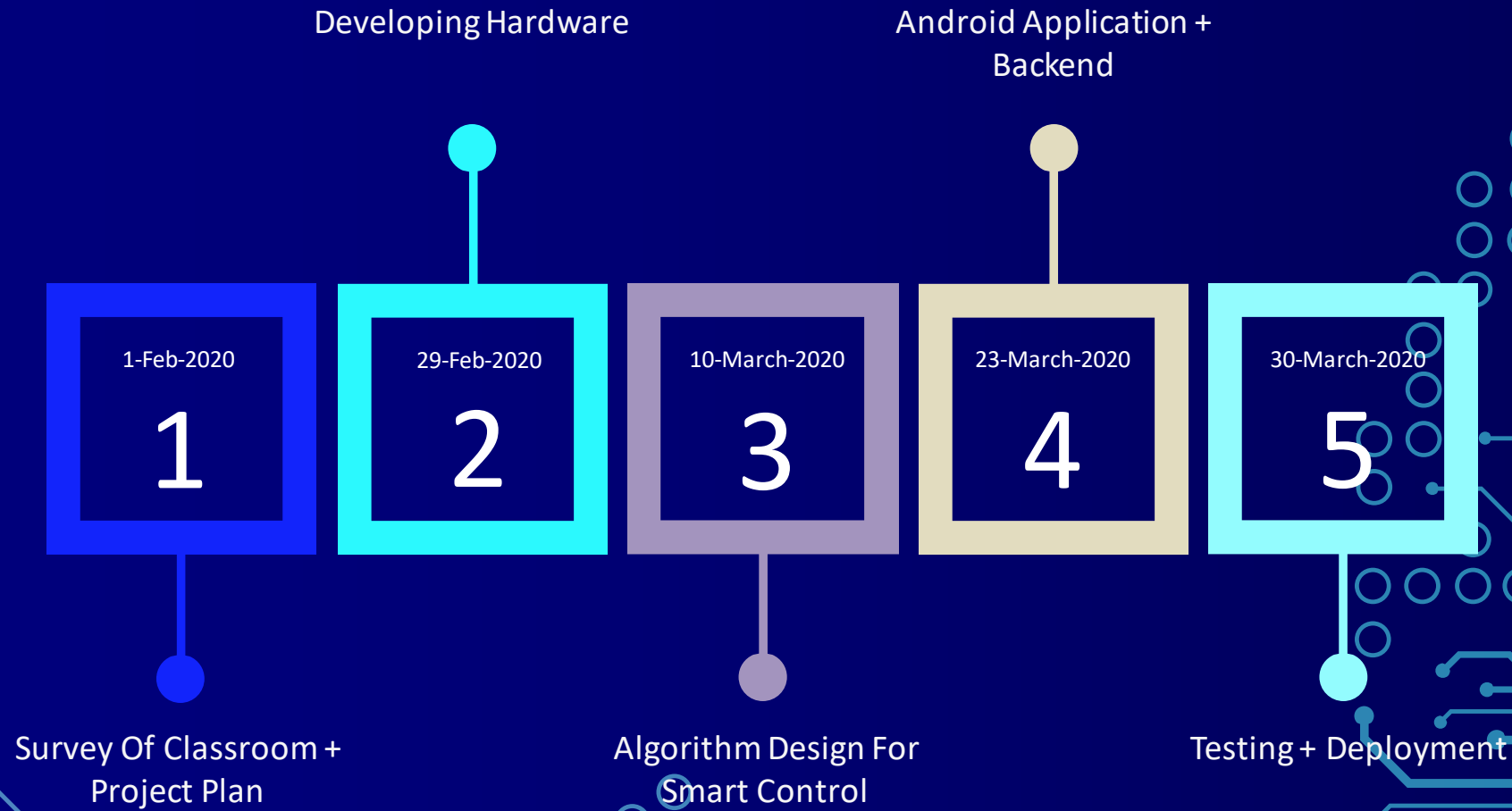
About The Project



Tasks in making H105 a smart classroom

- Automating Lights on the basis of occupancy.
- Deploying sensors to measure environment parameters of classroom.
- Automating AC's and evaporators on basis of sensors' data.
- Automating Projector to follow instructors voice command.

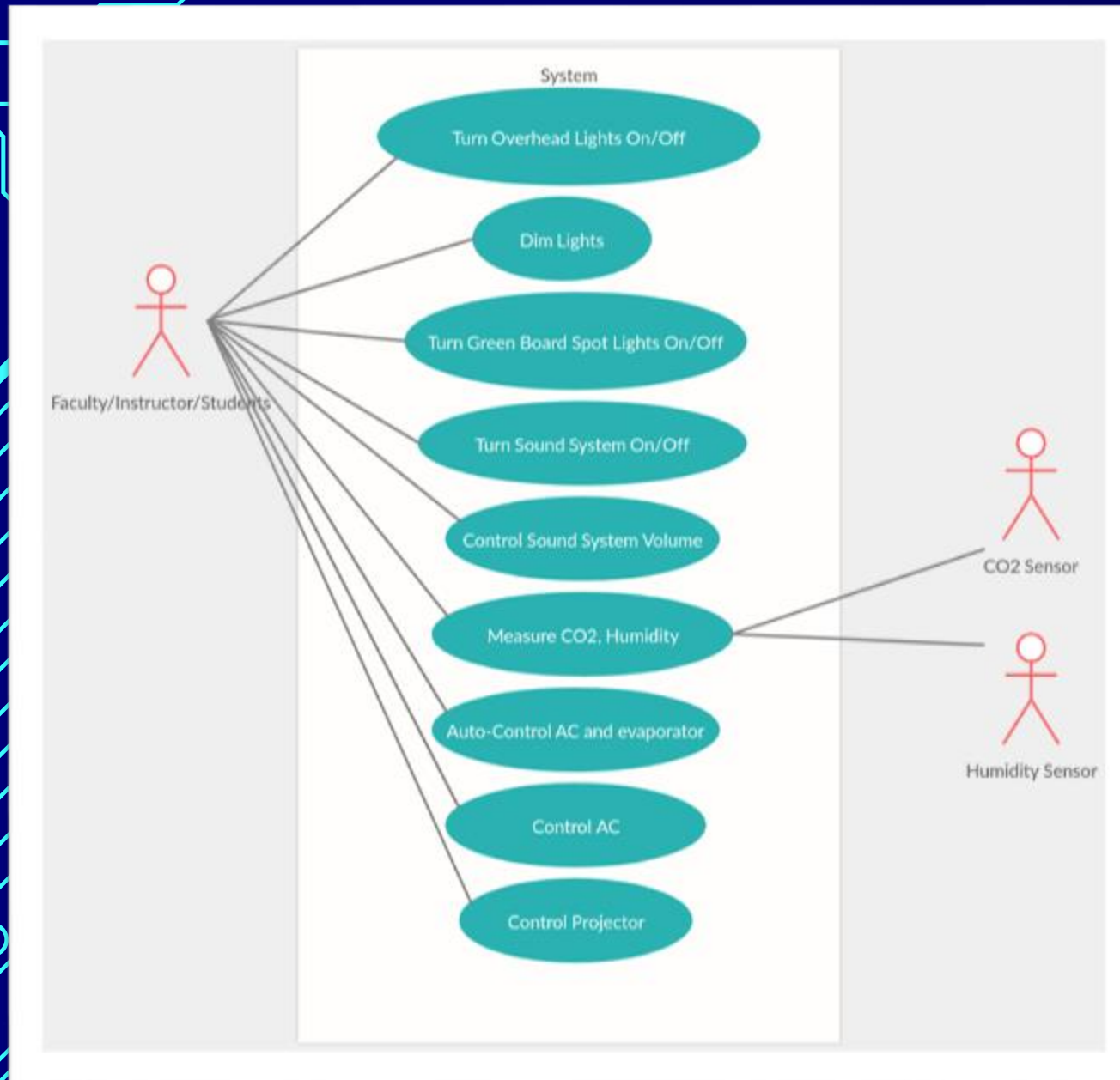
Timeline



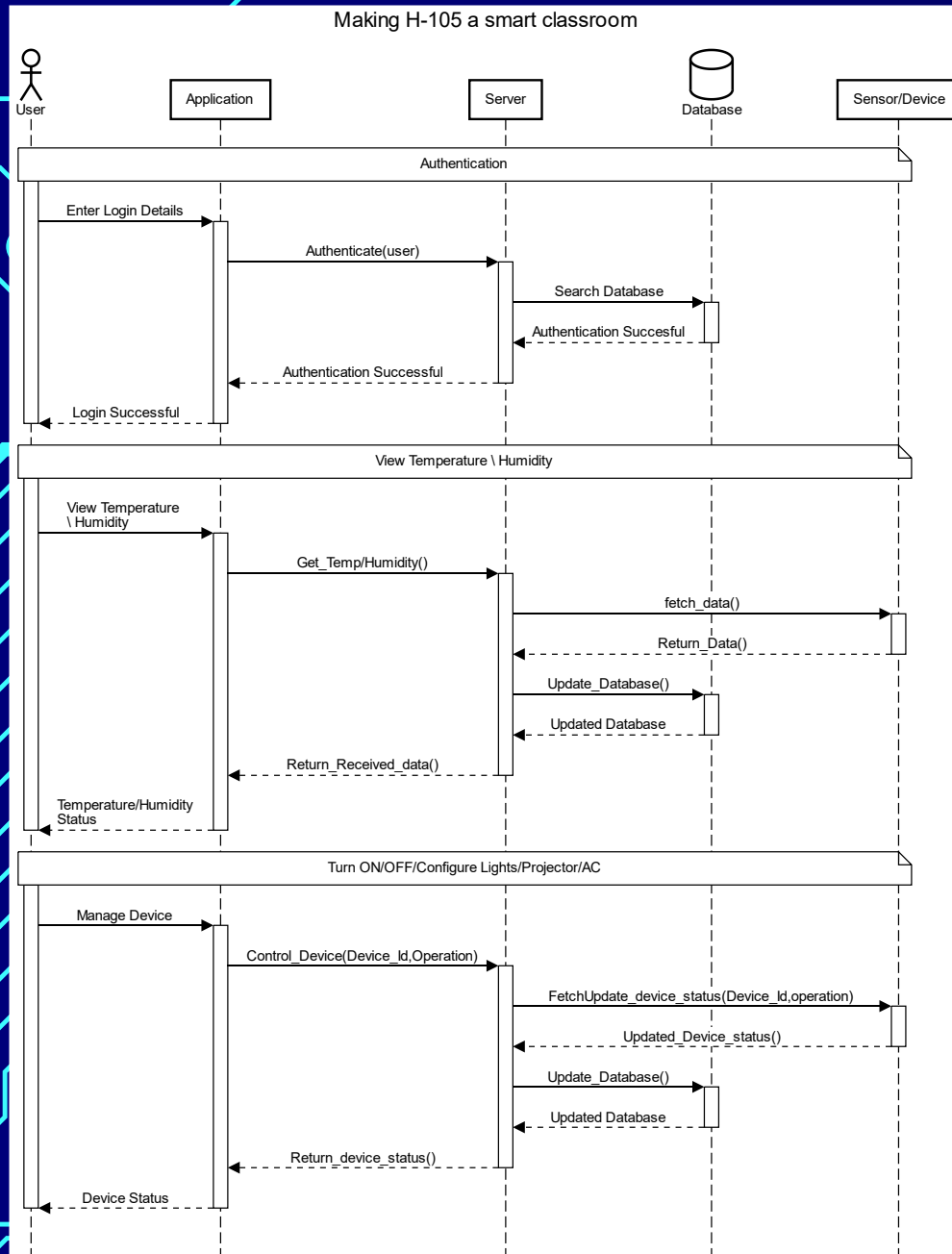
Progress Log

	Tasks	Status
Sprint 1	Study About Smart Classrooms and automation techniques and ESP32 and Hardware	Completed
Sprint 2	Survey Electrical, physical, AC and evaporator Layout of the H-105	Completed
Sprint 3	Developing hardware (Sensor circuits, lighting circuits)	Under Process
Sprint 4	Training and Testing B1 Hub and developing API's for B1 Hub	Completed
R1	Sending data from sensors to server and generating API's to fetch that data for future use .	Under Process

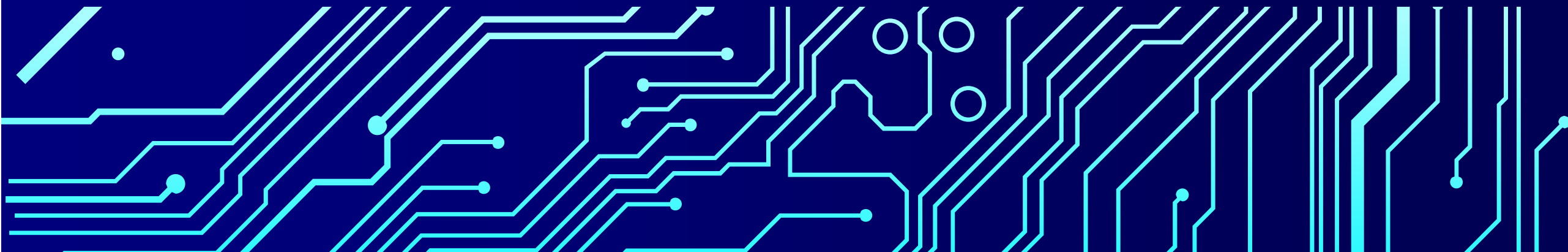
UML UseCase Diagram



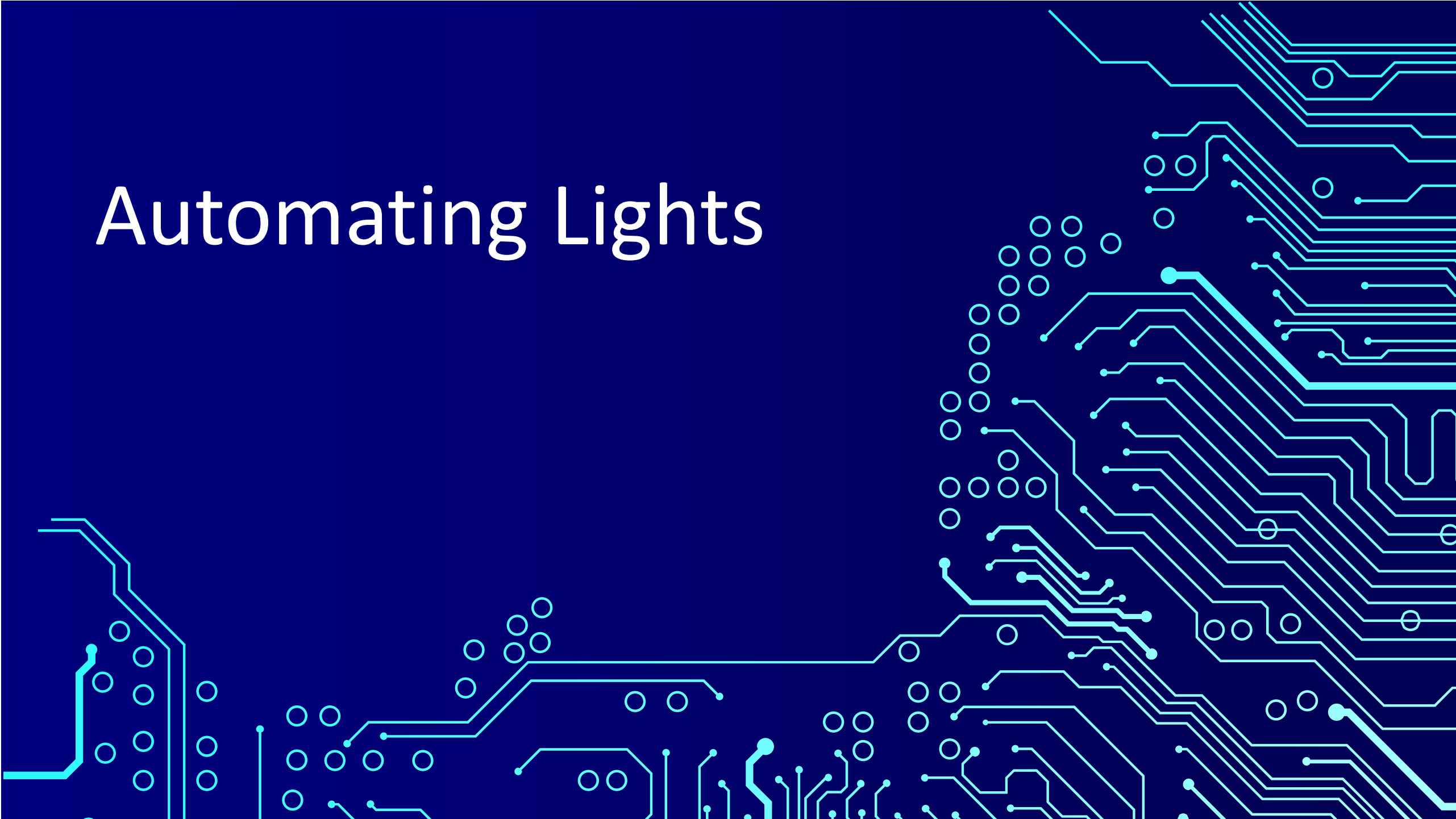
UML Sequence Diagram



Features

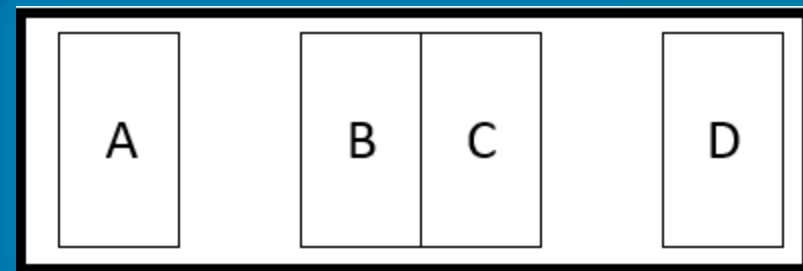
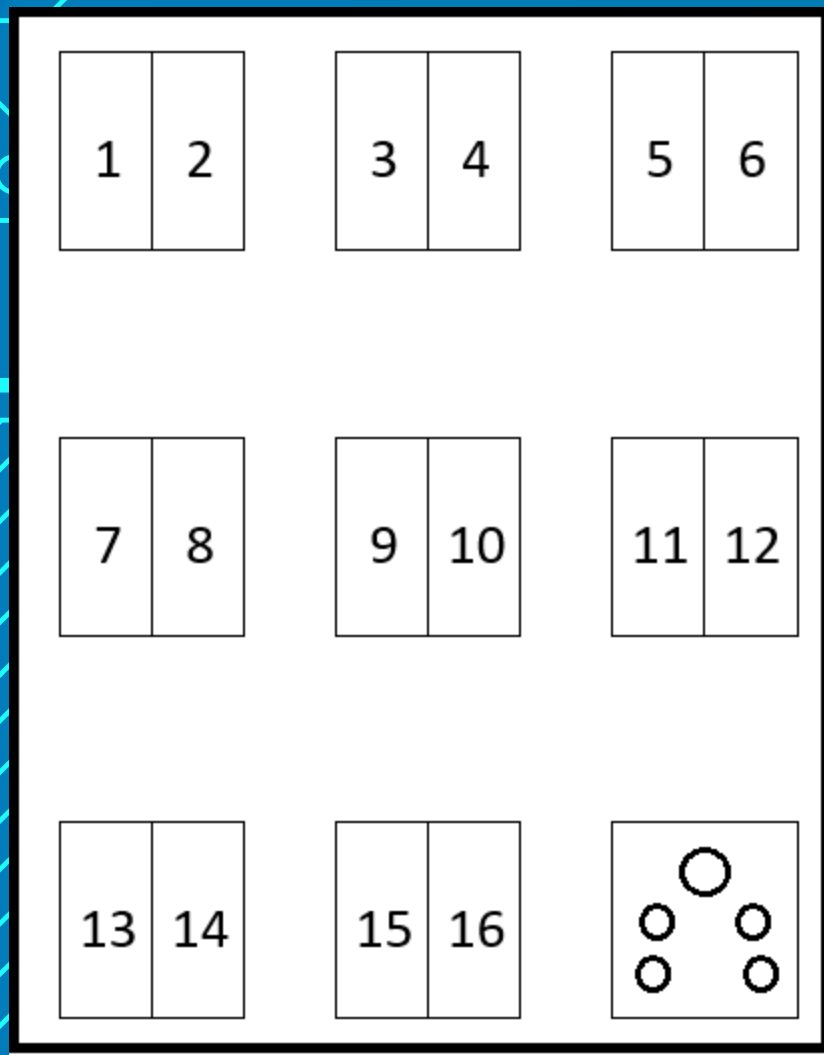


Automating Lights



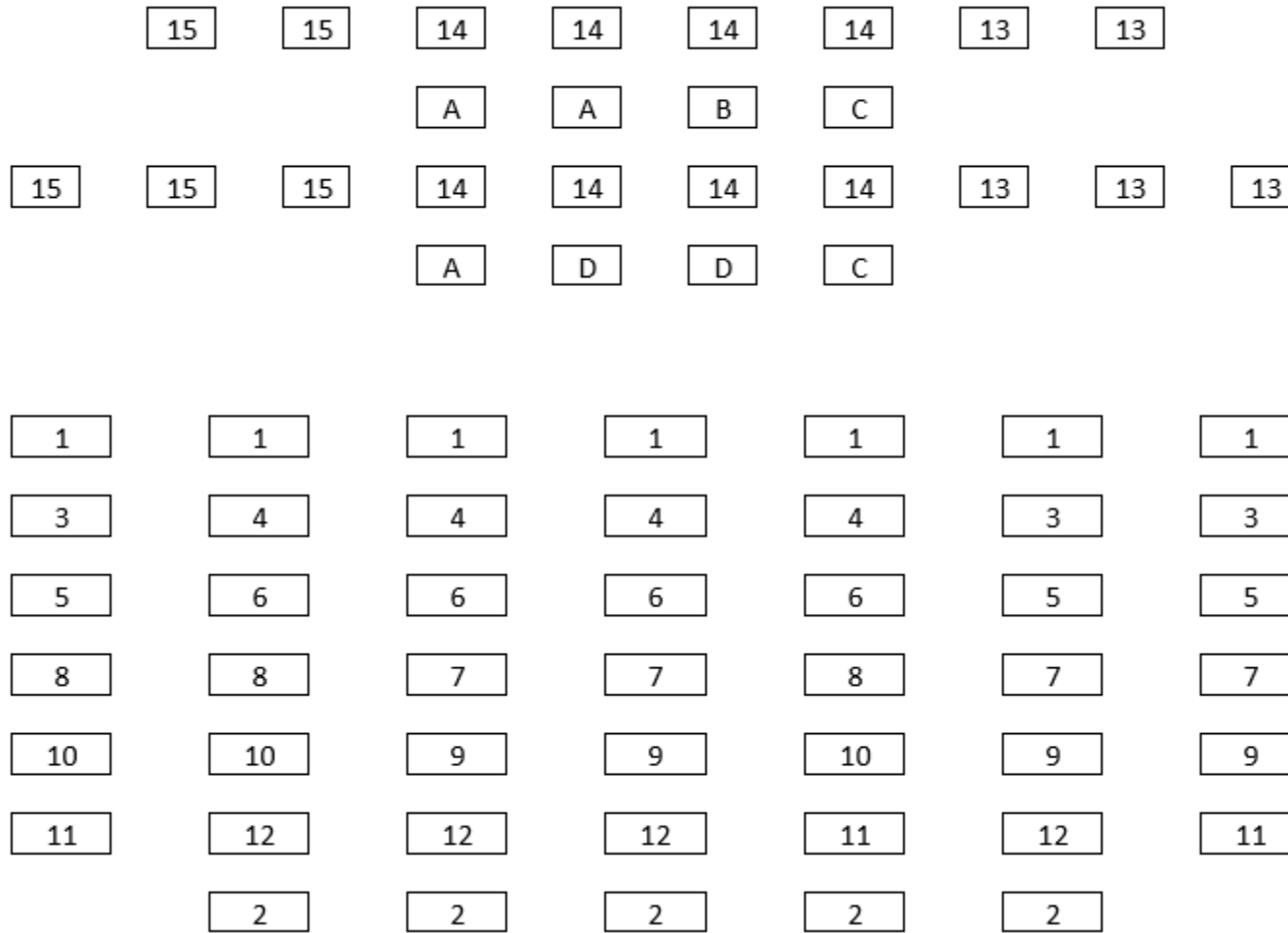
Electrical Layout Of H-105

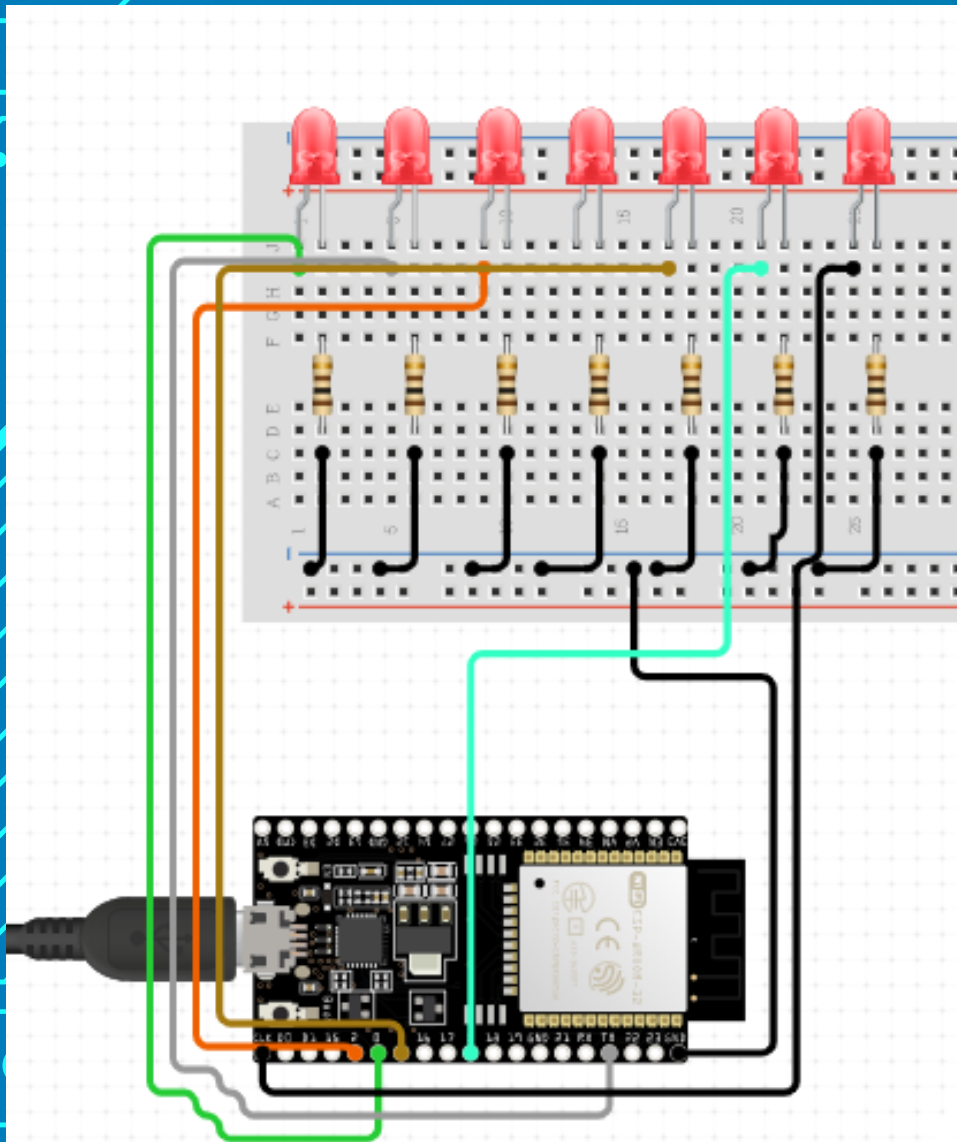
Switch Board Layout



Electrical Layout Of H- 105

Light Fixture Layout





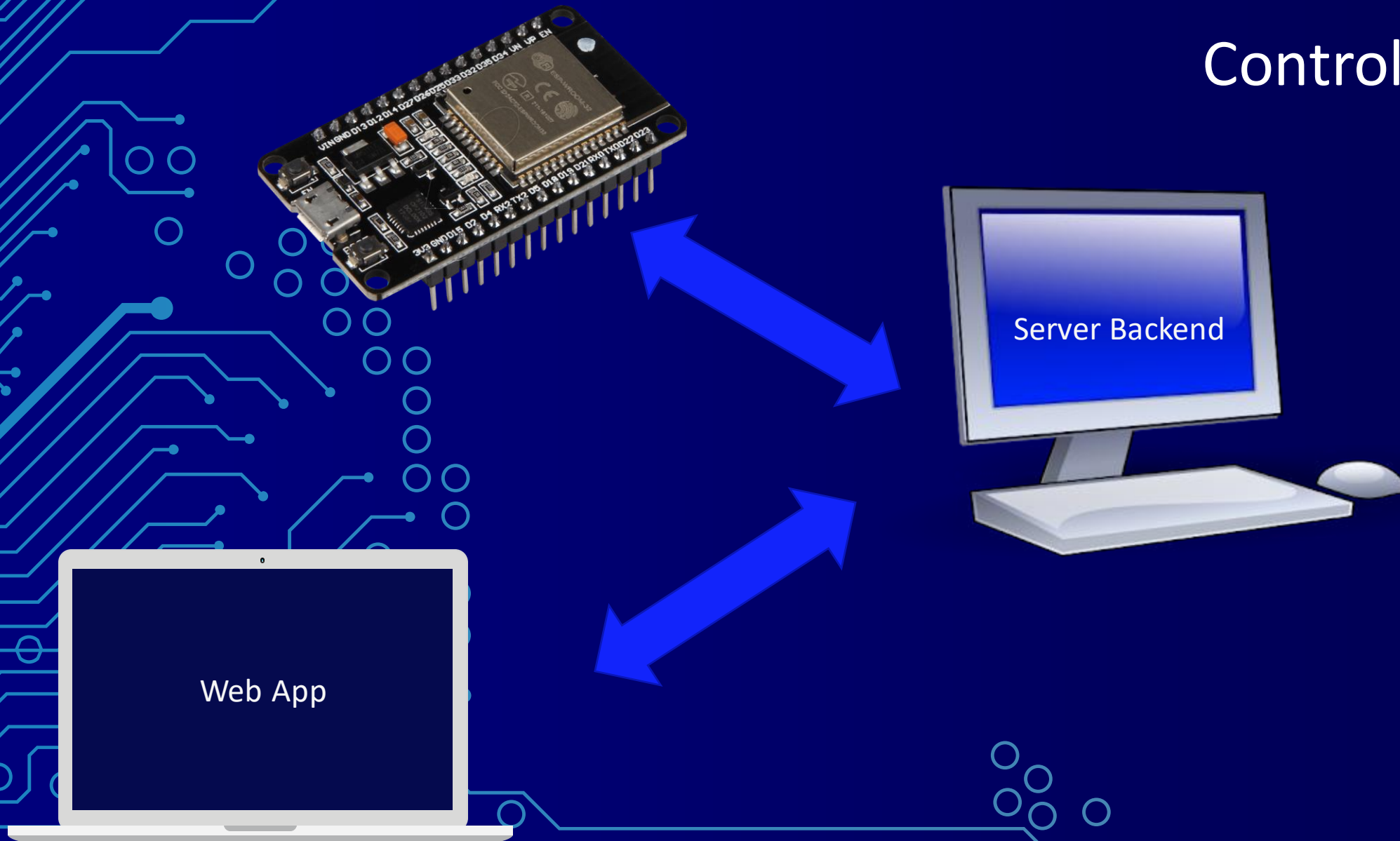
Controller Circuit

Components Used:
ESP32 Development Board
LED
Resistors
Jumper Wires



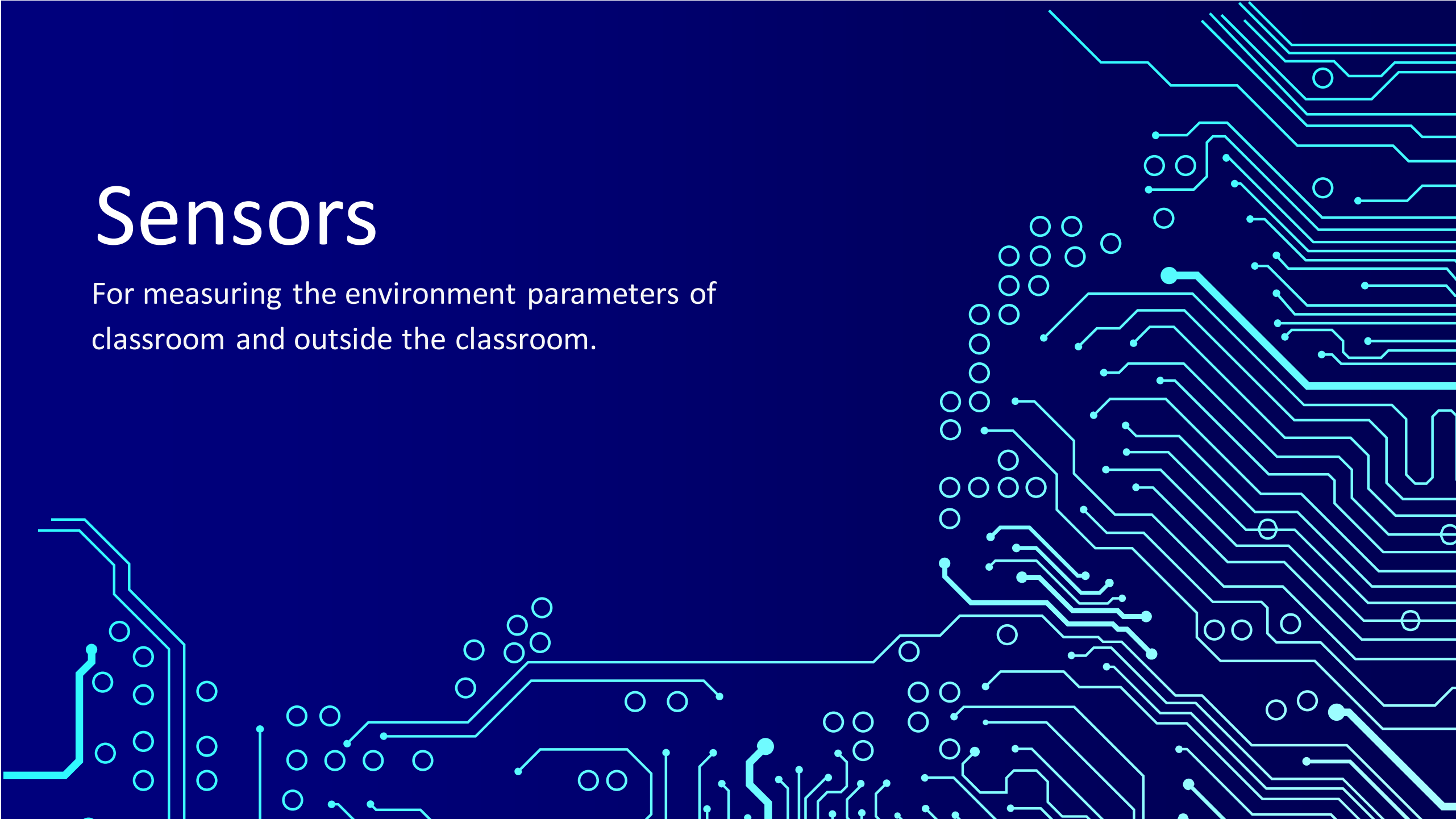
Basic Web App To Control The Lights

Control Flow



Sensors

For measuring the environment parameters of classroom and outside the classroom.





Sensors Used:

Humidity Sensor

It will be measuring the relative humidity inside the classroom and outside the classroom. And will be sending the measured data to server which will be further used to control evaporators.

CO2 Sensor

It will be measuring the CO2 inside the classroom and will send data to server which can be further used to control the evaporators and measure the occupancy of the classroom.



Sensors Used:

Energy sensors

It will measure the energy used by devices in H-105 which can be further used to analyse the efficiency of devices and hence to save the energy.

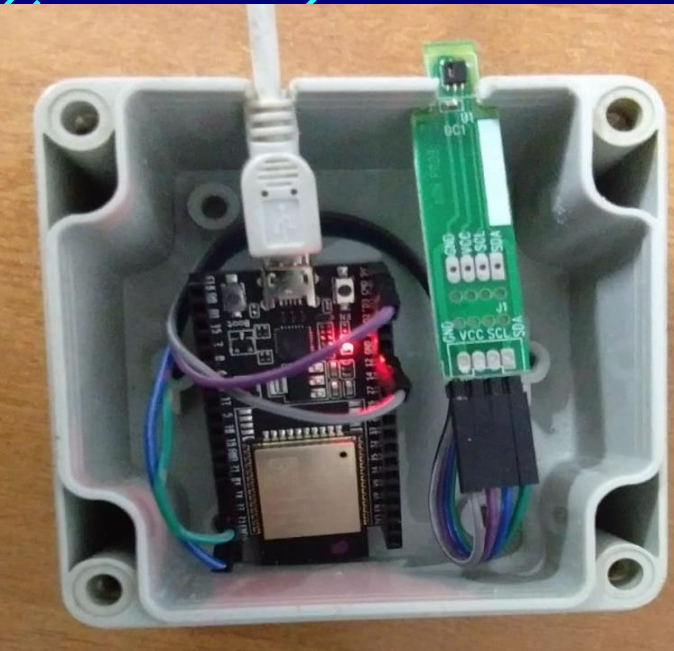
Temperature sensor

It will be measuring the temperature inside the classroom and outside the classroom. And will be sending the measured data to server which will be further used to control AC's.

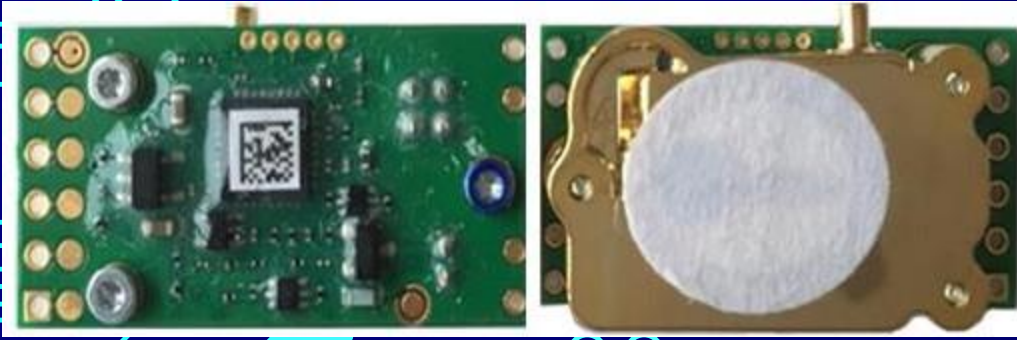
Temperature and Humidity sensor circuit

We coded on Arduino IDE and connected sensor to server to send the data on the server using API's. From where data can be used using API's.

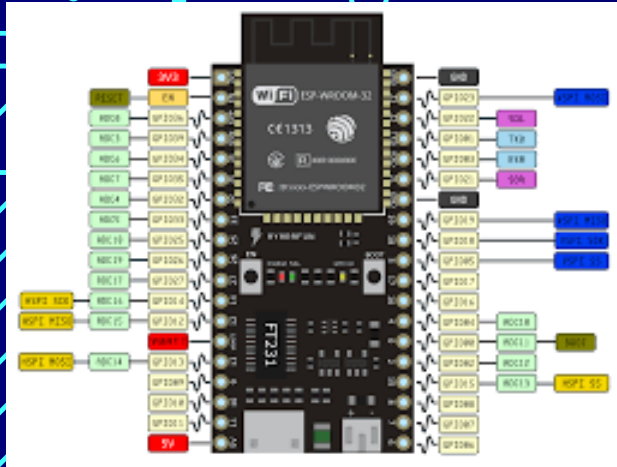
You can find data sent by circuit on this link <https://thingspeak.com/channels/1005926/>.



CO2 sensor circuit



The circuit is not working and is under development due to damaged sensors which is to be replaced by client. So no output can be found.



The background of the slide features a complex, abstract pattern of white lines and circles on a dark blue background, resembling a circuit board or a network diagram. The lines are of varying thickness and form a dense, interconnected web, particularly concentrated on the left side of the image. Small circles are scattered throughout, some appearing as nodes or components in the circuit.

Energy sensor circuit

Sensors yet to provided by client.

The background of the slide is a dark blue field filled with a complex, glowing cyan pattern that mimics a printed circuit board (PCB). This pattern consists of numerous thin, interconnected lines that branch out and curve across the frame. Interspersed among these lines are various geometric shapes, including small circles, larger open circles, and some solid dots, which represent components or vias on a circuit. The overall effect is a sense of high-tech connectivity and digital infrastructure.

Automating AC's & Projector

Projector :



AC :



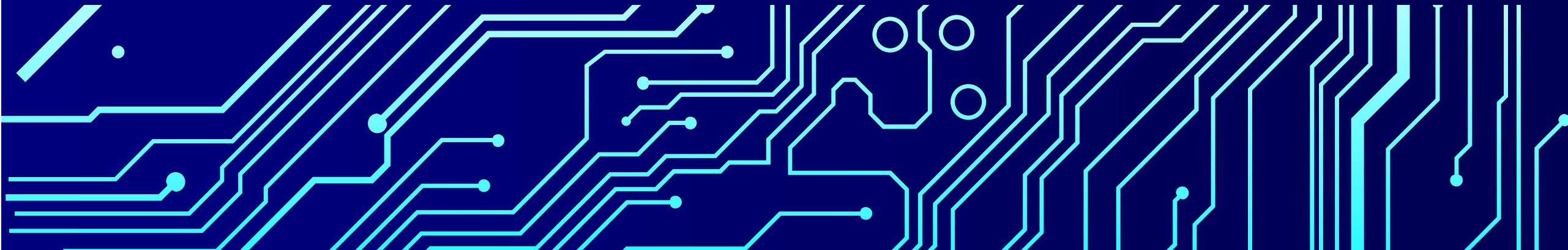
B ONE



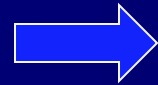
B ONE hub

B one Hub

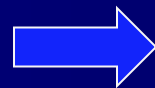
- Sends IR signals to control devices which work on remote.
- Can control various IR supported home appliances, AC's, Projectors etc.



What we did in our project ?



We made the backend in “Express js”. which makes a “POST” request on “B1 hub open API”, which further sends a signal (*or command*) to our “B1 one hub device” which further sends an “IR signal” to the device which we want to control.



Deployed on “**HEROKU**” Online web server.



FEATURES OF AC & PROJECTOR CONTROLLED THROUGH “B one HUB” & Backend :

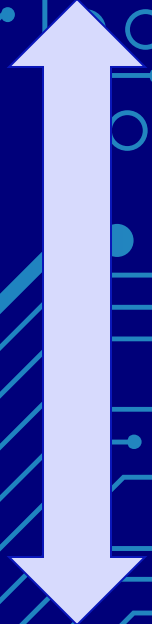
AC : *“ ON/OFF ”*

Temperature: *“ Temp + ” , “ Temp – ”*

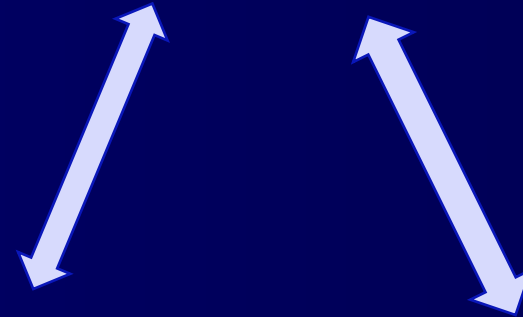
Modes : *COOL, DRY, SWING, FAN*

PROJECTOR : *“ ON/OFF ”*

B one Hub API

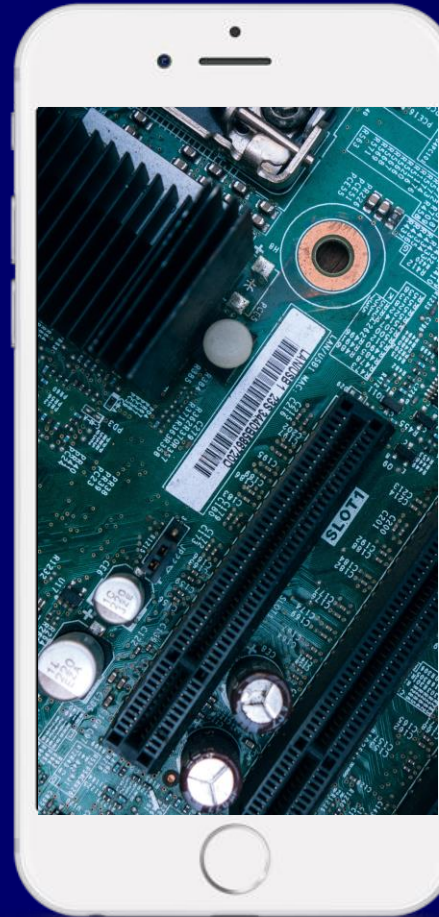


*Heroku
Post
Request*

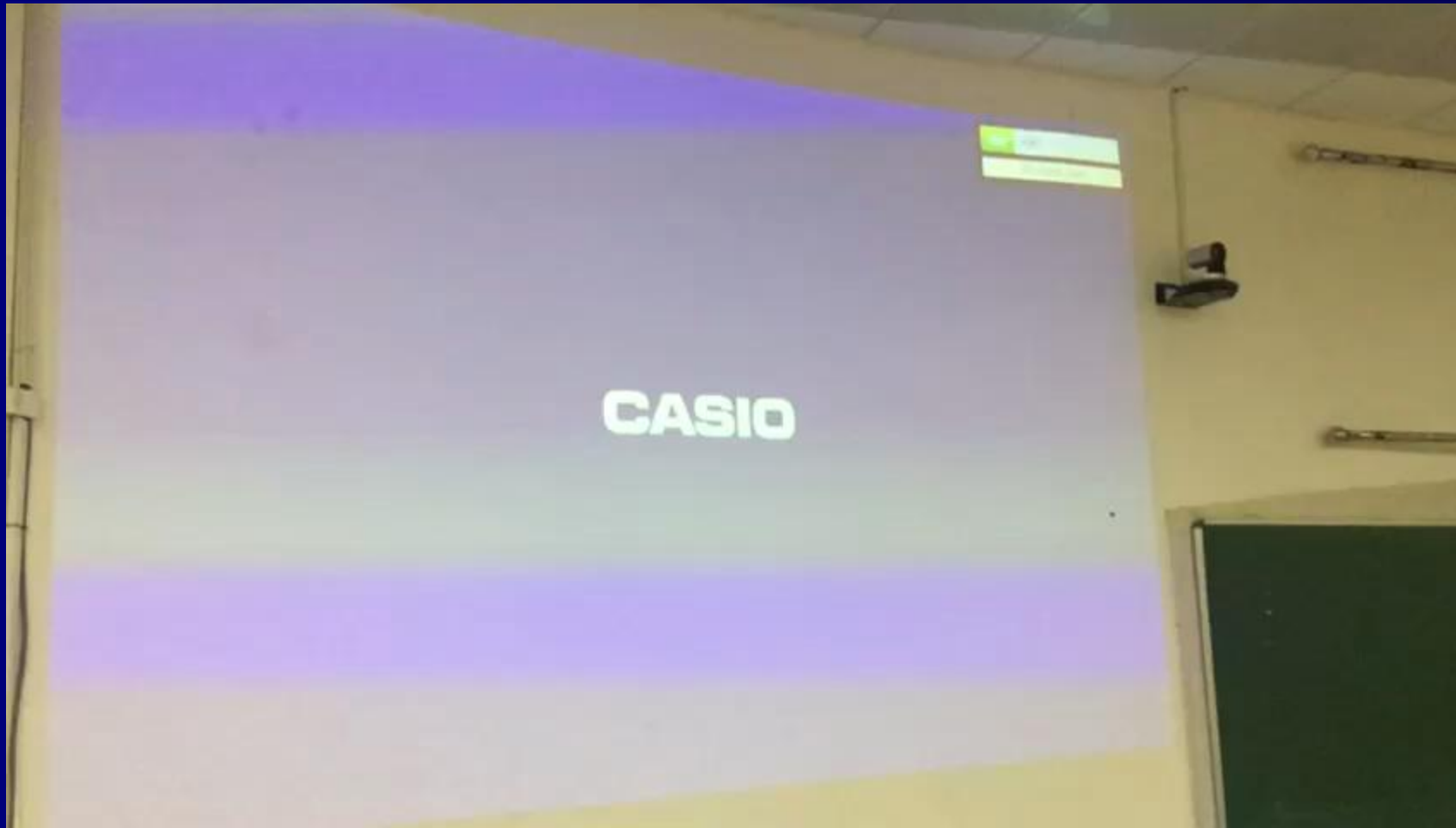


Mobile App

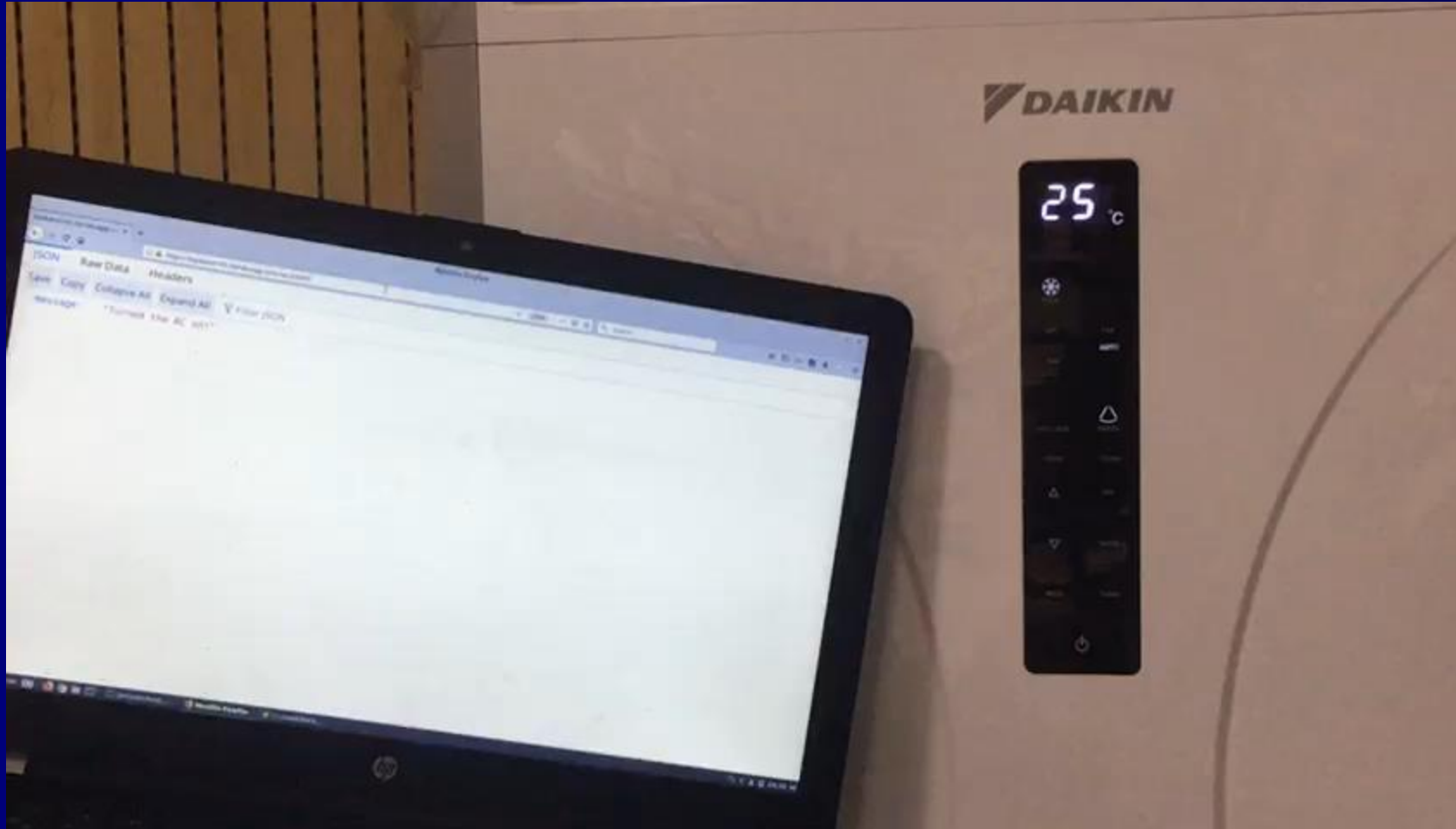
- We will be using android app to automate the devices.
- It will be done in later stages of this project.



Working proof of PROJECTOR



Working proof of AC



Client Feedback

Regarding approval for work done till R1

VV Vishal Verma
Tue 03-03-2020 14:18
vishal garg; Ramesh Loghanathan; LAKSHMI VAKADA; Akash Verma; Priyanshu Madaan; ARCHIT GOYAL; Simran Singhal

Hello sir,
We have done following things for R1 of DASS project:

- Lighting circuit is finished which can be controlled by a web page developed by us
- Temperature and Humidity sensor circuit is completed who's data pushed on sever can be seen on given link <https://thingspeak.com/channels/1005926/> .
- B1 Hub is trained with IR signals to control the AC's and Projectors of H105.
- API's to send signals from B1 Hub to AC's and Projectors to perform required operations are ready and usable in Android App which will created in second half of project.

All progress mentioned here are checked and verified by mentor from client side Simran Singhal.
Hence we require approval for our works done so for to show in R1.
Yours sincerely
Vishal Verma.

VG Vishal Garg <vishal@iiit.ac.in>
Tue 03-03-2020 19:03
Vishal Verma; Ramesh Loghanathan; LAKSHMI VAKADA; Akash Verma; Priyanshu Madaan; ARCHIT GOYAL; Simran Singhal

Approved.

Regards,
Vishal
Sent from my mobile device

Activate Windows
Go to Settings to activate Windows.

Link to R1 Presentation Video

<https://drive.google.com/file/d/1oGWTlj-5YUx9x5VTp1ge5nhLe82Atx67/view?usp=sharing>

Thank You

