



# RFID based Attendance Monitoring System

A cluster of decorative hexagonal icons is positioned in the top left corner. These icons include a lightbulb, a thumbs-up gesture, a smartphone, and a magnifying glass, all rendered in shades of blue and cyan.

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A cluster of decorative hexagonal icons is located in the bottom right corner. These icons include a speech bubble, a network of nodes, a large hexagon, and a gear, all rendered in shades of blue and cyan.



# TOPICS

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A decorative graphic on the left side of the slide. It features a large central hexagon with a blue-to-teal gradient, containing the white number '1'. Surrounding this central hexagon are several smaller hexagons of varying shades of blue and teal. Some of these smaller hexagons contain white icons: a lightbulb, a thumbs-up, a smartphone, a magnifying glass, and a gear. There is also a network-like icon with a central node and five connecting lines, and a speech bubble icon. The entire graphic is set against a dark blue background.

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# INTRODUCTION

# Proposed system

- Δ Automates the attendance taking process.
- Δ Reduces time and increases efficiency.
- Δ Enforces Security.
- Δ Scalable, easy to manage and easy to monitor.





# Reasons for adopting this System

## RFID

- ◇ Digital information.
- ◇ Unique ID.
- ◇ Contactless.
- ◇ Great response time.

## Arduino

- ◇ Open-source.
- ◇ Widely used.
- ◇ Cheap.
- ◇ Easy to program & debug.

## Implementing IoT

- ◇ Digitalization of the process.
- ◇ Complete monitoring over the internet.
- ◇ Very little human effort required.

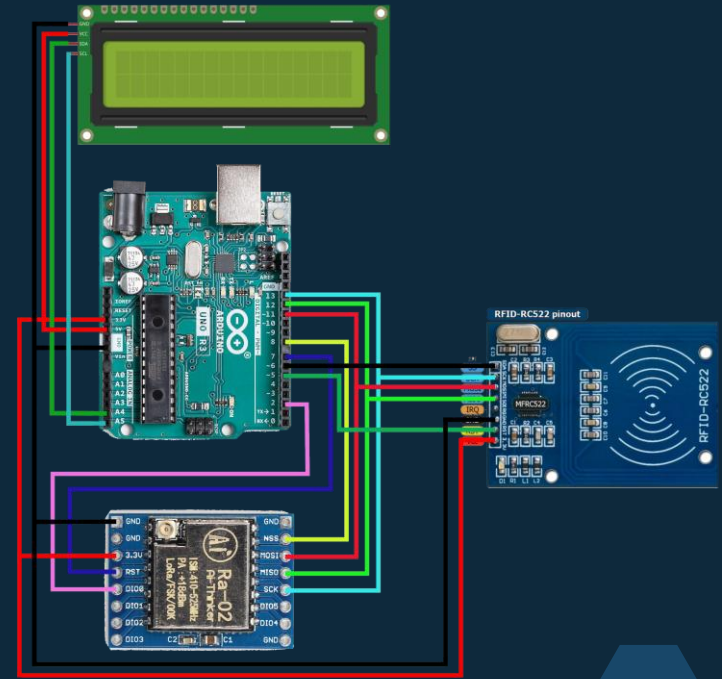
A decorative graphic on the left side of the slide. It features a large central hexagon with a blue-to-teal gradient, containing the number '2'. Surrounding this central hexagon are several smaller hexagons of varying shades of blue and teal. Some of these smaller hexagons contain white icons: a lightbulb, a thumbs-up, a smartphone, a magnifying glass, and a gear. There is also a network-like icon with a central node and radiating lines, and a speech bubble icon. The entire graphic is set against a dark blue background.

2

# THEORY

# Technology Used

- ❑ RC522 RFID reader is used for reading information from the RFID tags/cards.
- ❑ Arduino Uno or Nano is used as the microcontroller.
- ❑ LoRa is used as the communication layer and protocol.
- ❑ LCD is used to display the necessary information for visual aid.







# RFID



# Arduino



- ❑ Provides an **Unique** ID.
- ❑ **Open-source** in hardware and software and **Inexpensive**.
- ❑ **Line of Sight** not required.
- ❑ **Does not require** an external programmer.
- ❑ **Contactless** information sharing.
- ❑ Arduino IDE is **supported in almost every OS**.
- ❑ **Battery-less** operation.
- ❑ **Ease of Programming**.
- ❑ Can detect **through obstacles**.
- ❑ A very **large and growing community**.



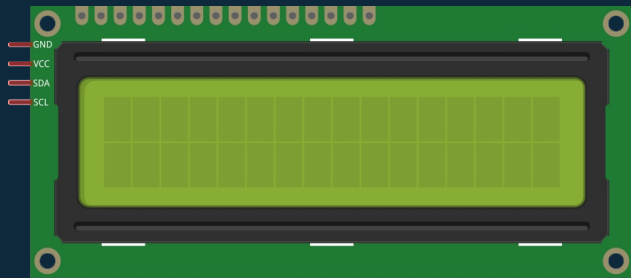


- ❑ It has **deep indoor coverage** and provides long range capabilities.
- ❑ **Low-power** optimised, very suitable for battery operated IoT applications.
- ❑ **Low-cost** end node. Hence, provides a cheap yet strong communication possibilities.
- ❑ **High capacity**. Millions of messages per base station / gateway.



# LCD

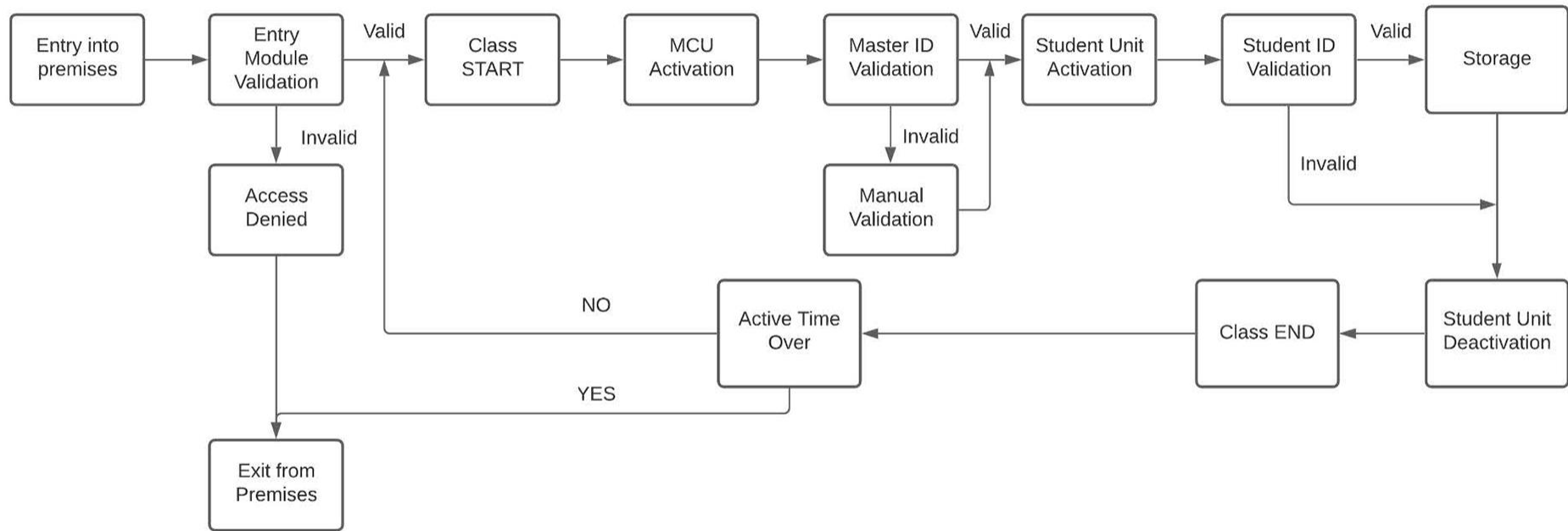
- ❑ It can display 16 characters in a single line.
- ❑ It can display 2 such lines at once.
- ❑ It is helpful to understanding the current status of the process.
- ❑ It provides visual info to the user for better interactivity.



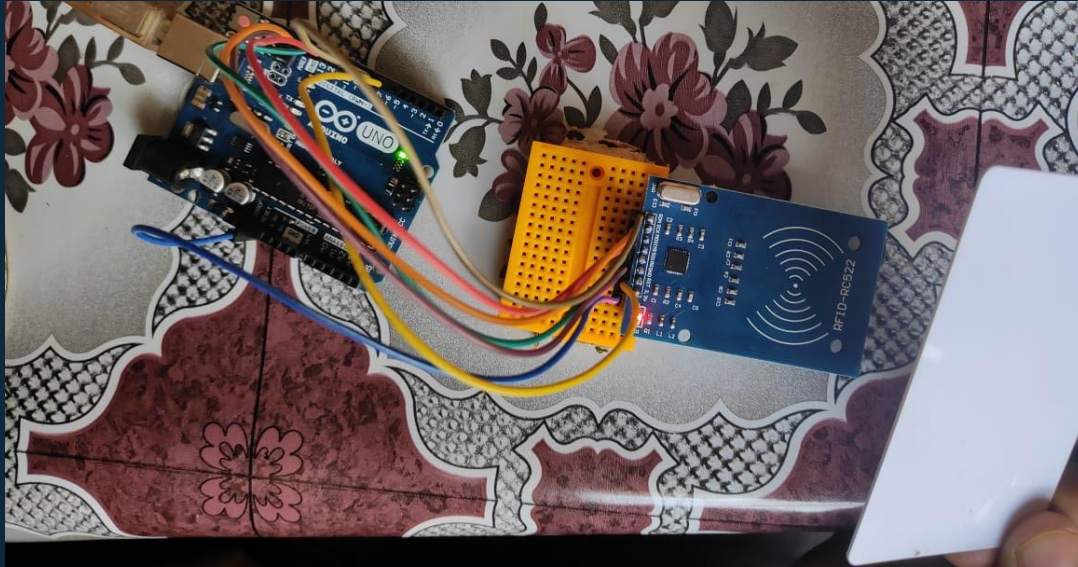
A decorative graphic on the left side of the slide. It features a large central hexagon with a blue-to-teal gradient, containing the number '3'. Surrounding this central hexagon are several smaller hexagons of varying shades of blue and teal. Some of these smaller hexagons contain white icons: a lightbulb, a thumbs-up, a smartphone, a magnifying glass, and a gear. There is also a network-like icon with a central node and radiating lines, and a speech bubble icon. The entire graphic is set against a dark blue background.

3

WORKING



# Reading info from RFID Card



```
COM5

Starting the RFID Reader...
234420852
234420852
```

☒ Autoscroll ☐ Show timestamp

Picture showing the RFID reader detecting and printing the Tag value.

# Communicating using LoRa

The LoRa module is used to send and receive data packets to and from end nodes.

The same is shown below:

```
COM4

LoRa Sender
Sending packet: 0
Sending packet: 1
Sending packet: 2
Sending packet: 3
Sending packet: 4
Sending packet: 5
Sending packet: 6
Sending packet: 7
Sending packet: 8
Sending packet: 9
Sending packet: 10
```

Figure showing LoRa sending data packets

```
COM3

LoRa Receiver
Received packet 'hello beta 1' with RSSI -121
Received packet 'hello alpha 32' with RSSI -121
Received packet 'hello beta 2' with RSSI -121
Received packet 'hello alpha 33' with RSSI -122
Received packet 'hello beta 3' with RSSI -121
Received packet 'hello alpha 34' with RSSI -121
Received packet 'hello beta 4' with RSSI -122
Received packet 'hello alpha 35' with RSSI -122
Received packet 'hello beta 5' with RSSI -122
Received packet 'hello alpha 36' with RSSI -122
Received packet 'hello beta 6' with RSSI -121
Received packet 'hello alpha 37' with RSSI -122
Received packet 'hello beta 7' with RSSI -121
Received packet 'hello alpha 38' with RSSI -122
Received packet 'hello beta 8' with RSSI -121
Received packet 'hello alpha 39' with RSSI -122
Received packet 'hello beta 9' with RSSI -121
Received packet 'hello alpha 40' with RSSI -122
```

Figure showing LoRa receiving data packets

# Customising the LCD

We are able to customise the LCD based on our needs like:

- ❑ Displaying a **Welcome message**.
- ❑ **Status** of the process.
- ❑ Necessary **numbers and values**.







A decorative graphic on the left side of the slide. It features a large, light blue hexagon with the number '4' inside. Surrounding this central hexagon are several smaller hexagons of varying shades of blue and teal. Some of these smaller hexagons contain white icons: a lightbulb, a thumbs-up, a smartphone, a magnifying glass, and a gear. There is also a network-like icon with a central node and several smaller nodes connected by lines.

4

# CONCLUSION



# Points to bring forward

## Automation

- ◇ Saves time.
- ◇ Reduces errors.
- ◇ Less human effort.

## Low Cost

- ◇ Most of the components and software are open-source.
- ◇ Relatively cheaper than other comparable/similar technologies available.

## Better Operability

- ◇ Simple Interface.
- ◇ Easy to use & operate.
- ◇ Abstract design.

## Advantageous

- ◇ Digitalization of data.
- ◇ Low response time.
- ◇ Simultaneous registering of attendance.

## Low maintenance

- ◇ Battery operated.
- ◇ Very low power consuming components and techniques.

## Future Scope

- ◇ Adopt in other organisation to cater their needs.
- ◇ Include parts to enhance or change certain requirements.

THANK YOU 

