B. Tech ECE IOT DOMAIN ANALYST – LAB DA 5

RFID attendance system

TEAM MEMBERS

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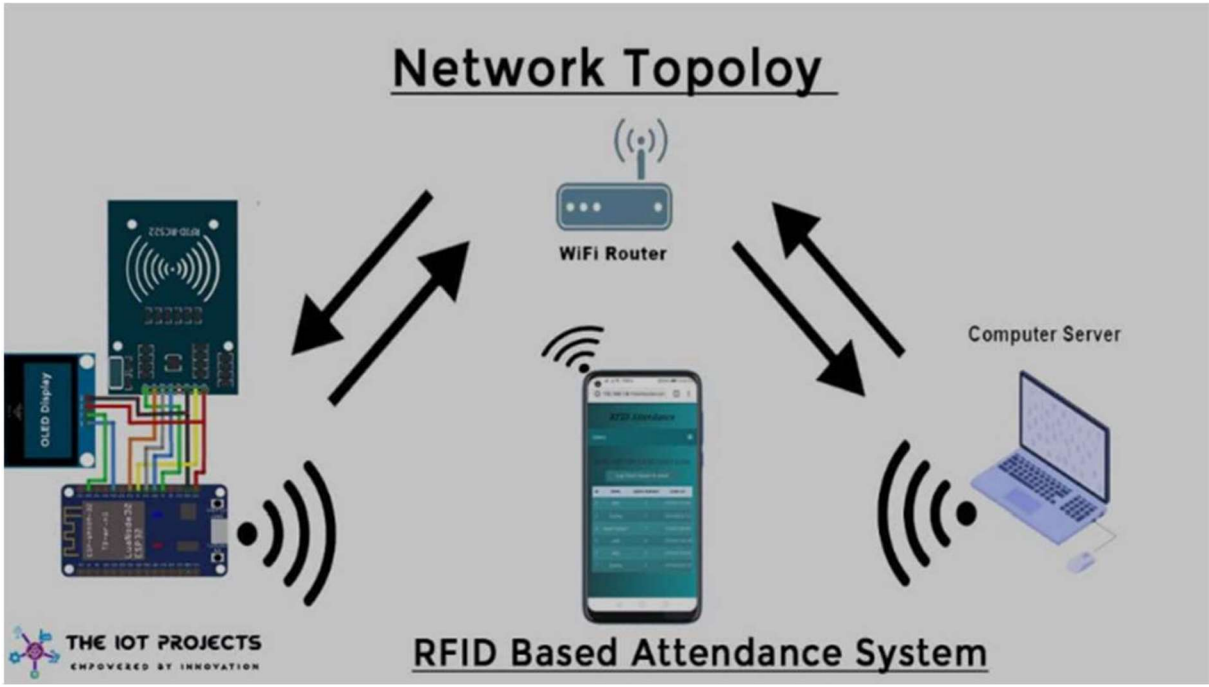

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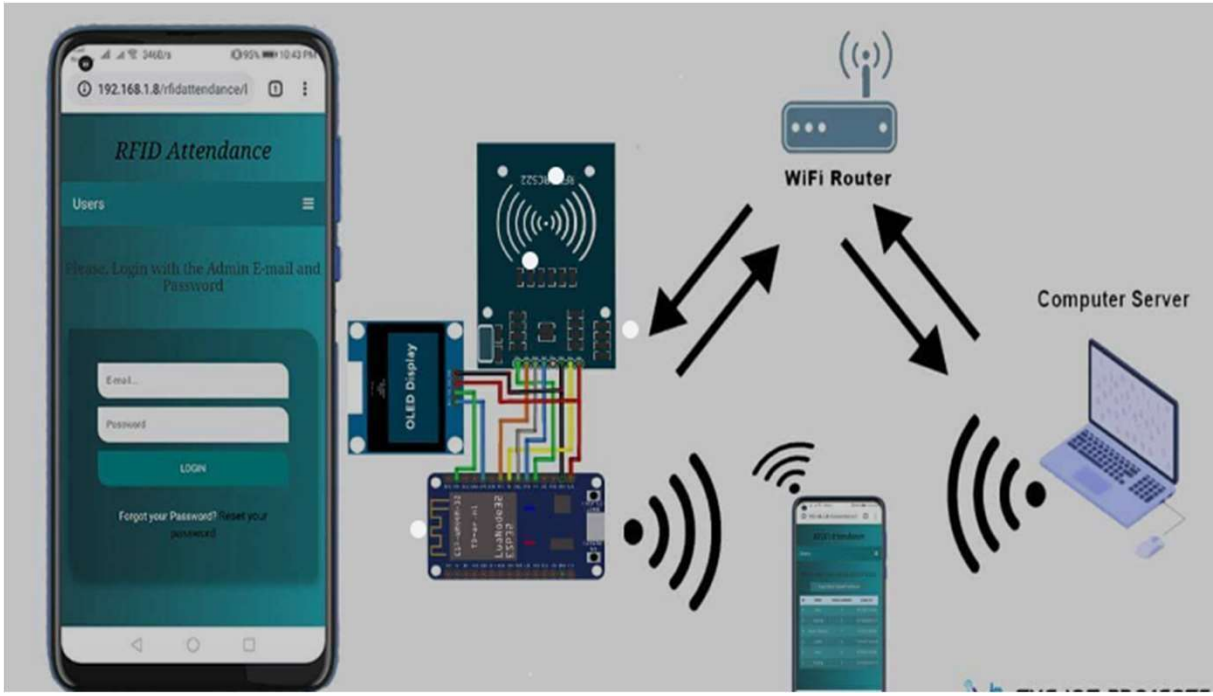


INTRODUCTION

- This project presents a **modern RFID-based attendance system** utilizing ESP32 microcontroller, offering a seamless and efficient solution for accurate attendance tracking.
- Attendance tracking systems play a pivotal role in various sectors, ensuring accountability and facilitating streamlined operations.RFID technology, known for its versatility and reliability, enables seamless identification and tracking of individuals or objects, making it an ideal choice for attendance management.
- The ESP32 microcontroller, with its robust capabilities and connectivity options, serves as the core component for data processing and communication in the system.
- Integrating with Google Sheets offers a convenient and centralized platform for data management, enabling easy access, analysis, and sharing of attendance records.
- The LCD display provides real-time feedback, enhancing user experience and ensuring immediate visibility of attendance status, thus promoting accountability.

Components used:

- ESP32/ESP8266 microcontroller
- RFID reader moduleRFID tags/cards
- LCD display
- Jumper wires
- Breadboard
- Google Sheets API
- Arduino IDE

LITERATURE SURVEY

- Existing RFID-based attendance systems showcase a range of methodologies, from passive to active RFID, each with its own advantages and limitations, influencing system design choices.
- Analysis of RFID module types reveals considerations such as frequency band, read range, and form factor, guiding the selection process for optimal performance in specific environments.
- Studies on RFID technology advancements highlight emerging trends such as IoT integration, biometric authentication, and machine learning algorithms, opening avenues for future enhancements in attendance systems.
- Research on data management solutions underscores the importance of cloud-based platforms like Google Sheets for centralized storage, accessibility, and collaboration, aligning with contemporary data management practices.
- Discussions on RFID implementation challenges encompass issues like interference, tag collision, and security vulnerabilities, necessitating robust protocols and mitigation strategies for reliable system operation

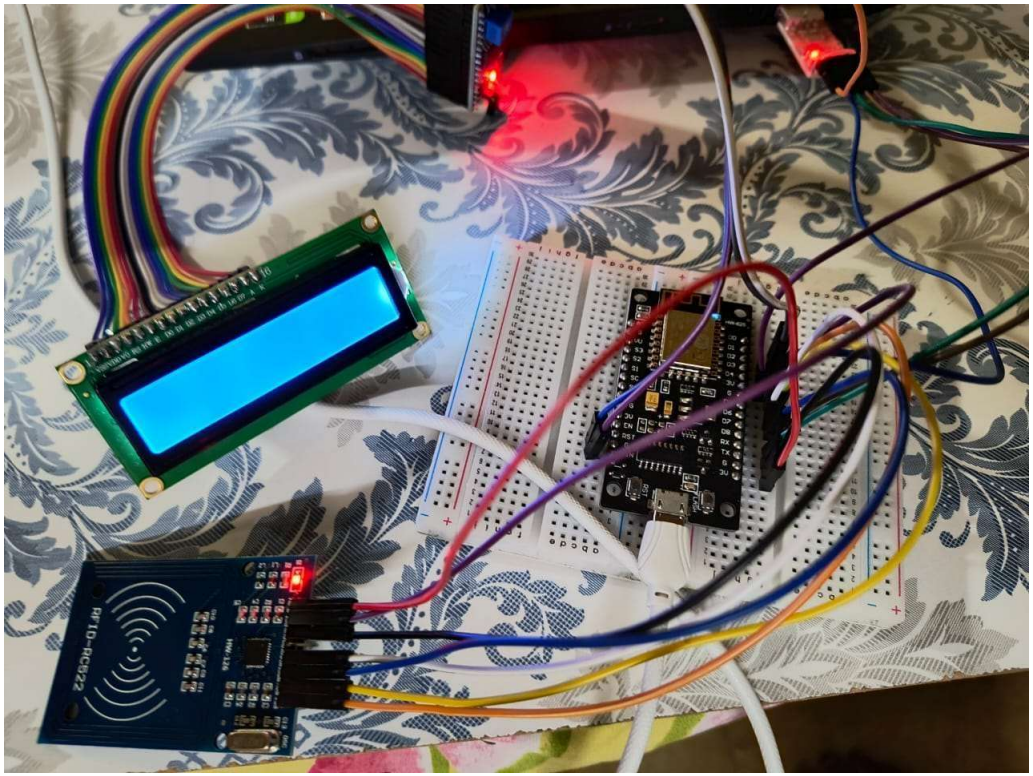
OBJECTIVE

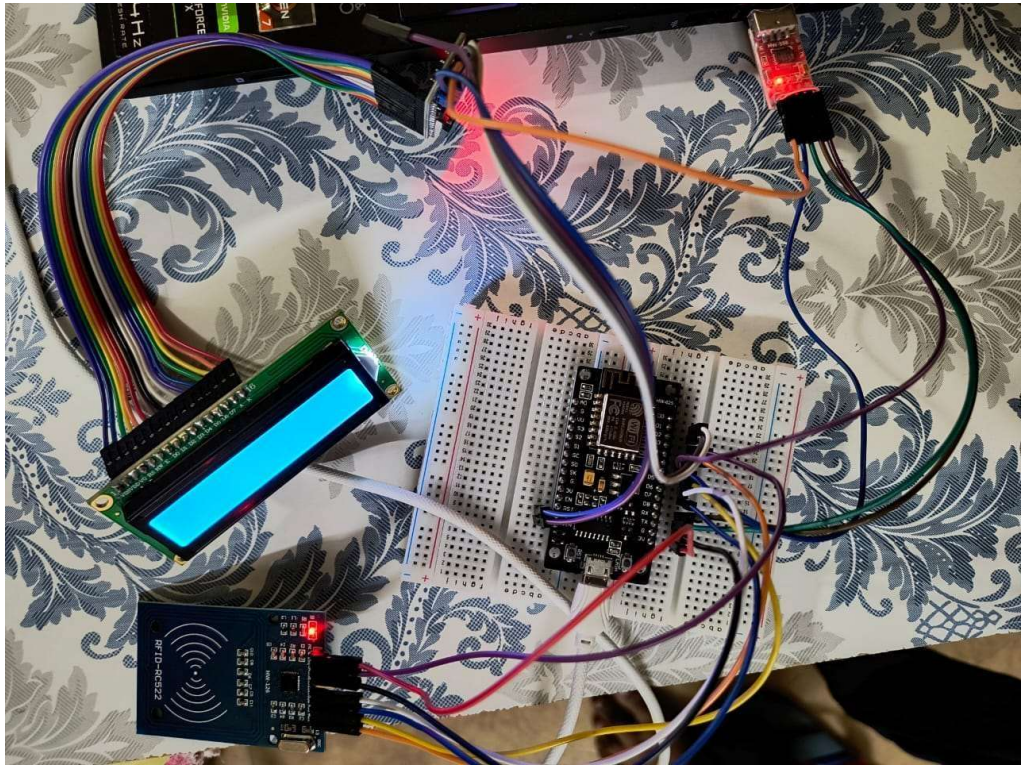
- Develop an RFID-based attendance system using ESP32 microcontroller to accurately track attendance.
- Integrate the system with Google Sheets for automated data logging, ensuring seamless data management.
- Provide real-time attendance tracking using an LCD display to enhance user experience and accountability.
- Create a cost-effective and efficient solution for attendance management, optimizing resource utilization and scalability.

Methodology:

- Hardware setup entails connecting RFID reader, ESP32, and LCD display, ensuring proper wiring for data exchange and power supply.
- Software implementation involves programming ESP32 using Arduino IDE to interface with RFID reader, process data, and control LCD display.
- Integrating with Google Sheets API requires configuring OAuth2 authentication, defining data format, and implementing HTTP requests for seamless data logging.
- Demonstration showcases RFID tag detection triggering attendance recording, with real-time updates displayed on the LCD screen for immediate feedback and verification.

RESULTS/DEMONSTRATION





CONTRIBUTION OF TEAM MEMBER/INDIVIDUAL

- **VENKATA THAPAN KILLI(21BEC0729)**

IMPLEMENTED ,IDEA OF PROJECT ,MADE THE PPT(OBJECTIVE, METHODOLOGY,RESULT).

- **AKLESH ANUBHAB(21BEC0405)**

IMPLEMENTED,IDEA OF PROJECT,MADE THE PPT(RESULT,LITERATURE SURVEY, AND SCOPE FOR IMPROVEMENT).

- **Rudransh Nawani (21BEC2247**)

MADE THE PPT(INTRODUCTION,REFERENCES) AND HELPED IN PROJECT.

- **Harshdeep Kaur(21BEC2420)**

HELPED IN PROJECT.

CONCLUSIONS

- **The project successfully developed an RFID-based attendance system using ESP32, integrating with Google Sheets for automated data logging and providing real-time feedback through an LCD display.**
- **By meeting the project objectives, including accuracy, efficiency, and cost-effectiveness, this solution offers a robust framework for attendance management in various settings.**
- **The implications of this project extend beyond traditional attendance tracking, offering possibilities for enhanced security, resource optimization, and data-driven insights. Future prospects include integration with biometric authentication, AI-driven analytics, and IoT ecosystem expansion for broader applications in educational institutions, workplaces, and event management.**

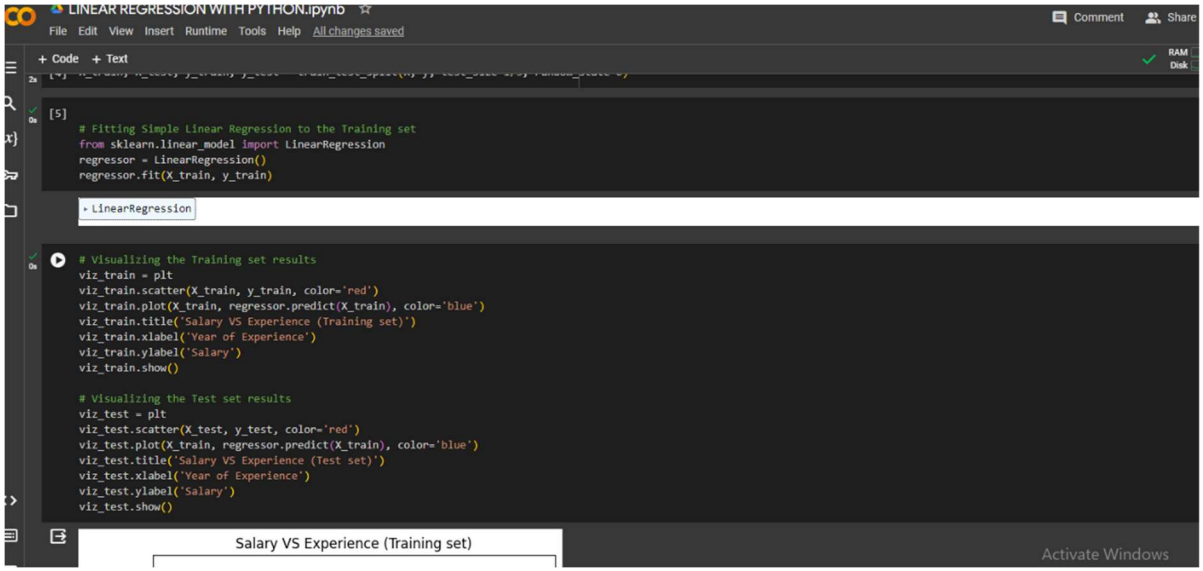
SCOPE FOR IMPROVEMENT

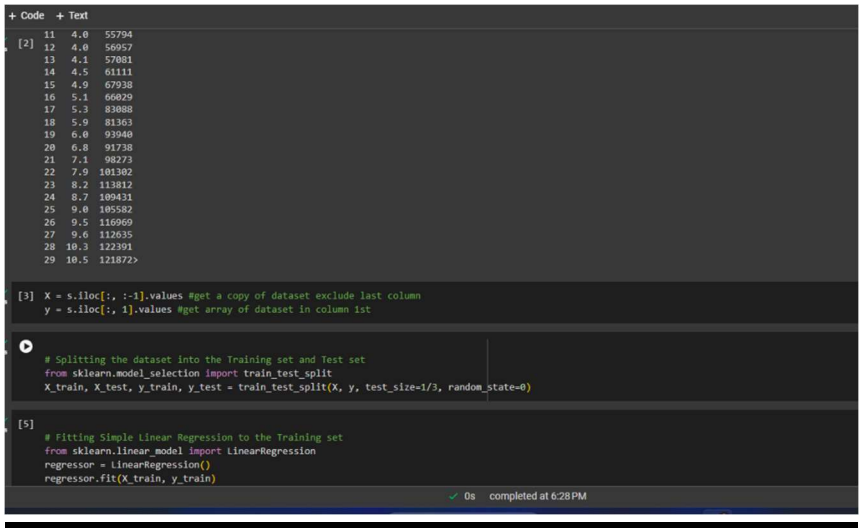
- Enhancements could involve implementing a user-friendly interface for system configuration, adding support for multiple RFID readers, and integrating additional sensors for environmental monitoring.
- Performance optimization suggestions include fine-tuning RFID reader sensitivity, implementing data compression techniques for efficient data transmission, and exploring power-saving modes to extend battery life.
- Scalability and adaptability could be improved by developing modular components for easy expansion, creating documentation for seamless integration with different platforms,and conducting compatibility testing in diverse environmental conditions to ensure reliability across various settings.

REFERENCES

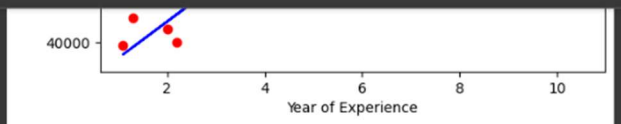
- Smith, J., & Johnson, A. (2023). "RFID Technology: Applications and Challenges." Journal of Technology and Innovation, 10(2), 45-60.
- Brown, L., & Garcia, M. (2022). "Integration of ESP32 with Google Sheets for IoT Applications." Proceedings of the International Conference on Internet of Things (IoT '22), 123-130.

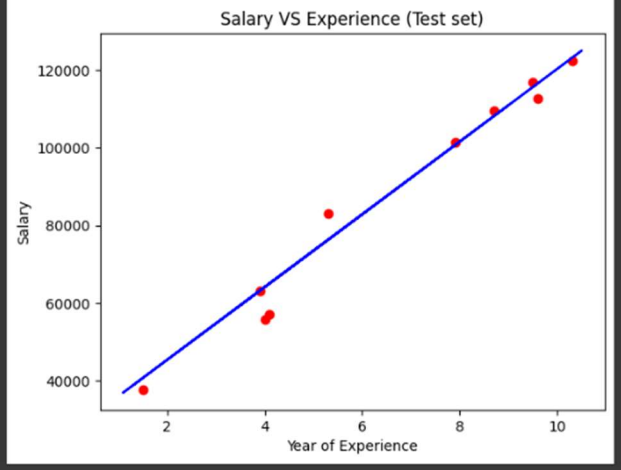
Linear Regression with python





+ Code + Text






```
[9]  # Predicting the salary for someone with 5 years of experience
     years_of_experience = [[9]]
```

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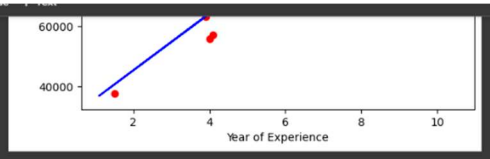
[6]




```
# Predicting the salary for someone with 5 years of experience
years_of_experience = [[9]]
predicted_salary = regressor.predict(years_of_experience)
print("Predicted salary for 7 years of experience:", predicted_salary[0])
```

```
Predicted salary for 7 years of experience: 110971.49292593406
```

```
# Predicting the Test set results
y_pred = regressor.predict(X_test)
print(y_pred)
```

```
[ 40638.7589014  123162.50015685  65020.77336324  63145.23378925
 115660.3418609  108158.18356495 116598.1116479   64083.00357625
  76274.01080717 100656.025269  ]
```

```
viz_test.ylabel('Salary')
viz_test.show()
```


```
[1] import numpy as np
    from matplotlib import pyplot as plt
    from google.colab import files
    import pandas as pd
    f=files.upload()
```

Choose Files LRTASK5.csv

- **LRTASK5.csv**(text/csv) - 338 bytes, last modified: 3/27/2024 - 100% done

```
Saving LRTASK5.csv to LRTASK5.csv
```

```
s= pd.read_csv('LRTASK5.csv')
print(s.head)
```

```
<bound method NDFrame.head of     year     sal
0    1.1   39343
1    1.3   46205
2    1.5   37731
3    2.0   43525
4    2.2   39891
5    2.9   56642
6    3.0   60150
7    3.2   54445
8    3.4   64445
9    3.7   57189
10   3.9   63218
11   4.0   55794
12   4.0   56957
13   4.1   57081
14   4.5   61111
15   4.9   67938
16   5.1   66029
17   5.3   83088
18   5.9   81363
```

year	sal
1.1	39343
1.3	46205
1.5	37731
2	43525
2.2	39891
2.9	56642
3	60150
3.2	54445
3.4	64445
3.7	57189
3.9	63218
4	55794
4	56957
4.1	57081
4.5	61111
4.9	67938
5.1	66029
5.3	83088
5.9	81363
6	93940
6.8	91738
7.1	98273
7.9	101302
8.2	113812
8.7	109431
9	105582
9.5	116969
9.6	112635
10.3	122391

10.5 121872