VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Belgaum, Karnataka-590014

Mini Project Report On

"Secure RFID/NFC-Based Smart Lock System with AES-Encrypted Access Logging Using ESP32"

Submitted in partial fulfillment of the requirement for the 6th Semester

BACHELOR OF ENGINEERING

CSE – IOT & Cyber Security Including Blockchain Technology

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CERTIFICATE

Certified that the mini project work entitled "**Secure RFID/NFC-Based Smart Lock System with AES-Encrypted Access Logging Using ESP32**" carried out by **MUTHYALA SAI RITHVIK(1SP21IC034),SHASHANK N U(1SP21IC054),VARSHITH KUMAR N (1SP21IC060) and VISMAYA S R (1SP21IC061)** we bonafied student of S.E.A. College of Engineering & Technology, in partial fulfillment for the 6th semester of Bachelor of Engineering in Computer Science and Engineering(IoT & CSBT) department of the Visvesvaraya Technological University, Belgaum during the year 2023-2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The mini project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Prof.DHIVYA G	**Dr. SUKESH H A**	**Dr. B VENKATA NARAYANA**
Signature of the Guide	Signature of the HOD	Signature of the Principal

External Examiner Signature with date

1.

2.

DECLARATION

We, the students of final semester of Computer Science and Engineering(IoT & CSBT), S.E.A. COLLEGE OF ENGINEERING & TECHNOLOGY, BANGALORE–49, declare that the work entitled "**Secure RFID/NFC-Based Smart Lock System with AES-Encrypted Access Logging Using ESP32**" has been successfully completed under the guidance of Prof. Shreya Kumari, Computer Science Department(IoT & CSBT), S.E.A. COLLEGE OF ENGINEERING & TECHNOLOGY, BANGALORE. This dissertation work is submitted to Visvesvaraya Technological University in partial fulfillment of the requirements for the award of Degree of Bachelor of Engineering in Computer Science and Engineering(IoT & CSBT) during the academic year 2023 - 2024. Further the matter embodied in the project report has not been submitted previously by anybody for the award of any degree or diploma to any university.

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ABSTRACT

This project investigates the development of a secure RFID/NFC-based smart lock system utilizing the ESP32 microcontroller and Advanced Encryption Standard (AES) encryption for access logging. The proposed system aims to enhance security and user convenience by integrating RFID/NFC technology, allowing for keyless entry while ensuring that only authorized individuals can gain access. Key features of the system include robust encryption for data confidentiality, real-time logging for audit capabilities, and secure user authentication through RFID/NFC credentials.

The project emphasizes the importance of data protection in smart lock systems, addressing vulnerabilities associated with traditional mechanical locks and existing electronic systems. By employing AES encryption, the system guarantees that access logs remain tamper-proof and confidential, safeguarding sensitive information from unauthorized access. Additionally, the project explores the implementation of automated tasks and HMAC for data integrity, further strengthening the security framework.

The setup process for the smart lock system is detailed, highlighting the integration of hardware and software components necessary for a reliable and scalable access control solution. The objective is to demonstrate the effectiveness of this smart lock system as a comprehensive security solution, showcasing its potential applications in residential, commercial, and community settings while prioritizing user privacy and data security. This abstract encapsulates the project's goals, methodologies, and expected outcomes, providing a concise overview of the endeavor to create a state-of-the-art smart lock system.

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