**DIGITAL LOGICS AND DESIGN**

**PROJECT**

**CAR SECURITY SYSTEM**

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PROBLEM STATEMENT

Design and Implementation of an Advanced Digitally-Controlled Smart Car Security System using hardware components

INTRODUCTION

The conventional approaches to safeguarding automobiles often fall short in preventing unauthorized access and deterring theft, necessitating the development of a more sophisticated security paradigm. In response to this pressing need, the Smart Car security system is designed, employing digital logic gates, crucial components, and innovative circuitry to create a robust and user-centric security mechanism.

**Functionality:**

* It will prevent unauthorized access, trigger alarms in breach attempts, and offer visual feedback using LED indicators.

**Implementation**

The Smart Car security system is designed using ICs such as the 7404 NOT gate and 7408 AND gate, alongside essential components like LED lights, a buzzer, resistors, a breadboard, and a capacitor (16V, 100mF), powered by a battery and connected via wires as needed. The IC 7404-NOT gate is employed to invert the input signal, allowing for a logical conversion essential for the security mechanism. The IC 7408-AND gate is used to process the logic of multiple inputs, controlling the authentication and access protocols of the

security system.

### Resistors are employed in the circuit design to regulate the flow of current, ensuring component safety and functionality. The capacitor acts as a filter, stabilizing the power supply.

The circuit is designed to prevent unauthorized access to the vehicle and enable engine start only for authenticated users. The NOT gate manipulates the input signal, ensuring that only verified inputs trigger the subsequent logic operations. The AND gate is utilized to combine and process various input signals, determining access to the vehicle. LED lights are incorporated to provide visual cues: a Red LED indicates automatic locking if the engine isn't initiated within a specific time frame after the start switch, while a Green LED signifies authorized access upon engine activation.

RESULT

Upon successful implementation and testing, the Smart Car security system demonstrated effective functionality in fortifying vehicle security through digital logic gates and essential components. The system's operation adhered to the predefined protocols, preventing unauthorized access while offering intuitive feedback mechanisms. The circuit accurately responded to simulated scenarios, triggering the appropriate visual cues and alarm signals in response to various user interactions.

When an unauthorized attempt was made to access the vehicle, the system promptly activated the alarm, effectively deterring the breach and signaling potential intrusions to nearby individuals. Additionally, the LED indicators performed as designed, displaying a Red LED light upon the start switch activation, indicating automatic system locking if the engine remained inactive within the specified time frame. Conversely, upon engine activation within the designated time, the Green LED indicator illuminated, providing access for authorized users to drive the car.

CONCLUSION

This hardware-based implementation of the Smart Car security system leverages logic gates, essential components, and a careful design approach to create a reliable security mechanism without the use of an Arduino, ensuring enhanced vehicle security with user-friendly visual feedback and alarm-triggering functionalities.