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1.1 Introduction

Remote keyless entry (RKE) is an electronic access system that can be controlled from a distance. RKEs, which are typically used to remotely lock or unlock doors, require the end user to initiate an action that will cause a physical or software key fob to transmit a radio signal to a receiver that controls an electronic lock. Typically, the action is to press a button on a physical fob or mobile app.

1.2 Abstract

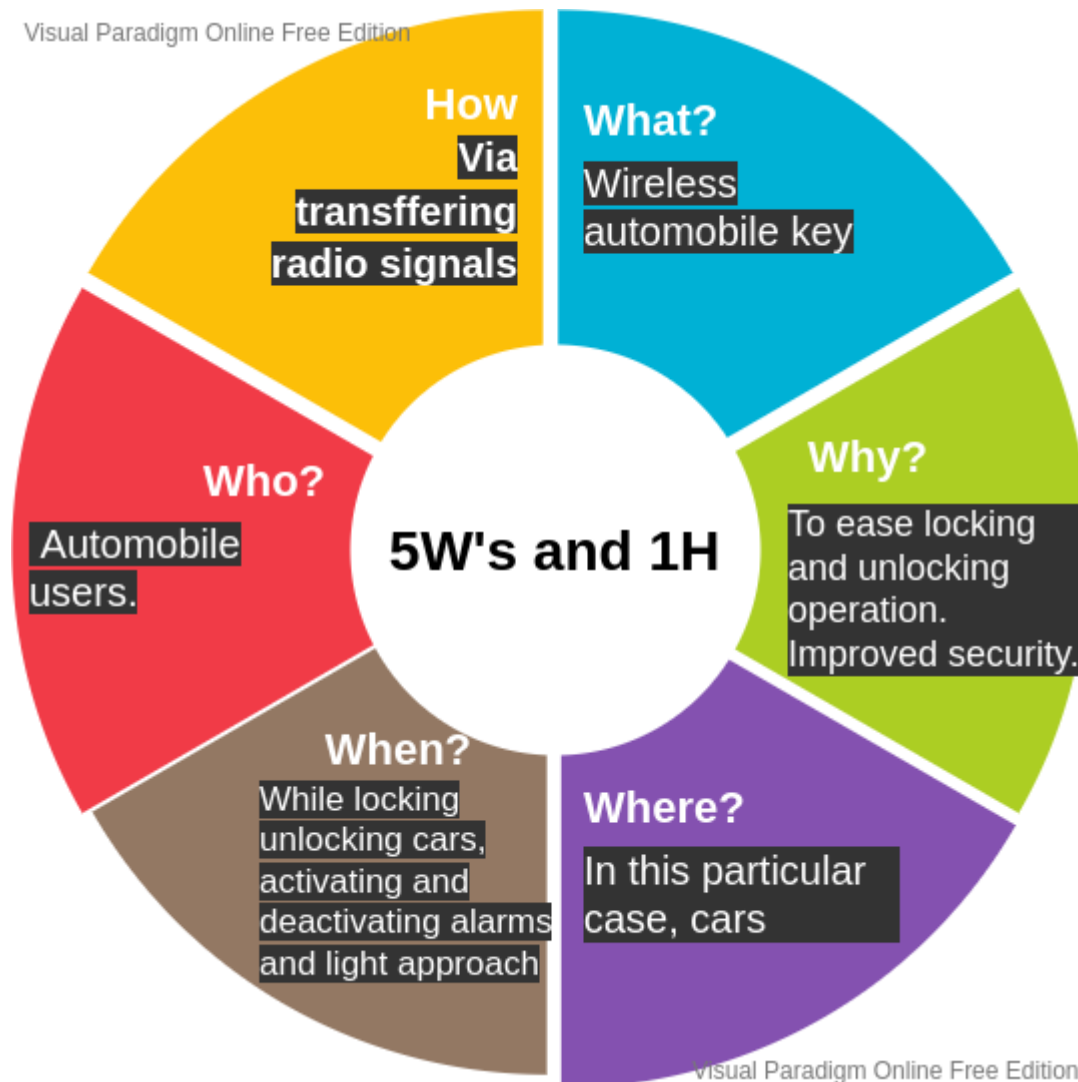
Remote Keyless Entry (RKE) systems are the successors to the traditional method of opening car doors by inserting physical keys. Keys with RKE-capabilities allow key-holders to remotely lock and unlock car doors, start or stop engines, or turn on and off anti-theft alarms.

1.3 Description

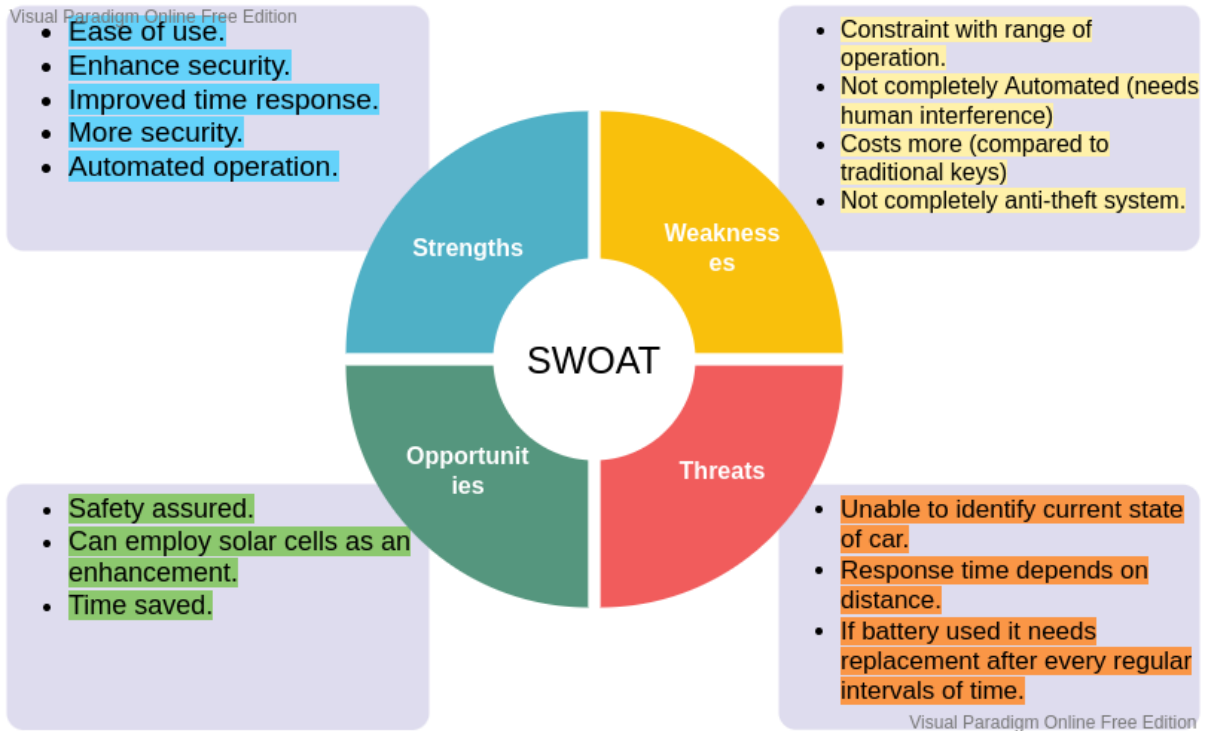
Remote keyless entry(R.K.E): This system aims to achieve the goal of Locking the car, Unlocking the car, Alarm activation/deactivation and Light Focus if anyone approaches it. There are particular led signalling for particular functionalities. Let's consider if we press a button 1 time all the LED will be turned on which means the car is locked,If one presses the button twice all LEDs will turn off indicating the car is unlocked, if one presses the button thrice it'll activate or deactivate the alarm system and if one presses the button four times it indicates a person's approach by focusing light and so on.

2. 5 W's and 1 H

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3. SWOAT ANALYZES



4. Requirements

4.1 High level requirements

Test ID	Description	Category
HLR_01	System shall be having a feature of locking	Technical
HLR_02	System shall be having a feature of unlocking	Technical
HLR_03	System shall be having a feature of alarm activation/deactivation	Technical
HLR_04	System shall be having a feature of approach light	Technical

4.2 Low level requirements

Test ID	Description	HLR ID	Category
LLR_01	Pressing a particular button shall switch on the all LED's at a same time	HLR_01	Functional
LLR_02	Pressing a button twice shall turn LED's on in clockwise manner	HLR_03	Functional
LLR_03	Pressing a particular button shall switch off the LED's at a same time	HLR_02	Functional
LLR_04	Pressing a button twice shall turn LED's on in Green -> Orange -> Red -> Blue fashion	HLR_03	Functional
LLR_05	Pressing a button four times shall turn LED's on in clockwise manner	HLR_04	Functional
LLR_06	Pressing a button twice shall turn LED's on in Green -> Orange -> Red -> Blue fashion	HLR_04	Functional

5 Test Plan and Output

1.1 HIGH LEVEL TEST PLAN

Test ID	Description	Input	Expected output	Actual Output
HLTP_01	Car Lock	User input button press onced	Car locked	Car locked
HLTP_02	Car Unlock	User input button presses twiced	Car unlocked	Car unlocked
HLTP_03	Alarm activation	User input button presses trice	Alarm activated	Alarm activated
HLTP_04	Alarm deactivation	User input button presses trice	Alarm deactivated	Alarm deactivated
HLTP_05	Approach Light	User input button presses four times	Approach light turned On	Approach light turned On

1.2 LOW LEVEL TEST PLAN

Test ID	Description	Input	Expected output	Actual Output	Status
LLTP_01	check for BTN_Pressed Enable	User Button Pressed once	All LEDs turned on	All LEDs turned on	✓
LLTP_02	Check for BTN_Pressed disable	User Button Pressed twice	All LEDs turned off	All LEDs turned off	✓
LLTP_03	Check for BTN_Pressed Enable	User Button Pressed thrice	LED is on with clockwise rotation	LED is on clockwise rotation	✓
LLTP_04	Check for BTN_Pressed disable	User Button Pressed thrice	LED is On with anticlockwise rotation	LED is on with anticlockwise rotation	✓

Test ID	Description	Input	Expected output	Actual Output	Status
LLTP_01	check for BTN_Pressed Enable	Button pressed once	Locked	Locked	✓
LLTP_02	Check for BTN_Pressed disable	Button pressed twice	Un-locked	Un-locked	✓

LLTP_0 3	check for BTN_Pressed Enable	Button pressed thrice	Alarm activated	Alarm activated	✓
LLTP_0 4	check for BTN_Pressed Enable	Button pressed thrice	Alarm deactivated	Alarm deactivated	✓
LLTP_0 5	Check for BTN_Pressed disable	Button pressed four times	Approach light turned on	Approach light turned on	✓

Conclusion and results:

We have successfully built a Remote keyless entry (RKE) system using the tool STM32Cube IDE, which enabled us to understand the concepts of embedded C and many more.