ARDUINO LOCKING SYSTEM

COMPONENTS

ARDUINO
UNO(R3)

RFID RC522

RED/GREEN
LED'S

BUZZER

KEYPAD 4X4

LCD(16X2)+I2C
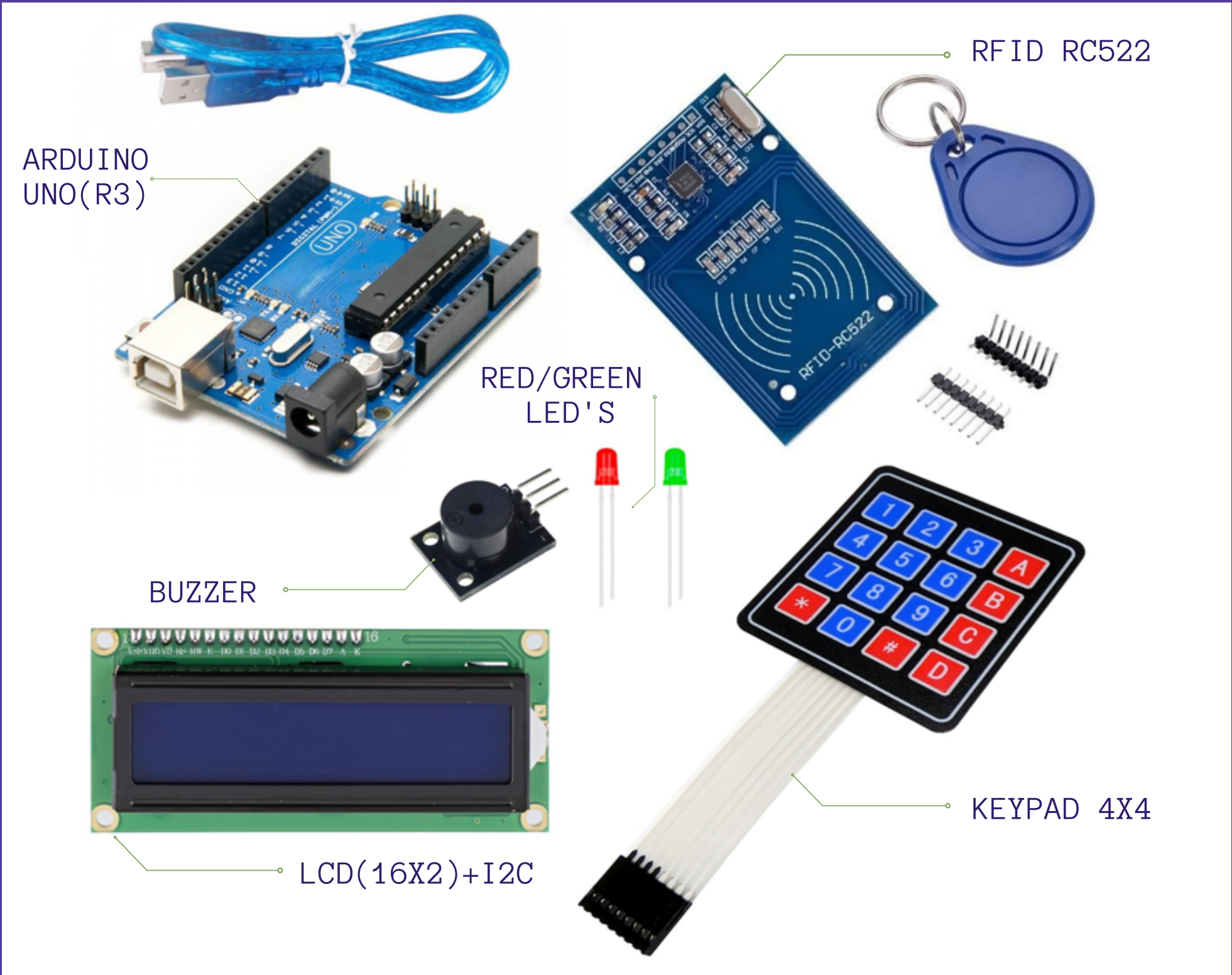
COMPONENT			COMPONENT		
	COL	2	BUZZER	S	A3
	COL	3		VCC	3.3 V
	COL	4		RST	A0
KEYPAD	COL	5		MISO	12
	ROW	6	RFID	MOSI	11
	ROW	7		SCK	13
	ROW	8		SDA	10
	ROW	9			
LCD	SCL	SCL	VCC		5 V
	SDA	SDA			
LED	RED	A2	GND		GND
	GREEN	A1			

HOW IT WORKS

PAGE NAVIGATION

USING THE KEYPAD YOU CAN NAVIGATE THE MENUS SHOWN ON THE LCD (HOME, ENTER PIN, SETTING ETC.) THAT GIVE ACCESS TO DIFFERENT FUNCTIONS.
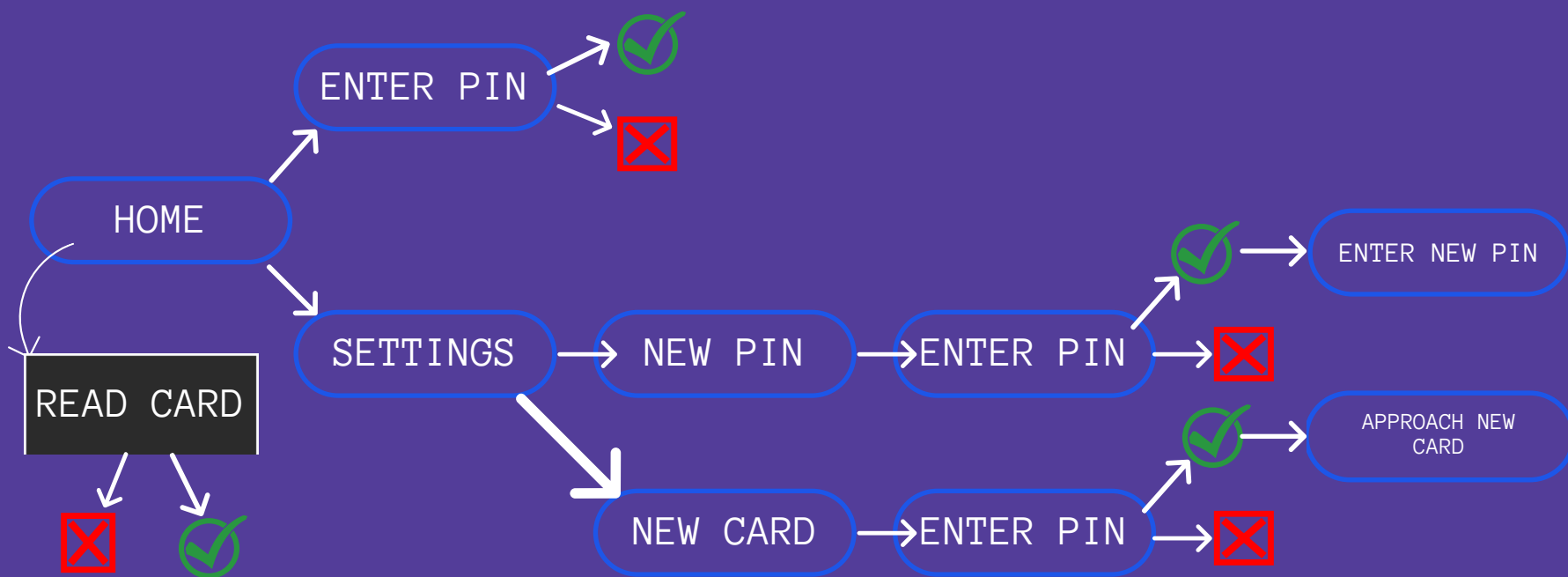
CARD/PIN DETECTION AND VALIDATION

AFTER READING THE ENCRYPTED CODE FROM A CARD OR A TAG IT IS COMPARED TO A CODE THAT IS STORED INTO THE SYSTEM'S MEMORY (EEPROM). THE CORRECT PIN IS ALSO STORED AND COMPARED WITH THE INPUT PIN.

CARD/PIN REPLACEMENT (SETTINGS)

NAVIGATING TROUGH SETTINGS YOU MAY NOTICE THE OPTIONS TO REPLACE BOTH PIN OR CARD. BEFORE REPLACING THE SYSTEM REQUIRES TO VERIFY THE CURRENTLY SAVED PIN.
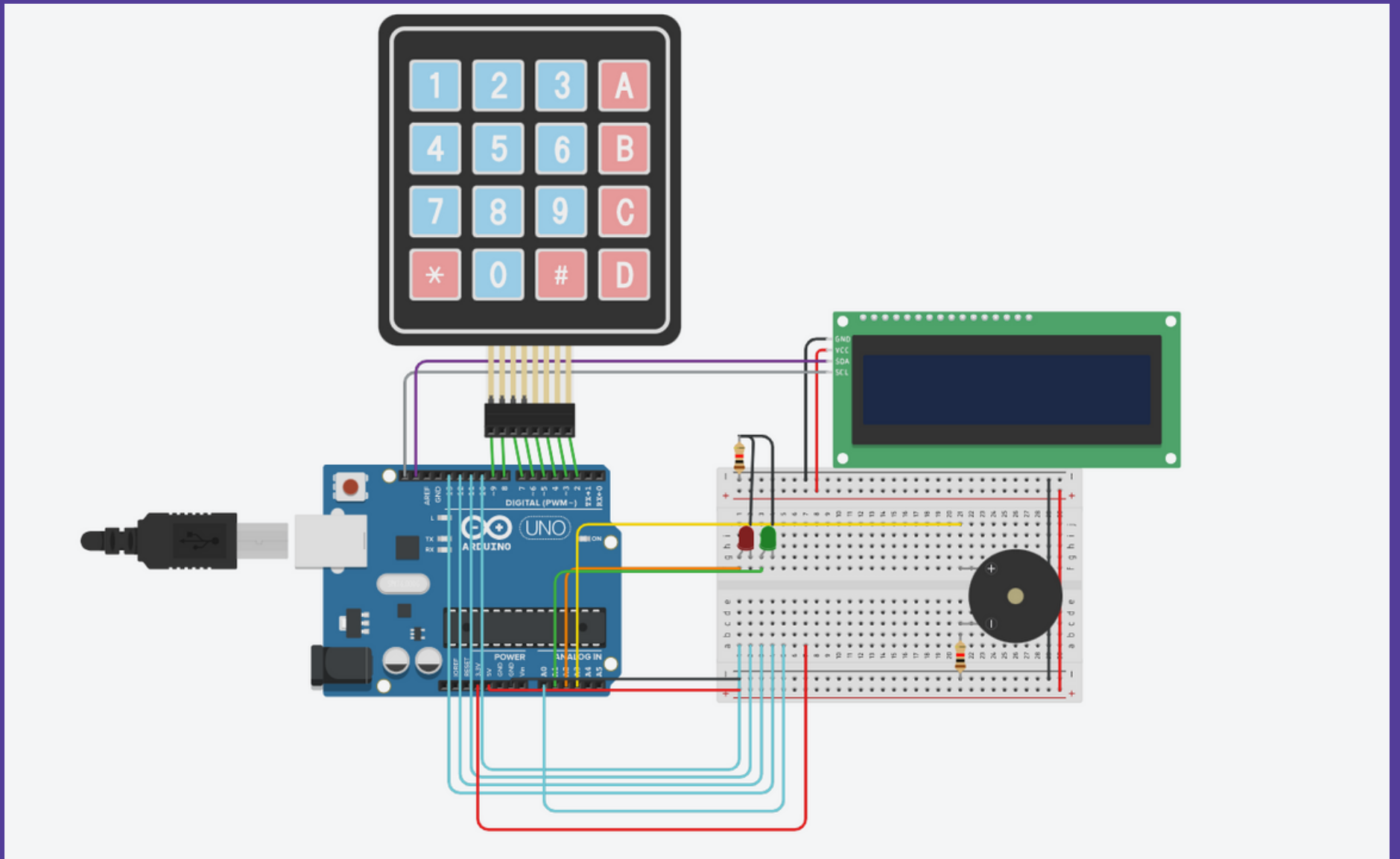
INPUT DETECTION FOR LCD

EVERY TIME THE KEYPAD IS USED A TIMER OF 20 SECONDS STARTS. AFTER 20 SECONDS WITH NO INPUT FROM THE USER THE BACKLIGHT OF THE LCD IS TURNED OFF AND THE NAVIGATOR GOES BACK TO THE HOME MENU.

LEDS AND BUZZER

THE LEDS AND THE BUZZER INDICATES IF THE CARD OR THE PIN ARE CORRECT OR INCORRECT.

ELECTRONICS

NOTES:

- RFID RC522 IS MISSING BECAUSE THINKERCAD DOESN'T HAVE IT ON IT'S LIBRARY. THE PINS THAT ARE SUPPOSED TO BE CONNECTED TO THE MODULE ARE JUST CONNECTED TO THE BREADBOARD. THE MODULE'S VCC SHULD BE CONNECTED TO 3.3V.

- THE LEDS ARE CONNECTED TO A COMMON RESISTOR BECAUSE THE CODE DOESN'T ALLOW BOTH OF THEM TO BE TURNED ON AT THE SAME TIME. IF THERE ARE INSTANCES WHERE THIS IN NOT THE CASE, USING A SECOND RESISTOR IS REQUIRED.

CASE DESIGN

USES AND POSSIBLE UPGRADES

CURRENTLY THE OUTPUTS THAT APPLY THE FUNCTIONS ARE THE LEDS AND THE BUZZER. THE SYSTEM CAN BE CONNECTED TO A LOCK USING SERVO MOTORS OR TO AN ALLARM.

THE SYSTEM CAN READ NFC TAGS WHICH CAN BE PLACED ON DIFFERENT DAILY USE OBJECTS (WATCH, PHONE, BRACELET, WALLET, ETC.).

THE CODE CAN BE MODIFIED TO STORE MULTIPLE CARD CODES AND/OR PINS.