

Sistema Embedded per la gestione della serratura di un automobile con lettore NFC

Arduino MEGA 2560

Davide Ferrari, Matteo Ferrari, Mattia Trabucco

Keyless

Immagine dimostrativa

Sensore di prossimità
interno della maniglia

Sensore di prossimità
esterno della maniglia



Antenna all'esterno
dell'abitacolo

Piedinatura

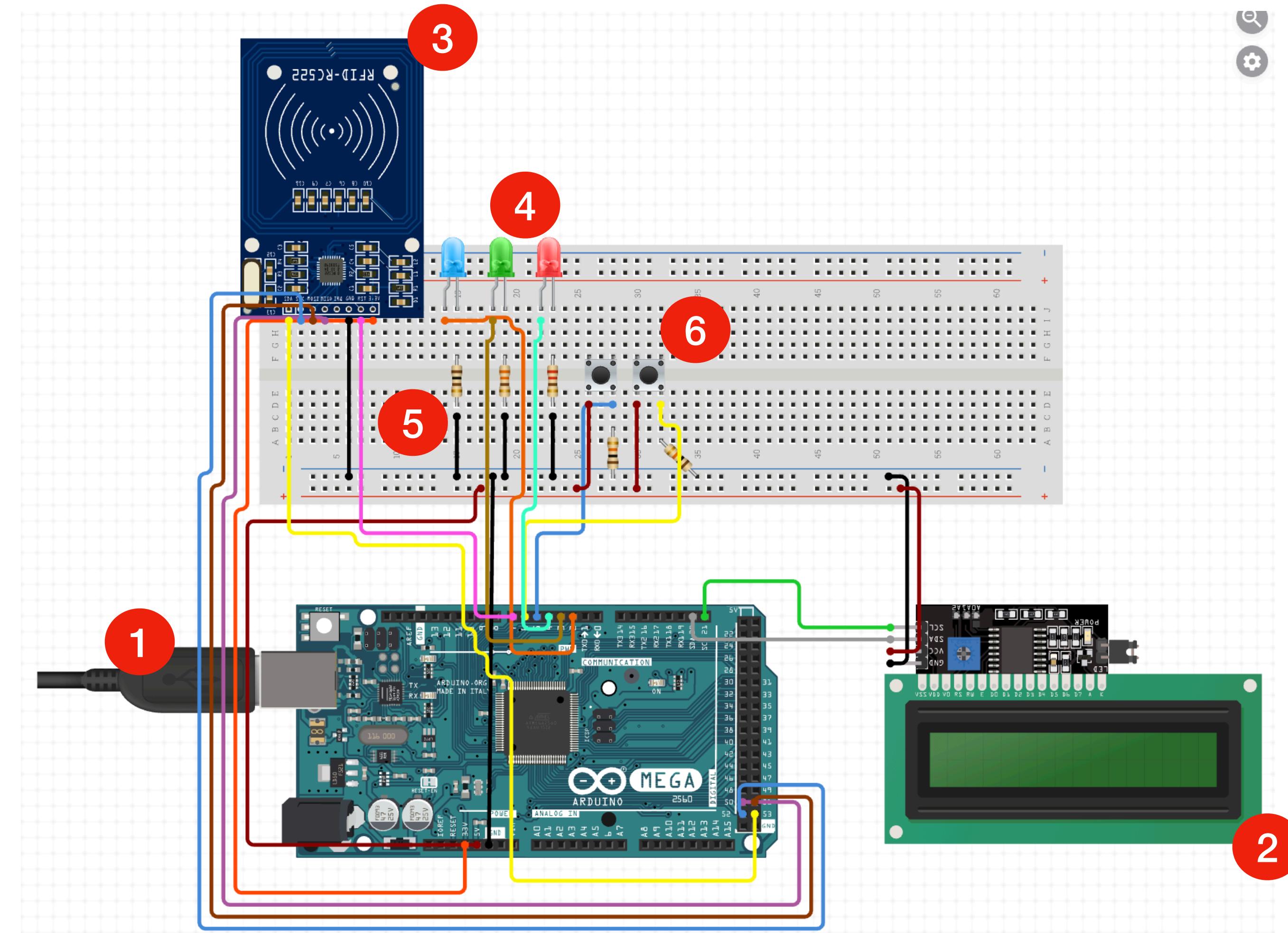
Schema breadboard

Componenti

1. Elegoo MEGA 2560
2. Display LCD
3. RFID RC522
4. 3 LED

 - blu -> prossimità
 - verde -> aperto
 - rosso -> chiuso

5. 5 resistenze
6. 2 buttoni



Task Design

Priorità

2

TaskReadRFID

Stack size: 128
Prio: 2

1

TaskDisplay

Stack size: 128
Prio: 1

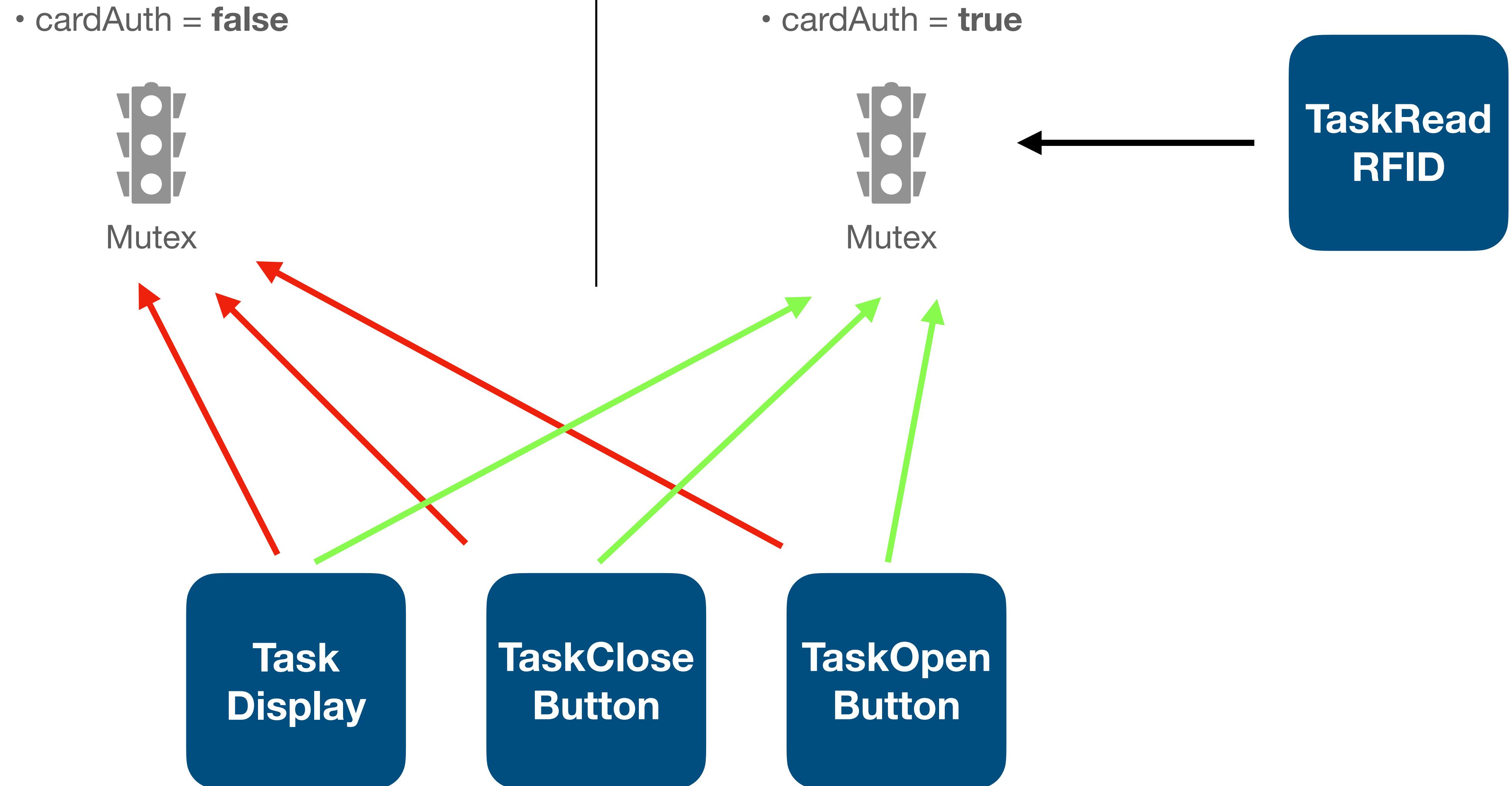
TaskOpenButton

Stack size: 128
Prio: 1

TaskCloseButton

Stack size: 128
Prio: 1

Task Synchronization

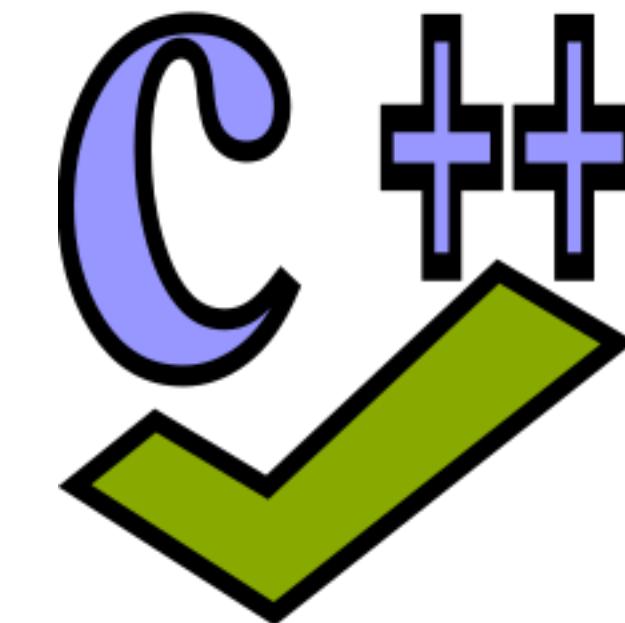


MISRA-C

- Cppcheck: strumento di analisi del codice statico per i linguaggi di programmazione C e C ++
- Esempio di violazione della regola 14.4

```
4  RFID_task/RFID_task.ino ...
...
@@ -117,9 +117,9 @@ void TaskReadRFID(void *pvParameters)
117 117 {
118 118     if (xSemaphoreTake(mutex, 10) == pdTRUE) //We need to check for mutual exclusion
119 119     {
120 -     if (mfrc522.PICC_IsNewCardPresent()) //Vendor-specific function that tells if there's a card within the range
120 +     if (mfrc522.PICC_IsNewCardPresent() == true) //Vendor-specific function that tells if there's a card within the range
121 121     {
122 -     if (mfrc522.PICC_ReadCardSerial()) //Vendor-specific function that tells if the reading part was successful
122 +     if (mfrc522.PICC_ReadCardSerial() == true) //Vendor-specific function that tells if the reading part was successful
123 123     {
124 124         Serial.print("Tag UID: ");
125 125         for (byte i = 0; i < mfrc522.uid.size; i++)
...

```



14.4: The controlling expression of an if statement and the controlling expression of an iteration- statement shall have essentially Boolean type

- Esempio di violazione regola 12.1

```
141   141
142   -      if (cardCount % 2 == 1)
142   +      if ((cardCount % 2) == 1)
143   143      {
```

- The precedence of operators within expressions should be made explicit

