



PROJECT TO EXTRACT DATA FROM RFID TO MySQL USING Python AND ARDUINO

Content:

- **Introduction to IoT**
- **About RFID and Arduino UNO**
- **Implementation**
- **Code**
- **Project**
- **Summery**

PROJECT BY:

Kundan Pawar

SUBMITTED TO:

MS. Karuna (Nielit KUK)

Signature: _____



National Institute of Electronics and Information Technology

Ministry of Electronics and Information Technology, Government of India

O LEVEL ONLINE EXAMINATION FORM - JULY, 2022

Application Number	Application Date & Time	For Office Use Only	
EOIT0722006391	19-Jun-2022 11:49:32 AM	Demand Note No.	7995764
		Demand Note Date	19-Jun-2022
		Batch No.	



1. Applicant's Personal Details / आवेदक का व्यक्तिगत विवरण

Applicant's Full Name / आवेदक का पूरा नाम	Mr. Kundan Pawar
Father's/Guardian's Name / पिता/अभिभावक का नाम	Mr. Rajbir Pawar
Mother's Name / माता का नाम	Mrs. Amarjeet Kaur
Date of Birth / जन्म दिनांक (dd/mm/yyyy)	29-Aug-1997

2. Registration Details / पंजीयन का विवरण

Registration No. / पंजीकरण संख्या	1412367
Course Name / कोर्स का नाम	O LEVEL
Candidate Type / उम्मीदवार का प्रकार	Direct Candidate

3. Contact Details / संपर्क विवरण

Phone with STD code / दूरभाष एस टी डी कोड सहित	
Mobile Number / मोबाइल नंबर	9992516678
Email Address / ईमेल पता	luckypawar1997@gmail.com

4. Correspondence Address / पत्राचार का पता

Address / पता	HNO 176 VPO KAIMLA, TEHSIL GHARAUNDA Karnal District:- Karnal, State:- Haryana, Pin:- 132114
---------------	---

5. Exam Details / परीक्षा का विवरण

Exam Name / परीक्षा का नाम	July, 2022
Exam Centre First Choice / परीक्षा केंद्र पहला विकल्प	HRKUR (Kurkshetra)
Exam Centre Second Choice / परीक्षा केंद्र दूसरा विकल्प	CHCHA (Chandigarh)
Improvement/इम्प्रूवमेंट	No
Modules Appearing / मौजूद होने वाले	01. M1-R5 Information Technology Tools and Network Basics 02. M2-R5 Web Designing & Publishing
Practicals Appearing / प्रैक्टिकल देने	01. PR1 PRACTICAL1 02. PR2 PRACTICAL2

6. Fee Details / शुल्क विवरण

No. of Modules X Fee/Module / मौजूद होने वाले X शुल्क/मौजूद होने वाले	(0 x 750.00 + 2 x 1000.00)	2000.00
No. of Practicals X Fee/Practical / प्रैक्टिकल होने वाले X शुल्क/प्रैक्टिकल	(0 x 500.00)	0.00
Exam Form Processing Fees / परीक्षा फार्म का प्रसंस्करण शुल्क		100.00
Late Fees(if applicable) / विलंब शुल्क (यदि लागू हो)		0.00 (Not Applicable)
Total Fees / कुल शुल्क	Two Thousand One Hundred Rupees Only	2100.00

8. Payment Detail

Applying This Exam	As Direct Candidate
Application Examination Fee will be Deposited by	Candidate
Payment Mode:	ONLINE
Transaction no. of payment receipt प्राप्त ट्रांज़ेक्शन संख्या दर्ज करें	WSM21224677477 Transaction Date 20-Jun-2022 06:48

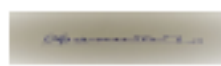
Note *: Please don't send this form without making payment./कृपया इस फार्म को भुगतान के बिना नहीं भेजें

Note *: Please pay examination fee through available payment options and after making payment submit this form for Institute verification to the Institute mentioned above in the form. /कृपया भुगतान के लिए उपलब्ध विकल्पों में से किसी एक का ध्यान करके परीक्षा शुल्क का भुगतान कर ऊपर वर्णित संस्थान को साधन के लिए परीक्षा फार्म प्रस्तुत करें।

Note *: Last date of payment of examination fee / परीक्षा शुल्क का भुगतान की अंतिम तारीख: 05-Jul-2022

7. Declaration / घोषणा

I, Kundan Pawar S/o Rajbir Pawar registered as a Direct Candidate hereby declare that, all the particular stated in the application, are true to the best of my knowledge and belief. I hereby certify that I have applied the aforesaid checks before submitting the Online Examination Form. I have read and understood all the instructions available on the site. I agree to abide by the rules and regulations of the NIELIT and also to the decision of the Examination Authority, on any issue related to my admission to the Examination. I have noted that the Examination Authority has the right to withhold my result ever after appearing in the Examination in addition to any other action as may be deemed fit in the event of any of the statements made above being found incorrect or my candidature being found ineligible at a later date. I have specially gone through the eligibility criteria laid down by NIELIT for appearing in different examinations and I confirm that I fulfill the eligibility for the Theory & Practical modules, I have applied for.



Left hand thumb impression / बाएं हाथ के अंगूठे का निशान

Signature of Applicant/ हस्ताक्षर

Introduction:

The Internet of Things (IoT) describes the network of physical objects—“things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. These devices range from ordinary household objects to sophisticated industrial tools. With more than 7 billion connected IoT devices today, experts are expecting this number to grow to 10 billion by 2020 and 22 billion by 2025. Oracle has a network of device partners.

Why is Internet of Things (IoT) so important?

Over the past few years, IoT has become one of the most important technologies of the 21st century. Now that we can connect everyday objects—kitchen appliances, cars, thermostats, baby monitors—to the internet via embedded devices, seamless communication is possible between people, processes, and things.

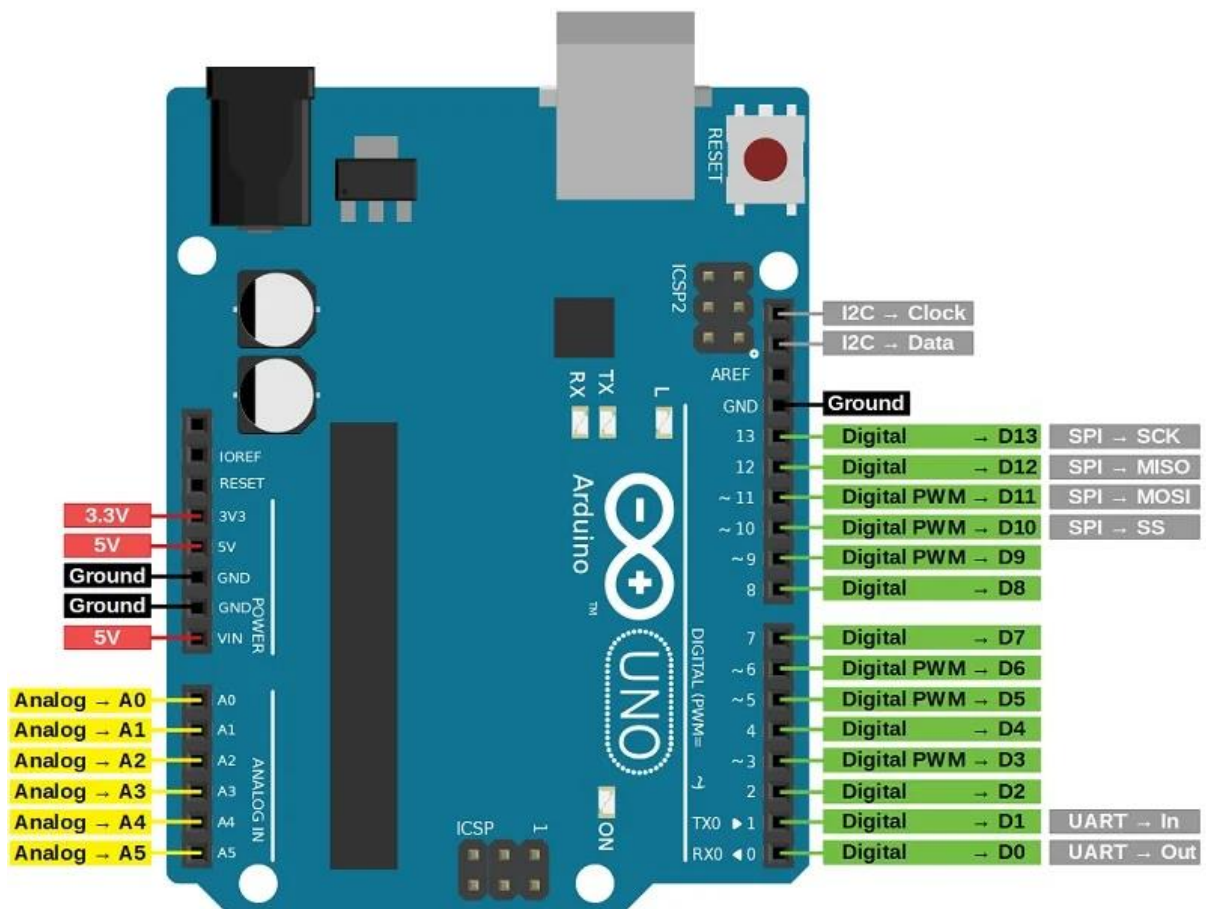
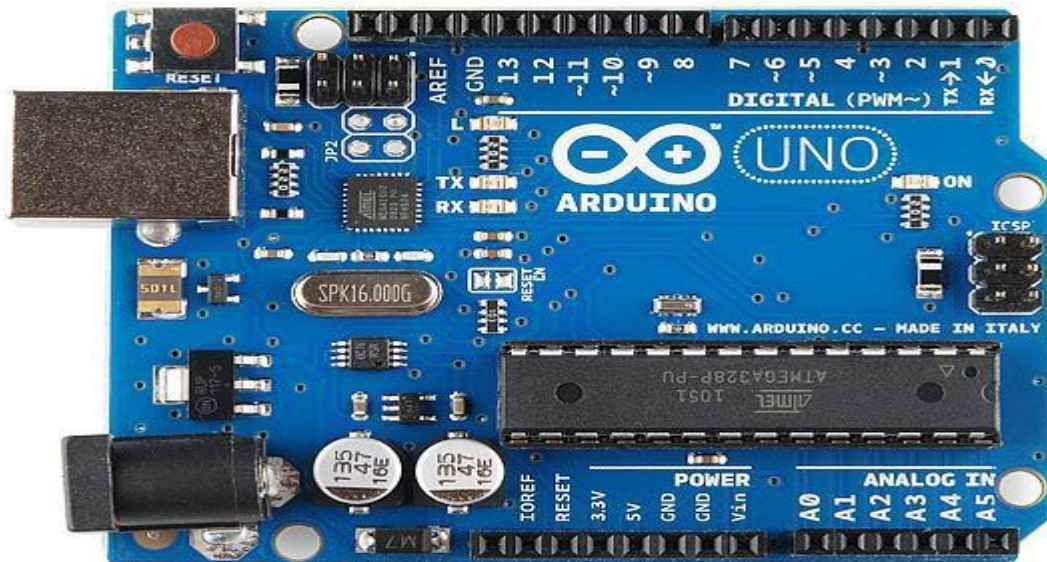
By means of low-cost computing, the cloud, big data, analytics, and mobile technologies, physical things can share and collect data with minimal human intervention. In this hyperconnected world, digital systems can record, monitor, and adjust each interaction between connected things. The physical world meets the digital world—and they cooperate.

What technologies have made IoT possible?

While the idea of IoT has been in existence for a long time, a collection of recent advances in a number of different technologies has made it practical.

- Access to low-cost, low-power sensor technology. Affordable and reliable sensors are making IoT technology possible for more manufacturers.
- Connectivity. A host of network protocols for the internet has made it easy to connect sensors to the cloud and to other “things” for efficient data transfer.
- Cloud computing platforms. The increase in the availability of cloud platforms enables both businesses and consumers to access the infrastructure they need to scale up without actually having to manage it all.
- Machine learning and analytics. With advances in machine learning and analytics, along with access to varied and vast amounts of data stored in the cloud, businesses can gather insights faster and more easily. The emergence of these allied technologies continues to push the boundaries of IoT and the data produced by IoT also feeds these technologies.
- Conversational artificial intelligence (AI). Advances in neural networks have brought natural-language processing (NLP) to IoT devices (such as digital personal assistants Alexa, Cortana, and Siri) and made them appealing, affordable, and viable for home use.

[Arduino](#) Arduino Is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs -< light on a sensor, a finger on a button, or a Twitter message > - and turn it into an output -< activating a motor, turning on an LED, Publishing something online>. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (Embedded C), and the Arduino Software (IDE), for providing Instructions.



Vin: This is the input voltage pin of the Arduino board used to provide input supply from an external power source.

5V: This pin of the Arduino board is used as a regulated power supply voltage and it is used to give supply to the board as well as on-board components.

3.3V: This pin of the board is used to provide a supply of 3.3V which is generated from a voltage regulator on the board

GND: This pin of the board is used to ground the Arduino board.

Reset: This pin of the board is used to reset the microcontroller.

Analog Pins: The pins A0 to A5 are used as an analog input and it is in the range of 0-5V.

Digital Pins: The pins 0 to 13 are used as a digital input or output for the Arduino board.

Serial Pins: These pins are also known as a UART pin. It is used for communication between the Arduino board and a computer or other devices. The transmitter pin number 1 and receiver pin number 0 is used to transmit and receive the data resp.

External Interrupt Pins: This pin of the Arduino board is used to produce the External interrupt and it is done by pin numbers 2 and 3.

PWM Pins: This pins of the board is used to convert the digital signal into an analog by varying the width of the Pulse. The pin numbers 3,5,6,9,10 and 11 are used as a PWM pin.

SPI Pins: This is the Serial Peripheral Interface pin, it is used to maintain SPI communication with the help of the SPI library. SPI pins include:

SS: Pin number 10 is used as a Slave Select

MOSI: Pin number 11 is used as a Master Out Slave In

MISO: Pin number 12 is used as a Master In Slave Out

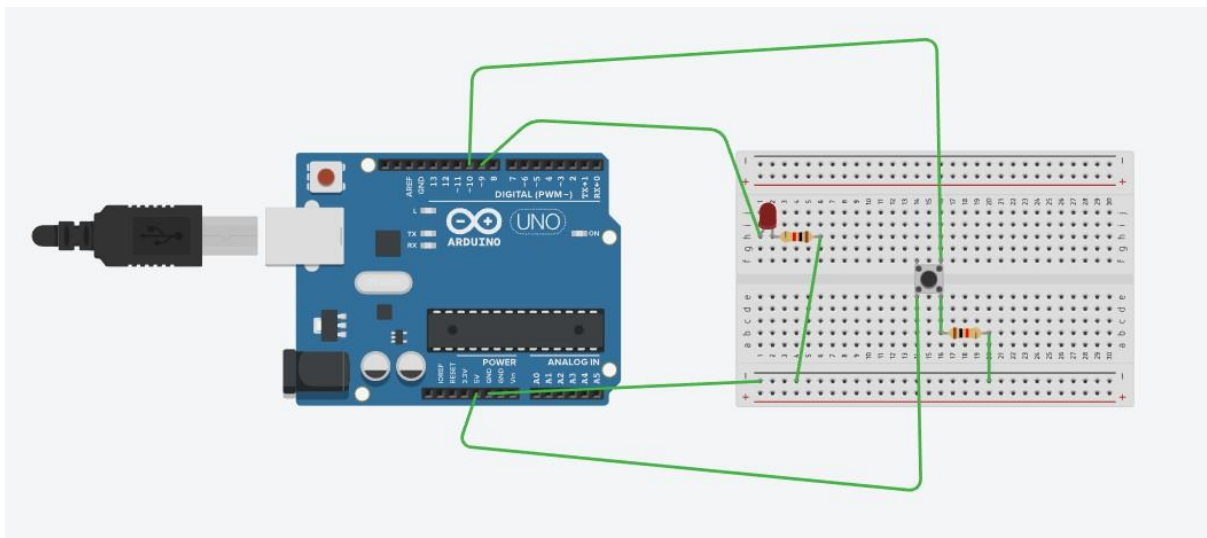
SCK: Pin number 13 is used as a Serial Clock

LED Pin: The board has an inbuilt LED using digital pin-13. The LED glows only when the digital pin becomes high.

AREF Pin: This is an analog reference pin of the Arduino board. It is used to provide a reference voltage from an external power supply.

Basic Program for Understanding Building :

LED ON/OFF USING SWITCH



//Kundan Pawar

CODE

```
void setup()
{
  pinMode(9, OUTPUT);
}
```

```

pinMode(10, INPUT);

}

void loop()
{
if(digitalRead(10)== HIGH)
{
digitalWrite(9, HIGH);
}
{
(digitalWrite(9,LOW));
}
}

```

<https://robu.in/arduino-pin-configuration/>

RFID Technology

Pins SPI Due

1 SDA (SS) --→ 10

2 SCK SCK1

3 MOSI MOSI1

4 MISO MISO1

5 IRQ *

6 GND GND

7 RST Reset --→ 9

Arduino UNO	RFID-RC522
• Pin 10	• SDA
• Pin 13	• SCK
• Pin 11	• MOSI
• Pin 12	• MISO
• NC	• IRQ
• GND	• GND
• Pin 9	• RST
• 3.3V	• 3.3V

Pin Number	Pin Name	Description
1	Vcc	Used to Power the module, typically 3.3V is used
2	RST	Reset pin – used to reset or power down the module
3	Ground	Connected to Ground of system
4	IRQ	Interrupt pin – used to wake up the module when a device comes into range
5	MISO/SCL/Tx	MISO pin when used for SPI communication, acts as SCL for I2c and Tx for UART.
6	MOSI	Master out slave in pin for SPI communication
7	SCK	Serial Clock pin – used to provide clock source
8	SS/SDA/Rx	Acts as Serial input (SS) for SPI communication, SDA for IIC and Rx during UART SS: Slave Selector,

+3.3V 3.3V

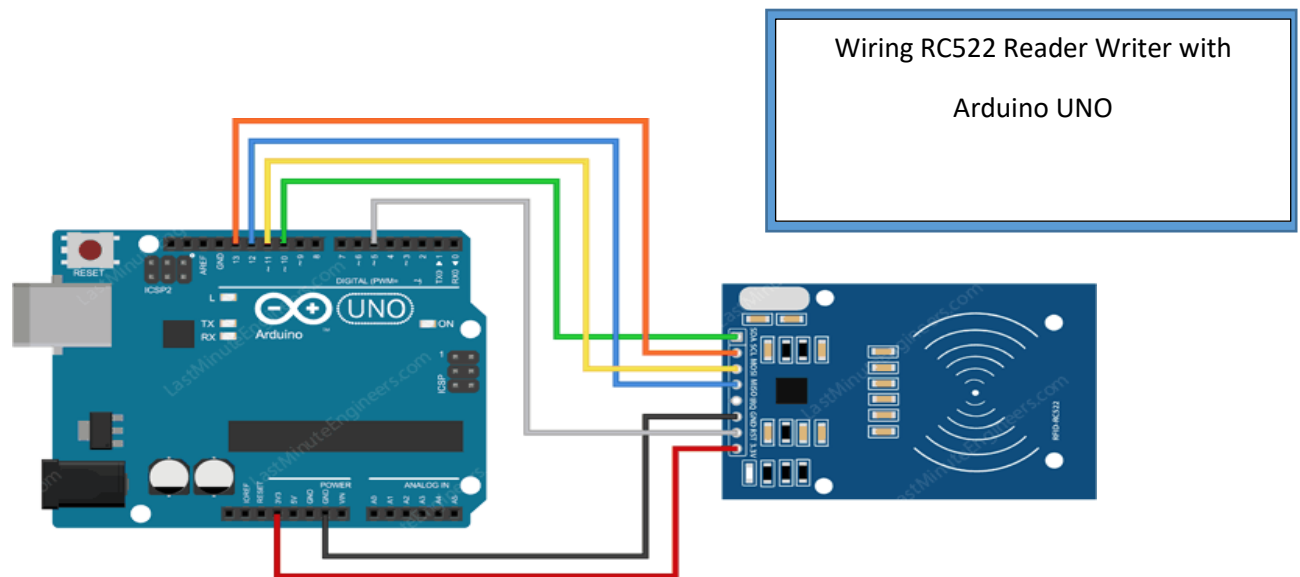
<https://lastminuteengineers.com/how-rfid-works-rc522-arduino-tutorial/>

C522 Pin Configuration

RC522 Features

- 13.56MHz RFID module
- Operating voltage: 2.5V to 3.3V
- Communication : SPI, I2C protocol, UART
- Maximum Data Rate: 10Mbps
- Read Range: 5cm
- Current Consumption: 13-26mA
- Power down mode consumption: 10uA (min)

Other RFID Modules

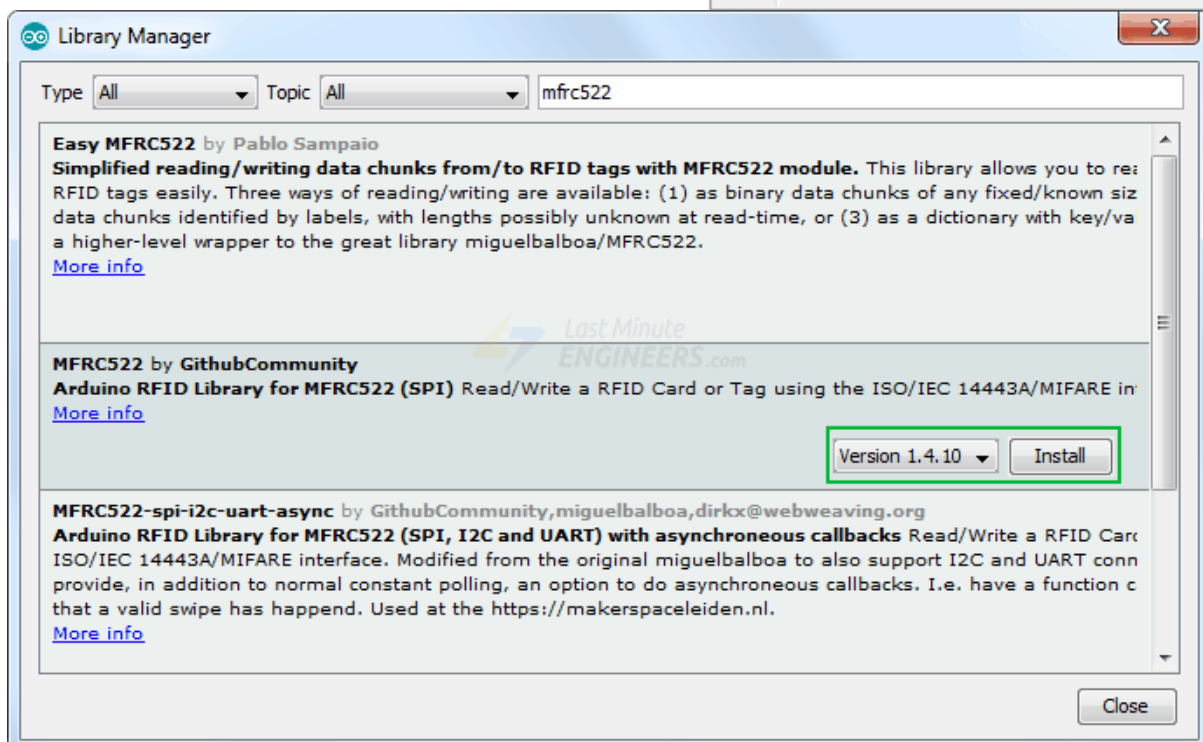
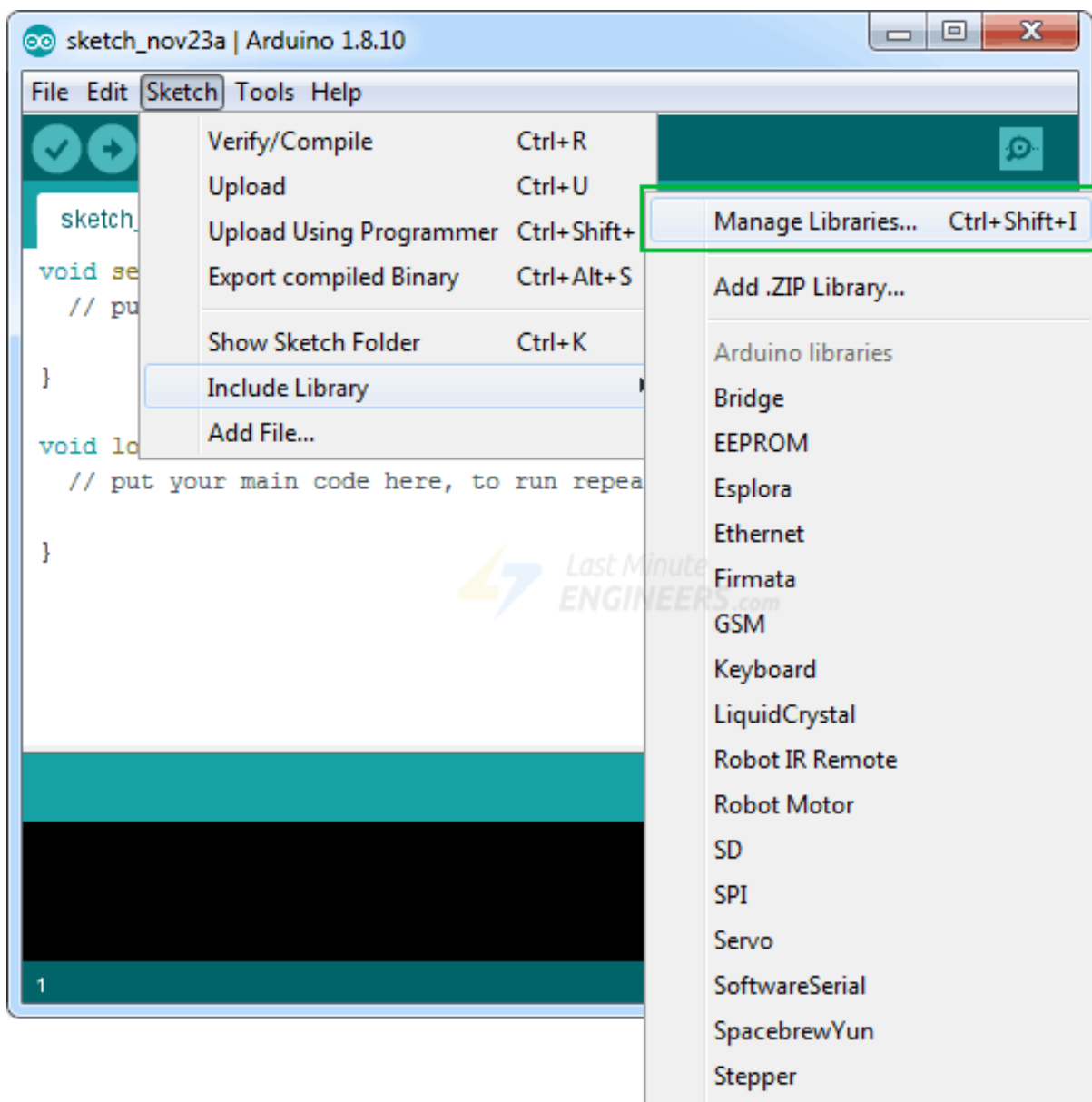


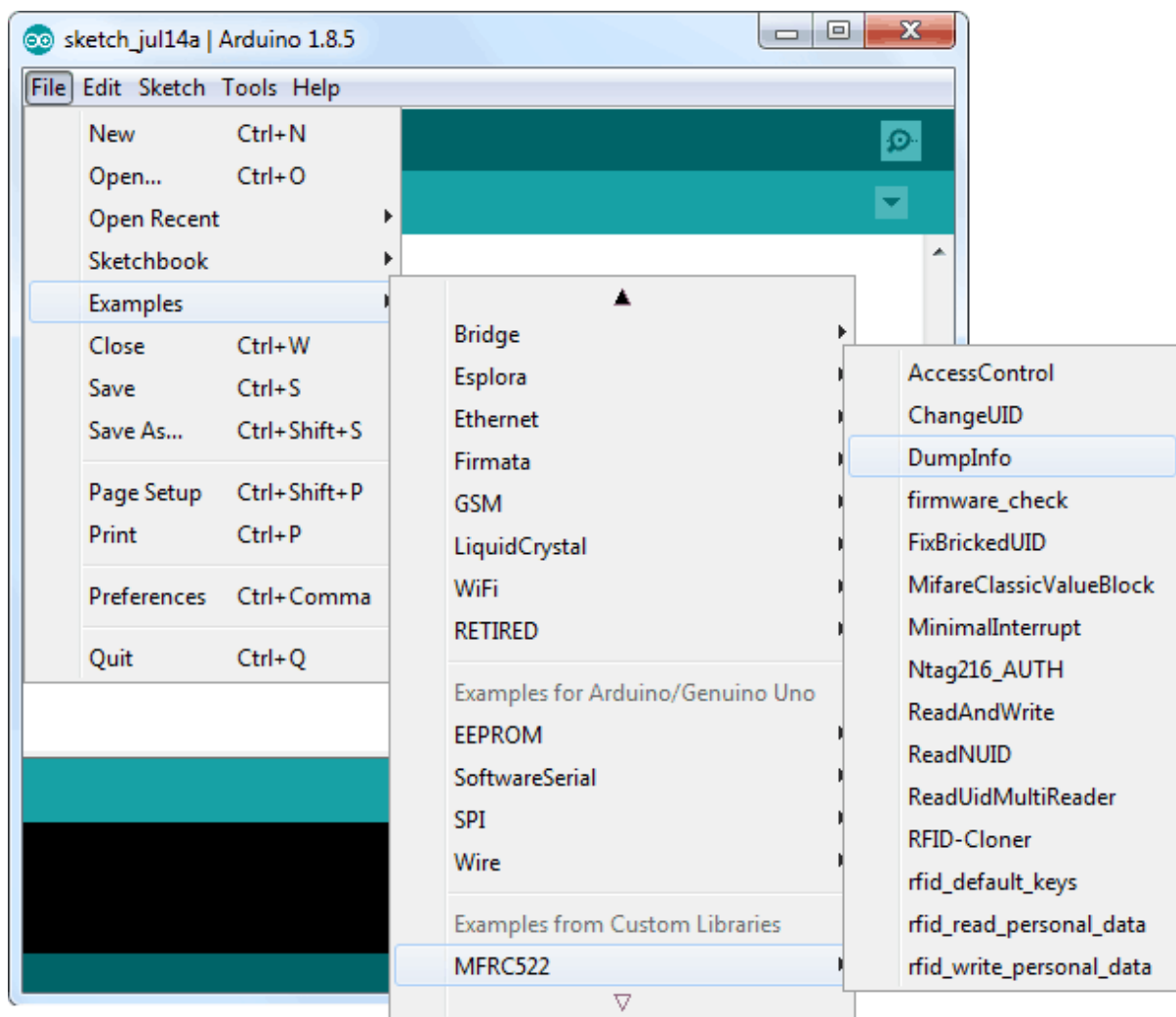
Library Installation

Communicating with an RC522 RFID module is a lot of work, but luckily for us there is a library called the MFRC522 Library that makes reading and writing RFID tags simple.

This library is not included in the Arduino IDE, so you will need to install it first.

To install the library navigate to Sketch > Include Libraries > Manage Libraries... Wait for Library Manager to download the library index and update the list of installed libraries.





<https://lastminuteengineers.com/how-rfid-works-rc522-arduino-tutorial/>

SQL CONNECTION WITH PYTHON USING MYSQLDB PACKAGE

```
import serial

import MySQLdb

import time

dbConn = MySQLdb.connect("localhost","root","","rfid_read") or die ("could not connect to database")

#open a cursor to the database

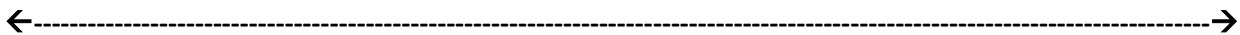
cursor = dbConn.cursor()

device = 'COM6' # this will have to be changed to the serial port you are using
```

```

try:
    print "Trying...",device
    arduino = serial.Serial(device, 9600)
except:
    print "Failed to connect on",device
while True:
    time.sleep(1)
    try:
        data=arduino.readline()
        print data
        pieces=data.split(" ")
        try:
            cursor=dbConn.cursor()
            cursor.execute("""INSERT INTO <your table name> (ID,Member_ID,allowed_members) VALUES
            (NULL,%s,%s)""", (pieces[0],pieces[1]))
            dbConn.commit()
            cursor.close()
        except MySQLdb.IntegrityError:
            print "failed to insert data"
        finally:
            cursor.close()
    except:
        print "Processing"

```



Code for Arduino UNO Application< Embedded C >

```

#include <SPI.h>
#include<MFRC522.h>
#include <Ethernet.h>
#define SS_PIN 10
#define RST_PIN 9

```

```
#define No_Of_Card 3
```

```
MFRC522 rfid(SS_PIN,RST_PIN);
```

```
MFRC522::MIFARE_Key key;
```

```
byte id[No_Of_Card][4]={
```

```
    {142,76,58,42},      //RFID NO-1
```

```
    {112,224,72,84},     //RFID NO-2
```

```
    {151,94,80,84}       //RFID NO-3
```

```
};
```

```
byte id_temp[3][3];
```

```
byte i;
```

```
int j=0;
```

```
void setup() {
```

```
    Serial.begin(9600);
```

```
    SPI.begin();
```

```
    rfid.PCD_Init();
```

```
    for(byte i=0;i<6;i++)
```

```
    {
```

```
        key.keyByte[i]=0xFF;
```

```
    }
```

```
}
```

```
//-----
```

```
/* Infinite Loop */
```

```
void loop()
```

```
{int m=0;
```

```
    if(!rfid.PICC_IsNewCardPresent())
```

```
        return;
```

```

if(!rfid.PICC_ReadCardSerial())

return;

for(i=0;i<4;i++)

{

    id_temp[0][i]=rfid.uid.uidByte[i];

        delay(50);

}

for(i=0;i<No_Of_Card;i++)

{

    if(id[i][0]==id_temp[0][0])

    {

        if(id[i][1]==id_temp[0][1])

        {

            if(id[i][2]==id_temp[0][2])

            {

                if(id[i][3]==id_temp[0][3])

                {

                    Serial.println("Card detected:");

                    for(int s=0;s<4;s++)

                    {

                        Serial.print(rfid.uid.uidByte[s]);

                    }

                    Serial.print(" ");

                    Sending_To_db();

                    j=0;

                    rfid.PICC_HaltA(); rfid.PCD_StopCrypto1(); return;

                }

            }

        }

    }

}

else

```

```

{j++;
if(j==No_Of_Card)
{
    Serial.println("Card detected:");
    for(int s=0;s<4;s++)
    {
        Serial.print(rfid.uid.uidByte[s]);
    }
    Serial.print(" ");
    Sending_To_db();
    j=0;
}
}
}

// Halt PICC
rfid.PICC_HaltA();

// Stop encryption on PCD
rfid.PCD_StopCrypto1();
}

```

```

void Sending_To_db()

```

```

{
    if(j!=No_Of_Card)
    {
        Serial.print('1');
        Serial.print(" ");
    }
    else
    {
        Serial.print('0');
        Serial.print(" ");
    }
}

```


}

}

@pyserial v-3.4

@PLX-DAQ V-Excel

