RFID LIBRARY MANAGEMENT SYSTEM

IOT

Muaz Ata Ur Rehman
muazthemaster@gmail.com

RFID Library Management System

Pre-Requisite:

- Before doing this project I prefer you to first do RFID attendance based system because using that same this Smart basket system can be made by making some small alteration in it.

Description:

- In this project we will be using RFID CAT 1 type cards to mark user and book.
- Then if the user have been scanned then the book will be "ISSUED" otherwise it would ask to "SCAN THE USER FIRST" after issuing the book if the book card is scanned again then the book status will change to return.
- We don't need a big database for now otherwise we can create a database in MYSQL or ORACLE.
- For real time use use a CAT 4 tag

Software:

- Arduino IDE

Components Required:

- RFID CAT1 card (1 or 2)
- RFID- RC522 (RFID card reader)
- Arduino UNO

Wiring Schematics:

Arduino UNO	RFID-RC522
Pin10	SDA
Pin13	SCK
Pin11	MOSI
Pin12	MISO
---	IRQ
GND	GND
Pin9	RST
3.3V	3.3V

CODE:

```
#include <SPI.h>
#include <MFRC522.h>

#define SS_PIN 10 //RX slave select
#define RST_PIN 9

MFRC522 mfrc522(SS_PIN, RST_PIN); // Create MFRC522 instance.

byte card_ID[4]; //card UID size 4byte
byte IssuedBy[4]={0x3D,0x87,0x25,0xD9};//first UID card
byte Book1[4]={0xA2,0x3C,0xEE,0x29};//second UID card
byte Book[4]={0x43,0x96,0xEF,0x29};//second UID card

int NumbCard[3];//the number of cards. in my case i have just two cards.
int card=0;
bool appear=0;
int statu[3];//the number of cards. in my case i have just two cards.
int s=0;
int count=0;
int i=0;// user number

int const RedLed=6;
int const GreenLed=5;
int const Buzzer=8;

String Log;
String Name;//user name
int Price;//user number
```

```
int n ;//The number of card you want to detect (optional)


void setup() {


  Serial.begin(9600); // Initialize serial communications with the PC

  SPI.begin();  // Init SPI bus

  mfrc522.PCD_Init(); // Init MFRC522 card


  Serial.println("Library Systm");                // clears starting at row 1


  pinMode(RedLed,OUTPUT);

  pinMode(GreenLed,OUTPUT);

  pinMode(Buzzer,OUTPUT);


  delay(200);

   }


void loop() {


  //look for new card

   if ( ! mfrc522.PICC_IsNewCardPresent()) {

  return;//got to start of loop if there is no card present

 }

 // Select one of the cards

 if ( ! mfrc522.PICC_ReadCardSerial()) {

  return;//if read card serial(0) returns 1, the uid struct contians the ID of the read card.

 }


 for (byte i = 0; i < mfrc522.uid.size; i++) {

    card_ID[i]=mfrc522.uid.uidByte[i];
```

```
 if(card_ID[i]==IssuedBy[i]){
 Name="Muaz Ata Ur Rehman";//Issuer Name
 card=0;
 i=0; // User number
 s=0; //status

}
else if(card_ID[i]==Book[i]){
 Name="Rasberry Pie in 24h";//Book Name

 card=1;



 s=0; // status



}
else if(card_ID[i]==Book1[i]){
 Name="Gone with the Wind";//Book Name

 card=2;
 s=0; // status



}
else{
   digitalWrite(GreenLed,LOW);
   digitalWrite(RedLed,HIGH);
   goto cont;//go directly to line 71
```

```
    }
}


 count++;



  if(card == 1 && statu[s] == 0){




    if(appear==1){
    statu[s]=1;
   Serial.print(Name);
   Serial.println(" Issues  ");

    }

    else{
     Serial.println("Scan USER first");
    }
  }

    else if(card == 1 && statu[s] == 1){



    if(appear==1){
    statu[s]=0;
   Serial.print(Name);
   Serial.println(" Returns ");
```

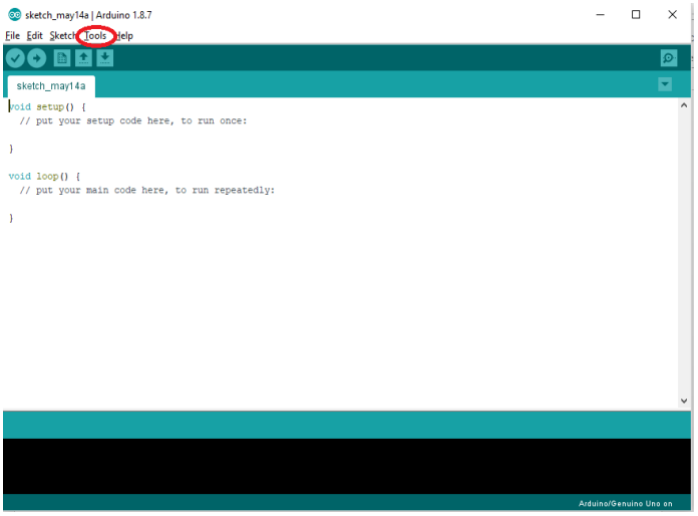
```
  }
  else{
    Serial.println("Scan USER first");
  }
  }

  else if(card == 2 && statu[s]==0){
 if(appear==1)
 {
       statu[s]=1;
       Serial.print(Name);
       Serial.println(" Issues ");
  }

 else{
    Serial.print("Scan USER first");
  }

  }


   else if(card == 2 && statu[s]==1){
  if(appear==1)
  {

       statu[s]=0;
       Serial.print(Name);//send the Name to excel
       Serial.println(" Returns ");
  }
```

```
  else{
     Serial.println("Scan USER first");
    }



    }

    else if(card == i ){
   // statu[s]=1;
    if(appear==0){
    appear=1;
    Serial.println( Name);//send the Name to excel

    }
    else
    {
     appear=0;
     Serial.println( "GOOD BYE");
    }

    }

//     else if(j == 0 && statu[s]==1){
//     statu[s]=0;
//     z=0;
//
//     //Serial.println( Name);//send the Name to excel
//     Serial.println( "GOOD BYE");
//
```

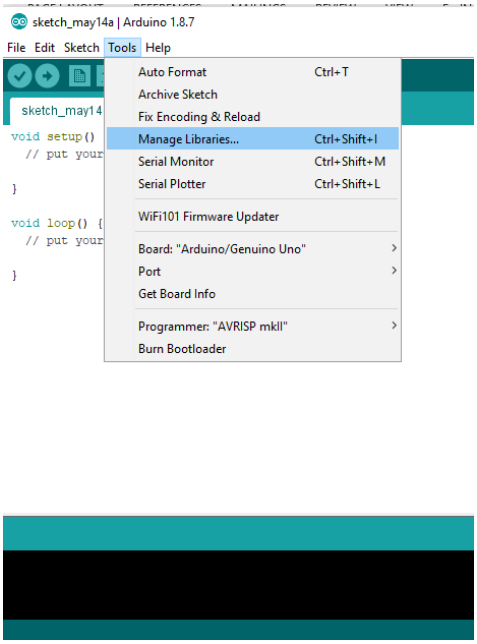
```
//     }
//
     digitalWrite(GreenLed,HIGH);
     digitalWrite(RedLed,LOW);
     digitalWrite(Buzzer,HIGH);
     delay(30);
     digitalWrite(Buzzer,LOW);
    // }
    // else if(statu[s] == 1){
    //Turn Red LED when the employee Already Left
   // digitalWrite(RedLed,HIGH);
    // }
    // delay(1000);
cont:
delay(2000);
digitalWrite(GreenLed,LOW);
digitalWrite(RedLed,LOW);


//if you want to close the Excel when all card had detected and save Excel file in Names Folder. in my case i have just 2 card (optional)
/*if(n==2){
   Serial.println("SAVEWORKBOOKAS,Names/WorkNames");
   Serial.println("FORCEEXCELQUIT");
   }*/
}
```

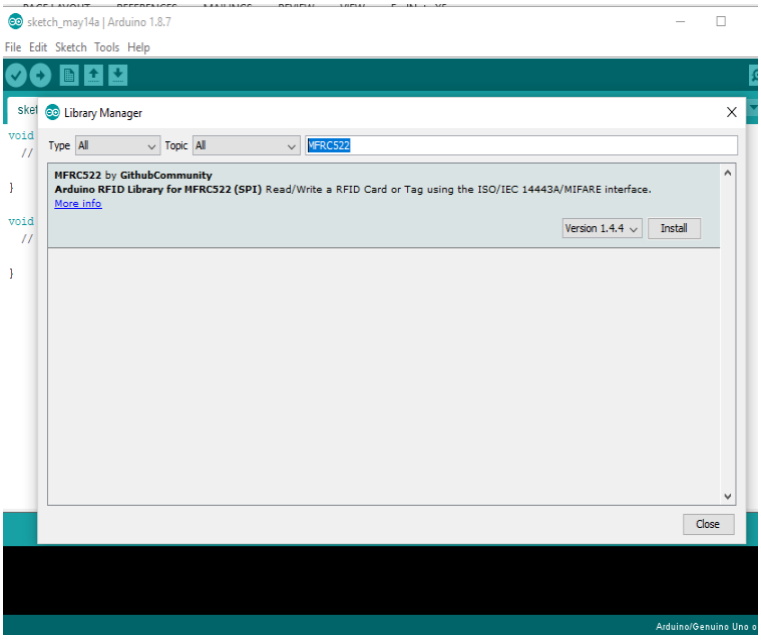
Procedure:

1. First thing first after setting up the hardware according to the above schematics open Arduino IDE, go to Tools

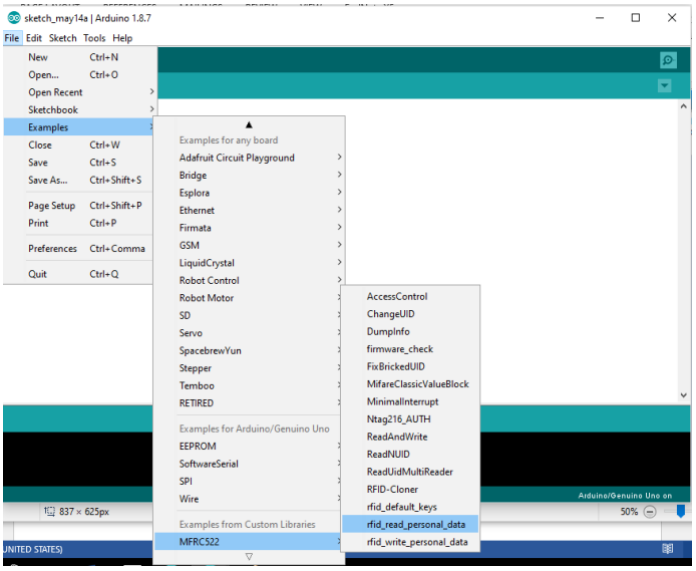


2. Then Manage Libraries and search MFRC522 and click on Install

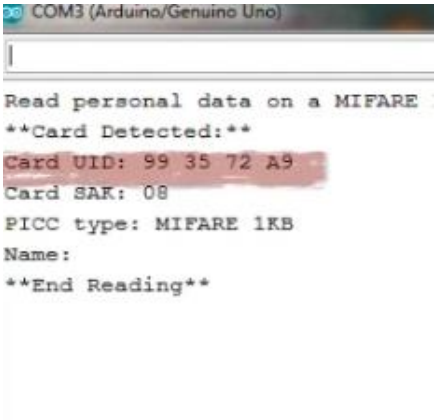




3. Now go to File, Examples , MFRC522 , rfid_read_personal_data



4. Upload this code to your Arduino and open serial Monitor from tools and scan the card. The reason we are doing this because we need the Hexa code id of the card because we need to use it in our attendance system code to register it.



5. Now as we have the hexa code open the RFID_Library.ino (Arduino file) and enter the hexa code in the following way as shown below (I have entered it in second UID you can enter in first too it is up to you). For the time being I have 2 RFID so I have only created 2 name. You need to enter Name.

```
#define SS_PIN 10 //RX slave select
#define RST_PIN 9

MFRC522 mfrc522(SS_PIN, RST_PIN); // Create MFRC522 ins

byte card_ID[4]; //card UID size 4byte
byte Name1[4]={0xD7,0x8A,0xDF,0x59};//first UID card
byte Name2[4]={0x99,0x35,0x72,0xA9};//second UID card
```

```
for (byte i = 0; i < mfrc522.uid.size; i++) {
    card_ID[i]=mfrc522.uid.uidByte[i];

     if(card_ID[i]==IssuedBy[i]){
     Name="Muaz Ata Ur Rehman";//Issuer Name
     card=0;

     s=0; \\status

    }
    else if(card_ID[i]==Book[i]){
     Name="Rasberry Pie in 24h";//Book Name

     card=1;
     s=0; \\status
```

6. We have to make some changes in the attendance system code there are three things you have to do. I am keeping it simple so that you guys could understand.
    a. Add a condition if no user is scanned then no book will be issued
    b. If book is scanned for the first time after user scan then status should be issue then again the status is changed to return
    c. Change the code in such a way so that the card can be scanned multiple times

7. The final output is in this form.