Appendix A

Code for RFID Based Voter Access:

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

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

#define greenled 14
#define redled 15
#define buzzer 8

LiquidCrystal lcd(2, 3, 4, 5, 6, 7);

void setup()
{
  Serial.begin(9600);   // Initiate a serial communication
  pinMode(greenled,OUTPUT);
  pinMode(redled,OUTPUT);
  pinMode(buzzer,OUTPUT);
  digitalWrite(greenled,LOW);
  digitalWrite(redled,LOW);
  digitalWrite(buzzer,LOW);
  Serial.println("WELCOME!!");
  lcd.begin(16, 2);
  lcd.setCursor(3, 0);
  lcd.print("WELCOME!!");
  delay(2000);
  lcd.clear();
  SPI.begin();      // Initiate  SPI bus
  mfrc522.PCD_Init();   // Initiate MFRC522
  Serial.println("Put your card to the reader...");
  Serial.println();
}

void loop()
{
  digitalWrite(greenled,LOW);
  digitalWrite(redled,LOW);
  digitalWrite(buzzer,LOW);
  lcd.clear();
  lcd.setCursor(0, 0);
```

```
lcd.print("Put your card to");
lcd.setCursor(0, 1);
lcd.print("the reader......");
delay(300);
 // Look for new cards
if ( ! mfrc522.PICC_IsNewCardPresent())
{
  return;
}
// Select one of the cards
if ( ! mfrc522.PICC_ReadCardSerial())
{
  return;
}
//Show UID on serial monitor
Serial.print("UID tag :");
String content= "";
byte letter;
for (byte i = 0; i < mfrc522.uid.size; i++)
{
  Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " ");
  Serial.print(mfrc522.uid.uidByte[i], HEX);
  content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));
  content.concat(String(mfrc522.uid.uidByte[i], HEX));
}
content.toUpperCase();

if (content.substring(1) == "B7 07 6D DD" ||content.substring(1) == "07 2A 6F DD" ||
content.substring(1) == "A7 F6 6B DD"|| content.substring(1) == "F2 72 28 2E"||
content.substring(1) == "A7 B5 6C DD"|| content.substring(1) == "67 9E 6A DD")
{
if (content.substring(1) == "B7 07 6D DD")
{
  digitalWrite(greenled,HIGH);
  delay(2000);
  lcd.setCursor(0, 0);
  lcd.print("ID : ");
  lcd.print(content.substring(1));
  lcd.setCursor(0, 1);
  lcd.print("Valid access");
  Serial.println("  Valid access");
  delay(2500);
  Serial.println("Name: K.M.PEASH ");
  Serial.println("DOB: 16 Jan 1996");
  lcd.setCursor(0, 0);
  lcd.print("Name: K.M.PEASH ");
```

```
    lcd.setCursor(0, 1);
    lcd.print("DOB: 16 Jan 1996");
    delay(2500);
    lcd.clear();
    lcd.setCursor(3, 0);
    lcd.print("THANK YOU.");
    delay(1000);
  }
if (content.substring(1) == "07 2A 6F DD") //change here the UID of the card/cards that you
want to give access
  {
    digitalWrite(greenled,HIGH);
    delay(2000);
    lcd.setCursor(0, 0);
    lcd.print("ID : ");
    lcd.print(content.substring(1));
    lcd.setCursor(0, 1);
    lcd.print("Valid access");
    Serial.println("  Valid access");
    delay(2500);
    Serial.println("Name: RAZIBUL   ");
    Serial.println("DOB: 26 Jun 1996");
    lcd.setCursor(0, 0);
    lcd.print("Name: RAZIBUL   ");
    lcd.setCursor(0, 1);
    lcd.print("DOB: 26 Jun 1996");
    delay(2500);
    lcd.clear();
    lcd.setCursor(3, 0);
    lcd.print("THANK YOU.");
    delay(1000);
  }
if (content.substring(1) == "A7 F6 6B DD") //change here the UID of the card/cards that you
want to give access
  {
    digitalWrite(greenled,HIGH);
    delay(2000);
    lcd.setCursor(0, 0);
    lcd.print("ID : ");
    lcd.print(content.substring(1));
    lcd.setCursor(0, 1);
    lcd.print("Valid access");
    Serial.println("  Valid access");
    delay(2500);
    Serial.println("Name: Tanvir    ");
    Serial.println("DOB: 29 Dec 1996");
```

```
      lcd.setCursor(0, 0);
      lcd.print("Name: Tanvir    ");
      lcd.setCursor(0, 1);
      lcd.print("DOB: 29 Dec 1996");
      delay(2500);
      lcd.clear();
      lcd.setCursor(3, 0);
      lcd.print("THANK YOU.");
      delay(1000);
    }
if (content.substring(1) == "F2 72 28 2E") //change here the UID of the card/cards that you
want to give access
    {
      digitalWrite(greenled,HIGH);
      delay(2000);
      lcd.setCursor(0, 0);
      lcd.print("ID : ");
      lcd.print(content.substring(1));
      lcd.setCursor(0, 1);
      lcd.print("Valid access");
      Serial.println("  Valid access");
      delay(2500);
      Serial.println("Name: Nayeem    ");
      Serial.println("DOB: 23 May 1996");
      lcd.setCursor(0, 0);
      lcd.print("Name: Nayeem    ");
      lcd.setCursor(0, 1);
      lcd.print("DOB: 23 May 1996");
      delay(2500);
      lcd.clear();
      lcd.setCursor(3, 0);
      lcd.print("THANK YOU.");
      delay(1000);
    }
if (content.substring(1) == "A7 B5 6C DD") //change here the UID of the card/cards that you
want to give access
    {
      digitalWrite(greenled,HIGH);
      delay(2000);
      lcd.setCursor(0, 0);
      lcd.print("ID : ");
      lcd.print(content.substring(1));
      lcd.setCursor(0, 1);
      lcd.print("Valid access");
      Serial.println("  Valid access");
      delay(2500);
```

```
    Serial.println("Name: Mizanur   ");
    Serial.println("DOB: 13 Jul 1996");
    lcd.setCursor(0, 0);
    lcd.print("Name: Mizanur   ");
    lcd.setCursor(0, 1);
    lcd.print("DOB: 13 Jul 1996");
    delay(2500);
    lcd.clear();
    lcd.setCursor(3, 0);
    lcd.print("THANK YOU.");
    delay(1000);
  }
if (content.substring(1) == "67 9E 6A DD") //change here the UID of the card/cards that you
want to give access
  {
    digitalWrite(greenled,HIGH);
    delay(2000);
    lcd.setCursor(0, 0);
    lcd.print("ID : ");
    lcd.print(content.substring(1));
    lcd.setCursor(0, 1);
    lcd.print("Valid access");
    Serial.println("  Valid access");
    delay(2500);
    Serial.println("Name: Ahmudur   ");
    Serial.println("DOB: 05 Jun 1996");
    lcd.setCursor(0, 0);
    lcd.print("Name: Ahmudur   ");
    lcd.setCursor(0, 1);
    lcd.print("DOB: 05 Jun 1996");
    delay(2500);
    lcd.clear();
    lcd.setCursor(3, 0);
    lcd.print("THANK YOU.");
    delay(1000);
    }
 }
 else {
    digitalWrite(redled,HIGH);
    delay(2000);
    digitalWrite(buzzer,HIGH);
    delay(2000);
    lcd.setCursor(0, 0);
    lcd.print("ID : ");
    lcd.print(content.substring(1));
    lcd.setCursor(0, 1);
```

```
      lcd.print("UNKNOWN ID");
      delay(2500);
      Serial.println("  UNKNOWN ID");
      lcd.setCursor(0, 0);
      lcd.print("Access denied...");
      Serial.println(" Access denied");
      delay(2500);
      }
}
```