AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

Faculty of Engineering

Project Lab Report

Experiment Title: ***RFID BASED BUS SCHEDULING & TICKETING SYSTEM.***

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Course Title:	MICROPROCESSOR AND E MBEDDED SYSTEMS LAB		
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Course Teacher:	**Prof. Dr. Engr. Muhibul Haque Bhuyan**		

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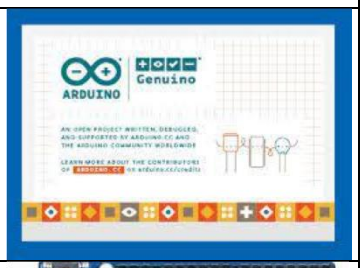
Abstract :

The main goal of this project bus transport system has problems due to paper travel throughout the bus if there's a rush and there are many cases of someone losing a ticket. The money change causes quarrels among passengers and conductors and the problems are solved by making a much more public-friendly system that will provide a systematic traveling experience. In this experiment, the software named Arduino IDE and Tinkercad was used. At first, this experiment was done with the help of the Arduino IDE software with hardware set up in the lab session. For a better understanding of the simulation software, Tinkercad was used to implement this experiment at home.

Objectives

In this project our goal is to install two RFID scanners on a bus. One RFID scanner will be outside, on scanning an RFID card it will store the current location and time of the passenger and unlock the door. The other RFID scanner will be inside the bus on scanning, it will calculate the fare of the passenger from saved location and time and the amount will be deducted from any online banking applications such as BKASH, NAGAD of the passenger.

Equipment List

No	Equipment Name	Figure
1	Arduino IDE (any version) Software	
2	Arduino Uno (R3) board	
3	Resistors	
4	RFID Scanner (MFRC522)	

5	LED (Red, Green)	
6	Tinkercad	

Circuit Diagram

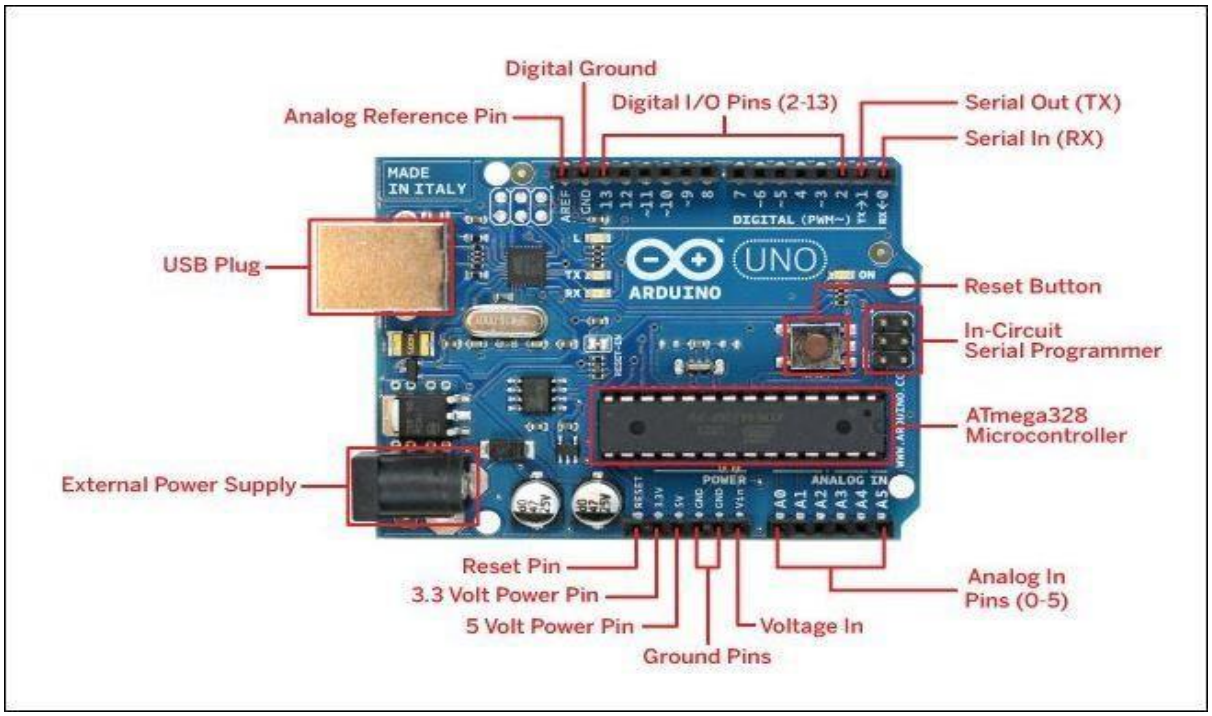


Figure 1: Arduino Board

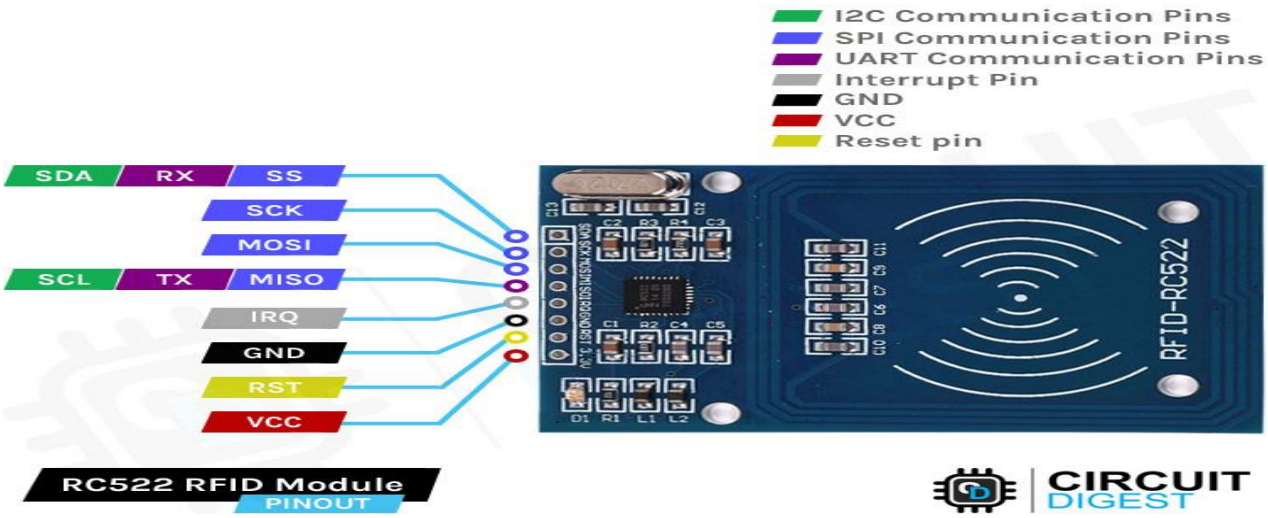
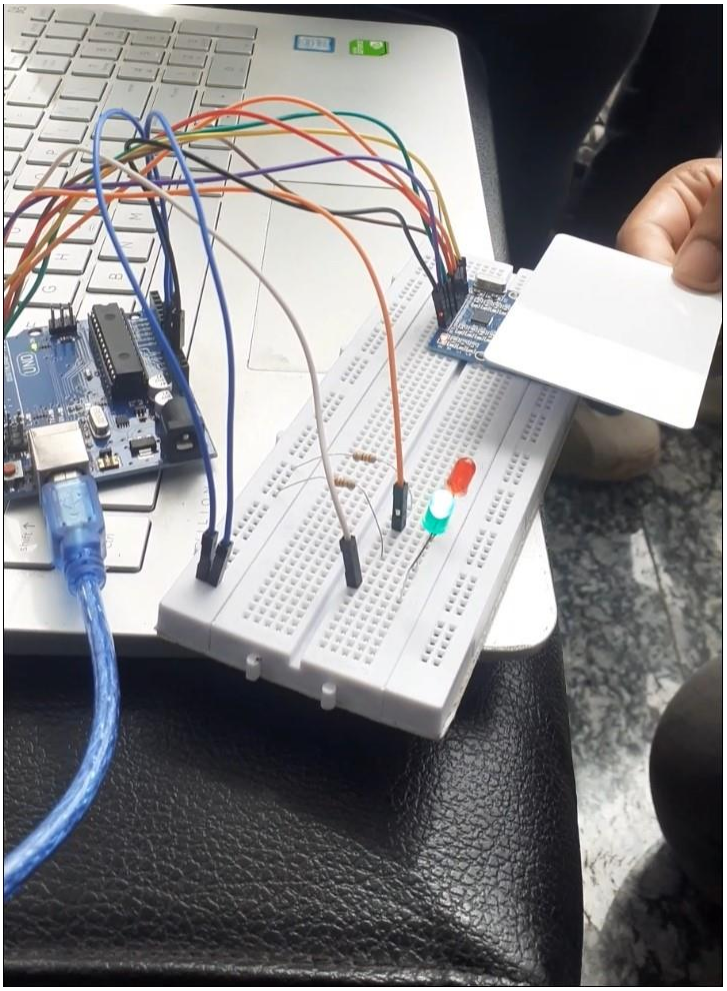
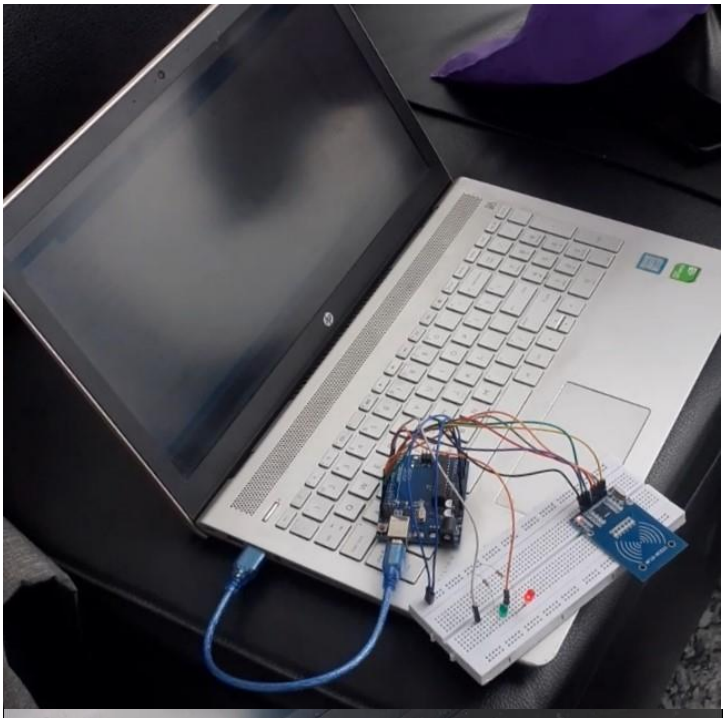


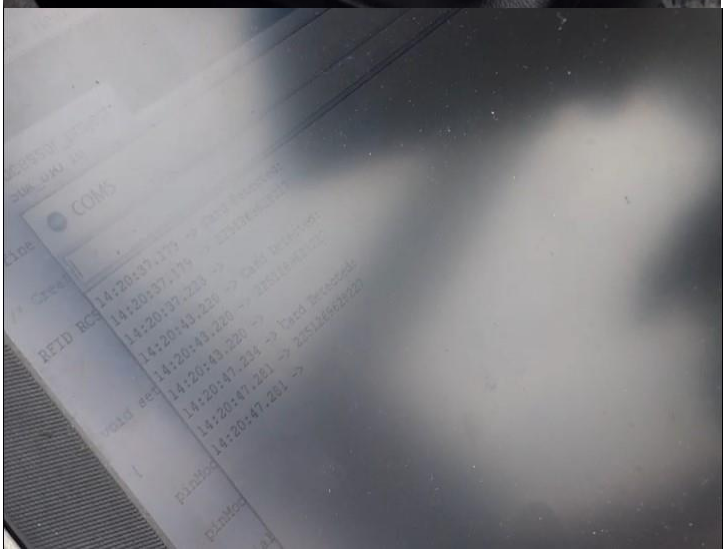
Figure 2: RFID Scanner (MFRC522)

Hardware Set-Up



Hardware Results





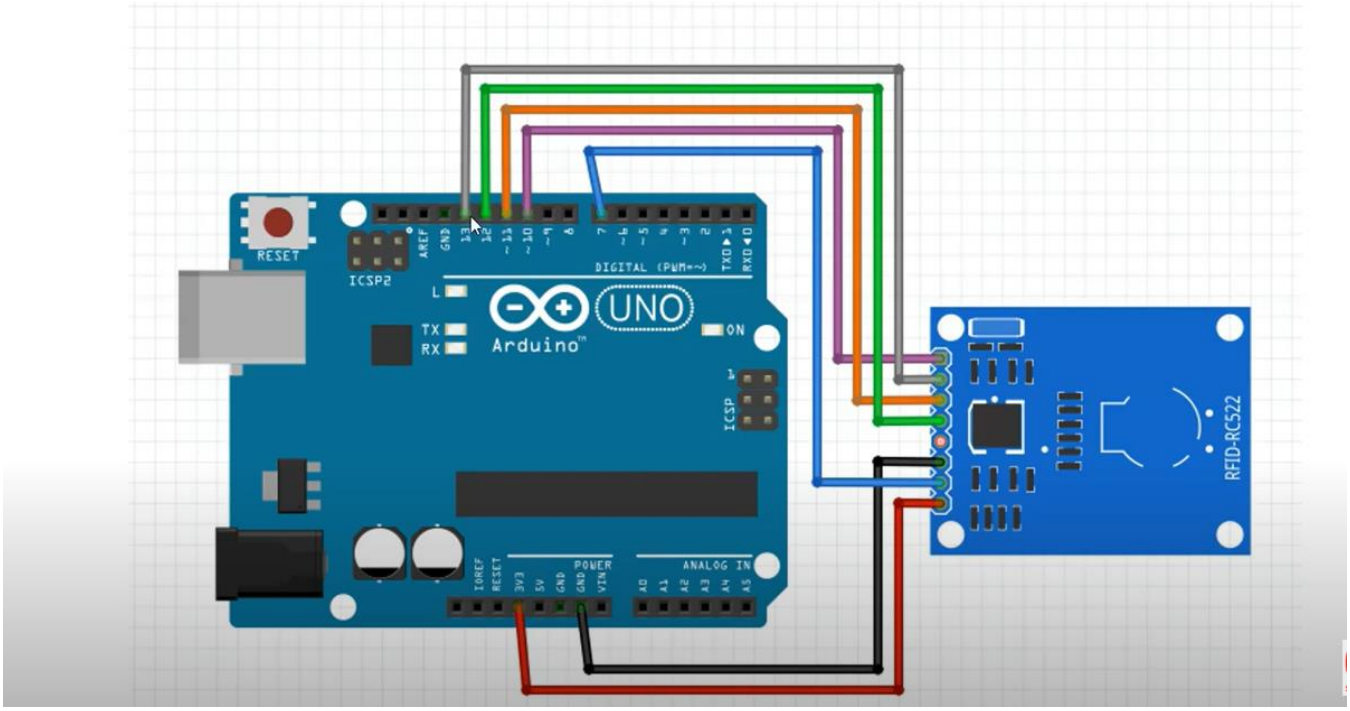
Explanation Of Code

```
/*
PINOUT:
RC522 MODULE Uno/Nano MEGA
SDA D10 D9
SCK D13 D52
MOSI D11 D51
MISO D12 D50
IRQ N/A N/A
GND GND GND
RST D9 D8
3.3V 3.3V 3.3V
*/
/* Include the standard Arduino SPI library */
#include <SPI.h>
/* Include the RFID library */
#include <RFID.h>

/* Define the DIO used for the SDA (SS) and RST (reset) pins. */
#define SDA_DIO 10
#define RESET_DIO 9
/* Create an instance of the RFID library */
RFID RC522(SDA_DIO, RESET_DIO);

void setup()
{
pinMode(2, OUTPUT);
pinMode(3, OUTPUT);
```

```
Serial.begin(9600);
/* Enable the SPI interface */
SPI.begin();
/* Initialise the RFID reader */
RC522.init();
}

void loop()
{
digitalWrite(2, LOW);
digitalWrite(3, LOW);
/* Has a card been detected? */
if (RC522.isCard())
{
/* If so then get its serial number */
RC522.readCardSerial();
Serial.println("Card detected:");
digitalWrite(2, HIGH);
digitalWrite(3, LOW);
for(int i=0;i<5;i++)
{
Serial.print(RC522.serNum[i],DEC);
//Serial.print(RC522.serNum[i],HEX); //to print card detail in Hexa Decimal format
}
Serial.println();
Serial.println();
}
else if(!RC522.isCard()){
digitalWrite(2, LOW);
digitalWrite(3, HIGH);
```

```
}
delay(2000);
}
```

Simulation Set-Up



Discussion

The major advantage of this system is that this stays closer to future ticketing system. RFID system used here can be useful in IoT formation as object and human information collection is the biggest challenge in IoT. So implementation of such a system can be considered as primary step towards fully operational IoT. Having a system to scheduling and ticketing system can save a lot of time and without the confusion of regarding fares passenger can have a pleasant time traveling from on place to another. Our project works to reduce any unwanted events that can be avoided as all the person carrying RFID tickets are monitored every time they travel.

Conclusion

Automation of such technology maybe become one of the ruling factors of the present world. We tried to implement the most efficient and easy way to automate the transaction system used in the public transports.

References

[1] Kwangho Jung , Sabinne Lee, “A systematic review of RFID applications and diffusion: key areas and public policy issues”, A Review of RFID applications.pdf

[2] Filippo Costa, Simone Genovesi , Michele Borgese , Andrea Michel ,Francesco Alessio Dicandia and Giuliano Manara,” A Review of RFID Sensors, the New Frontier of Internet of Things”, Sensors | Free Full-Text | A Review of RFID Sensors, the New Frontier of Internet of Things (mdpi.com).

[3] Fatma El-zahraa El-taher , Ayman Taha , Jane Courtney and Susan Mckeever , “A Systematic Review of Urban Navigation Systems for Visually Impaired