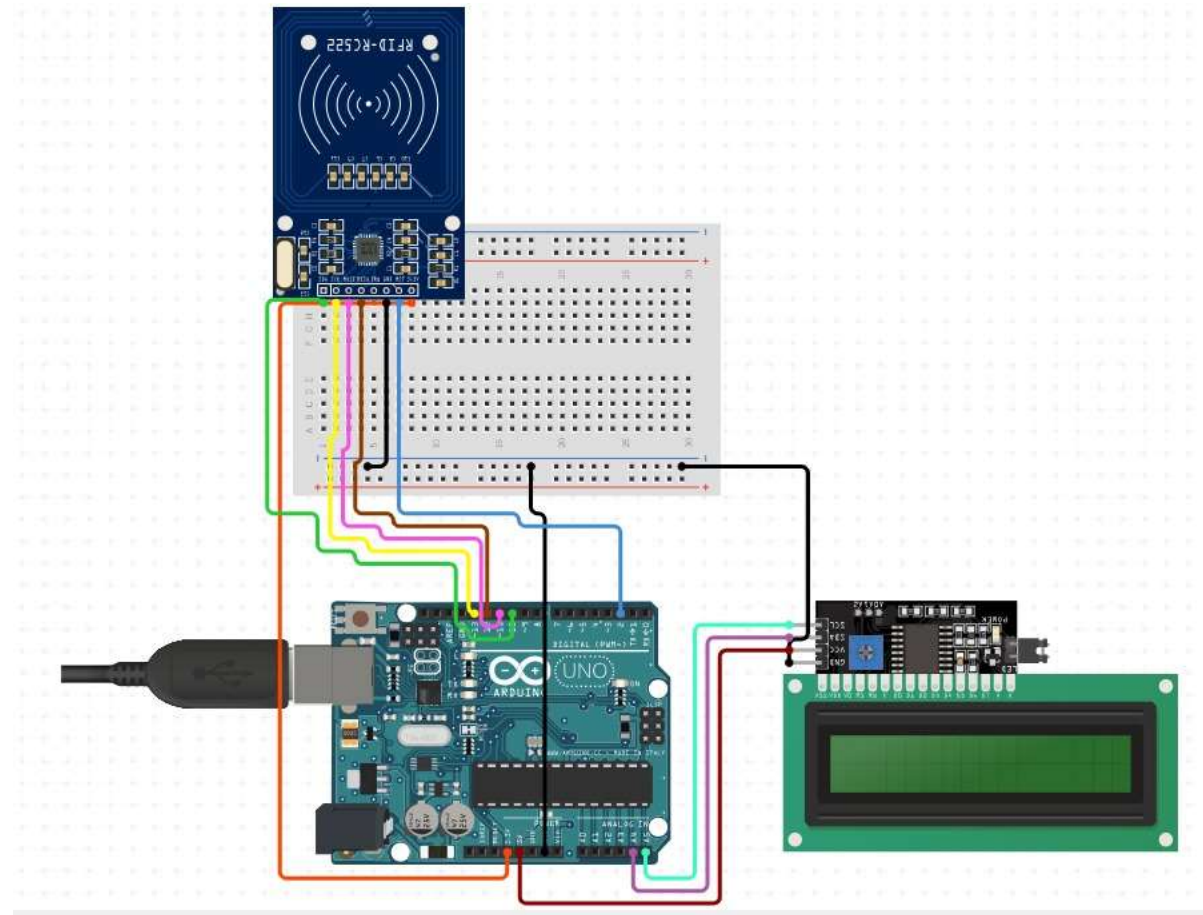# RFID Based Automation of Billing System

Basic: The project Arduino and RFID based billing system is a simple and is used at any place where we need to do billing of products(containing RFID tags)

Components Used: 1.Arduino Uno
      2.RFID-MRC522
      3.LCD Display 16*2 IC
      4.BreabBoard-half size
      5.USB Cable A to B
      6.Jumper wires-M/M and M/F

Arduino Uno- The work of arduino here is to interface with the RFID Module, that is RC522 and it communicates with the reader through SPI protocol.The operating frequency is 13.56MHz.

RFID MRC522-MF RC522 is a highly integrated read and write card chip applied to the 13.56MHz contactless communication.The MF RC522 uses advanced modulation and demodulation concept which fully presented in all types of 13.56MHz passive contactless communication methods and protocols

LCD Display 16*2 IC- A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits.A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

Breadoard-A breadboard is a solderless device for temporary prototype with electronics and test circuit designs.

USB cable A to B-A breadboard is a solderless device for temporary prototype with electronics and test circuit designs.

Jumper wires-A jump wire (also known as jumper wire, or jumper) is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

The working of the machine:

- Step 1- First the RFID tags are scanned by the reader, combination of RC522+Arduino and then the data is sent through the SPI protocol
- Step 2: The ESP module (to be used in later operations) would transmit the data scanned from the RFID module to the host server and the data of the products would be transmitted to the arduino module
- Step 3: In the arduino modeule, the function to calculate sum of the priducts scanned would be operating and the output fo the same will be displayed on the 16*2 LCD Display.

- Step 4: The data from LCD Display would also be trasmitted to the host server through the ESP module and a scanned() but would be considered true.

- Step5: After the payment is done, the customer would go upto the exit gate and again gets the tags scanned by a RFID reader present at the exit gate, here the RFID reader will scan atleast one of the tags and search for the folder of the customer in the server directory and would put the paid() but as true.

- The infrared door sensor will unlock only when the scanned() and paid() bits are true

PIN DIAGRAM:

RFID RC-522 PIN	ARDUINO UNO PIN
SDA	10
SCK	13
MOSI	11
MISO	12
IRQ	UNUSED
GND	GND
RST	9
3.3V	3.3 V

The Implication of our Idea: