



# Smart Trolley: Automatic Billing System

## Why do we need an Automatic Billing Cart?

An automatic billing system in shopping carts is essential for several reasons whose prime aim is to streamline the checkout process.

The reasons why a smart trolley is needed are the following:

- Customers can check out quickly without waiting in long lines, leading to a smoother and more pleasant shopping experience. This is more prime in festive seasons when they don't have to wait in long checkout lines.
- People are budget-constrained many times when they go shopping. Thus a shopping cart which keeps showing the final bill amount will enable them to decide what to shop for further.
- Automatic billing systems often integrate with inventory management systems, ensuring real-time updates of stock levels.

## How much Scalable is the idea?

- The shopping carts are also scalable for retailers who manage large inventory and deal with many customers daily. Thus a device like this will also automate their process.
- This can be further integrated with a database where we can track customer's behaviour while shopping and use the data to generate insights making them accessible to particular malls and shops that can leverage it to make informed decisions.

## Components:

Arduino nano

16x2 LCD Display

EM-18 Module

Push Button

Red LED

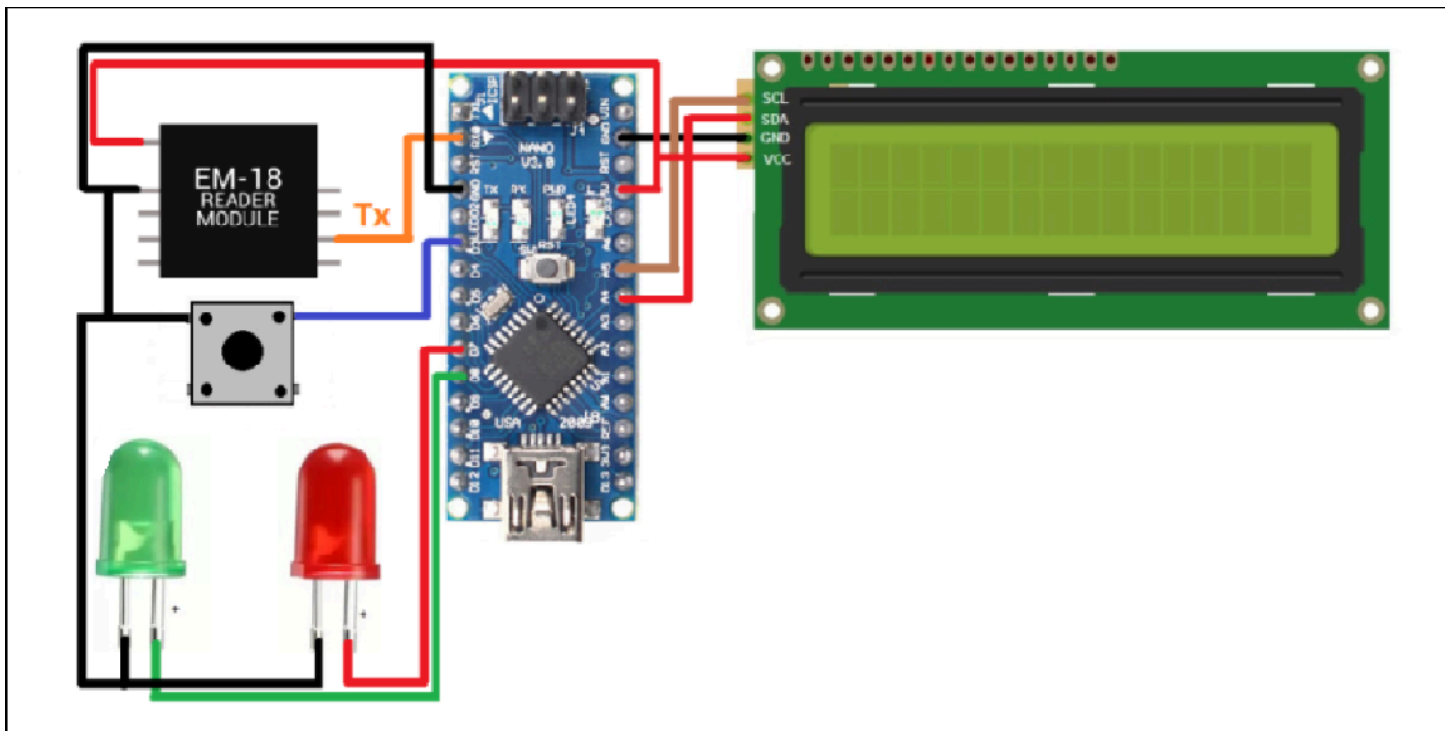
Green LED

Buzzer

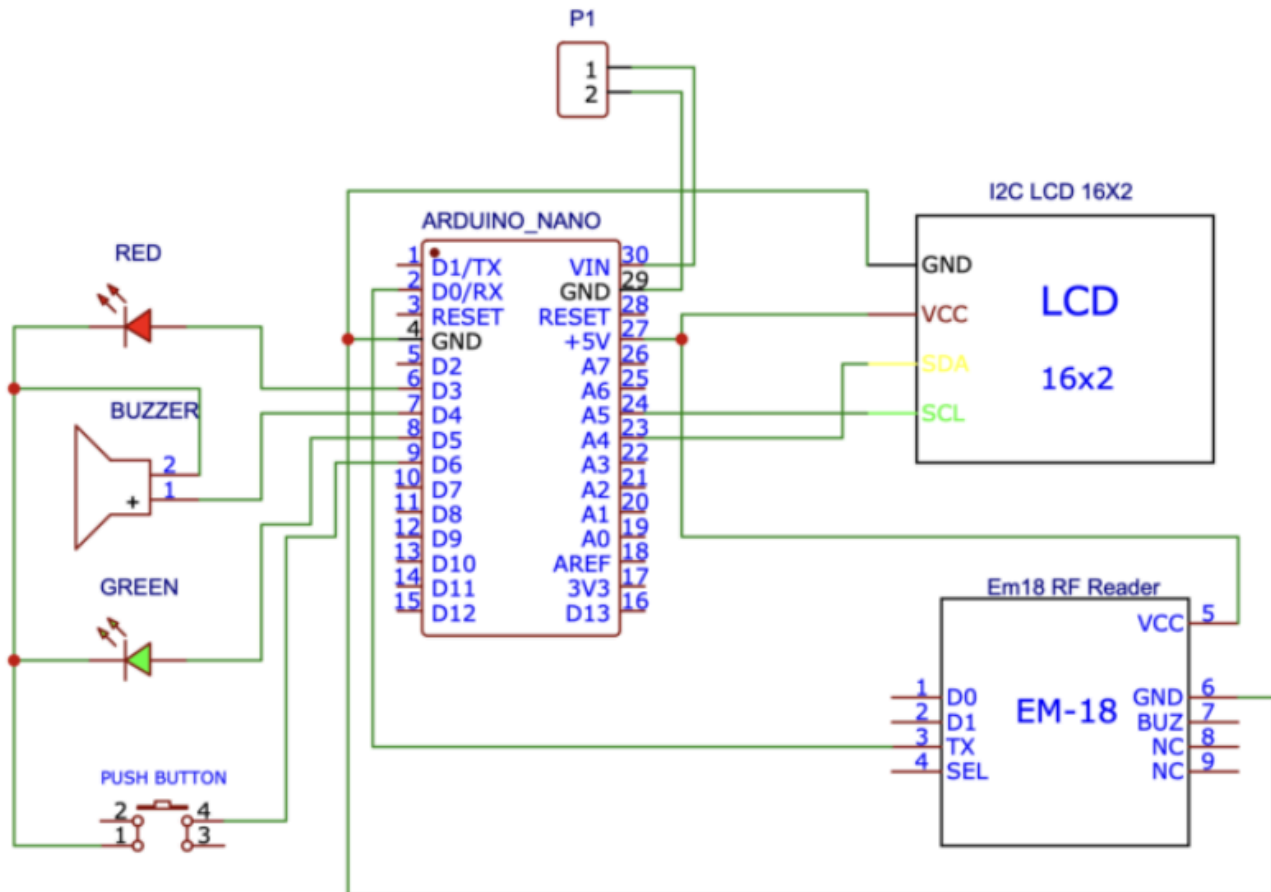
RFID Tag

Zero PCB

## Circuit Simulations:



## PCB Design:



**Code:**

**Reading RFID Tags:**

```
int count = 0;
```

```
char card_no[12];
```

```
void setup()
```

```
{
```

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

```
}
```

```
void loop()
```

```
{
```

```
    if(Serial.available())
```

```
    {
```

```
count = 0;

while(Serial.available() && count < 12)

{

    card_no[count] = Serial.read();

    count++;

    delay(5);

}

Serial.print(card_no);

}

}
```

### **Final Code:**

```
#include <Arduino.h>

#include <Wire.h>

#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

char input[12];

int count = 0;

int a;

int p1 = 0, p2 = 0, p3 = 0, p4 = 0;

int c1 = 0, c2 = 0, c3 = 0, c4 = 0;

double total = 0;
```

```
int count_prod = 0;

void setup ()
{
    pinMode(A4, INPUT_PULLUP);
    pinMode(6, OUTPUT);
    pinMode(7, OUTPUT);
    pinMode(5, OUTPUT);

    lcd.init();
    lcd.backlight();
    lcd.clear();
    Wire.begin();
    Serial.begin(9600);
    lcd.setCursor(0, 0);
    lcd.print(" AUTOMATIC BILL");
    delay (2000);
    lcd.setCursor(0, 1);
    lcd.print(" SHOPPING CART ");
    delay (2000);
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Plz Add iTem");

}
```

```
void loop()

{

    count = 0;

    while (Serial.available() && count < 12)

    {

        input[count] = Serial.read();

        count++;

        delay(5);

    }

    int a = digitalRead(A4);

    if ((strcmp(input, "xxxxxxxxxx", 12) == 0) && (a == 1))

    {

        lcd.setCursor(0, 0);

        lcd.print("Rice Added   ");

        lcd.setCursor(0, 1);

        lcd.print("Price :- 10.00   ");

        p1++;

        digitalWrite(6, HIGH);

        digitalWrite(7, HIGH);

        digitalWrite(5, LOW);

        delay(2000);

        total = total + 10.00;

        count_prod++;
```

```
digitalWrite(7, LOW);

digitalWrite(6, LOW);

digitalWrite(5, HIGH);

}

else if ((strcmp(input, "xxxxxxxxxx", 12) == 0) && (a == 0))

{

    if (p1 > 0)

    {

        lcd.clear();

        lcd.setCursor(0, 0);

        lcd.print("Rice Removed!!!    ");

        digitalWrite(6, HIGH);

        digitalWrite(7, HIGH);

        digitalWrite(5, LOW);

        delay(2000);

        p1--;

        total = total - 10.00;

        count_prod--;

        lcd.clear();

        digitalWrite(6, LOW);

        digitalWrite(7, LOW);

        digitalWrite(5, HIGH);

        lcd.clear();

        lcd.setCursor(0, 0);
```

```

lcd.print("Total Price :-");

lcd.setCursor(0, 1);

lcd.print(total);
}

else
{
    lcd.clear();

    lcd.setCursor(0, 0);

    lcd.print("Not in cart!!! ");

    digitalWrite(7, HIGH);

    digitalWrite(6, HIGH);

    digitalWrite(5, HIGH);

    delay(2000);

    digitalWrite(7, LOW);

    digitalWrite(6, LOW);

    digitalWrite(5, LOW);

    lcd.clear();
}
}

if ((strcmp(input, "xxxxxxxxxx", 12) == 0) && (a == 1))
{
    lcd.setCursor(0, 0);

```



```

    lcd.print("Coffee Added    ");

    lcd.setCursor(0, 1);

    lcd.print("Price :- 20.00    ");

    p2++;

    digitalWrite(7, HIGH);

    digitalWrite(6, HIGH);

    digitalWrite(5, LOW);

    delay(2000);

    total = total + 20.00;

    count_prod++;

    digitalWrite(7, LOW);

    digitalWrite(6, LOW);

    digitalWrite(5, HIGH);

}

else if ((strcmp(input, "xxxxxxxxxx", 12) == 0) && (a == 0))
{
    if (p2 > 0)
    {
        lcd.clear();

        lcd.setCursor(0, 0);

        lcd.print("Coffee Removed!!!    ");

        digitalWrite(7, HIGH);

        digitalWrite(6, HIGH);

```

```
digitalWrite(5, LOW);

delay(2000);

p2--;

total = total - 20.00;

count_prod--;

lcd.clear();

digitalWrite(7, LOW);

digitalWrite(6, LOW);

digitalWrite(5, HIGH);

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("Total Price :-");

lcd.setCursor(0, 1);

lcd.print(total);

}

else

{

    lcd.clear();

    lcd.setCursor(0, 0);

    lcd.print("Not in cart!!! ");

    digitalWrite(7, HIGH);

    digitalWrite(6, HIGH);

    digitalWrite(5, HIGH);

    delay(2000);

    digitalWrite(7, LOW);
```

```
digitalWrite(6, LOW);  
  
digitalWrite(5, LOW);  
  
lcd.clear();  
  
}  
  
}
```

```
if ((strcmp(input, "xxxxxxxxxx", 12) == 0) && (a == 1))
```

```
{  
  
    lcd.setCursor(0, 0);  
  
    lcd.print("Oil Added    ");  
  
    lcd.setCursor(0, 1);  
  
    lcd.print("Price :- 25.00    ");  
  
    p3++;  
  
    digitalWrite(7, HIGH);  
  
    digitalWrite(6, HIGH);  
  
    digitalWrite(5, LOW);  
  
    delay(2000);  
  
    total = total + 25.00;  
  
    count_prod++;  
  
    digitalWrite(7, LOW);  
  
    digitalWrite(6, LOW);  
  
    digitalWrite(5, HIGH);  
  
}
```

```
else if ((strcmp(input, "xxxxxxxxxx", 12) == 0) && (a == 0))  
{  
    if (p3 > 0)  
    {  
        lcd.clear();  
        lcd.setCursor(0, 0);  
        lcd.print("Oil Removed!!!  ");  
        digitalWrite(7, HIGH);  
        digitalWrite(6, HIGH);  
        digitalWrite(5, LOW);  
        delay(2000);  
        p3--;  
        total = total - 25.00;  
        count_prod--;  
        lcd.clear();  
        digitalWrite(7, LOW);  
        digitalWrite(6, LOW);  
        digitalWrite(5, HIGH);  
        lcd.clear();  
        lcd.setCursor(0, 0);  
        lcd.print("Total Price :-");  
        lcd.setCursor(0, 1);  
        lcd.print(total);  
    }  
}
```

```
else  
  
{  
  
  lcd.clear();  
  
  lcd.setCursor(0, 0);  
  
  lcd.print("Not in cart!!!  ");  
  
  digitalWrite(7, HIGH);  
  
  digitalWrite(6, HIGH);  
  
  digitalWrite(5, HIGH);  
  
  delay(2000);  
  
  digitalWrite(7, LOW);  
  
  digitalWrite(6, LOW);  
  
  digitalWrite(5, LOW);  
  
  lcd.clear();  
  
}  
  
}  
  
}
```

*Thank  
you!*