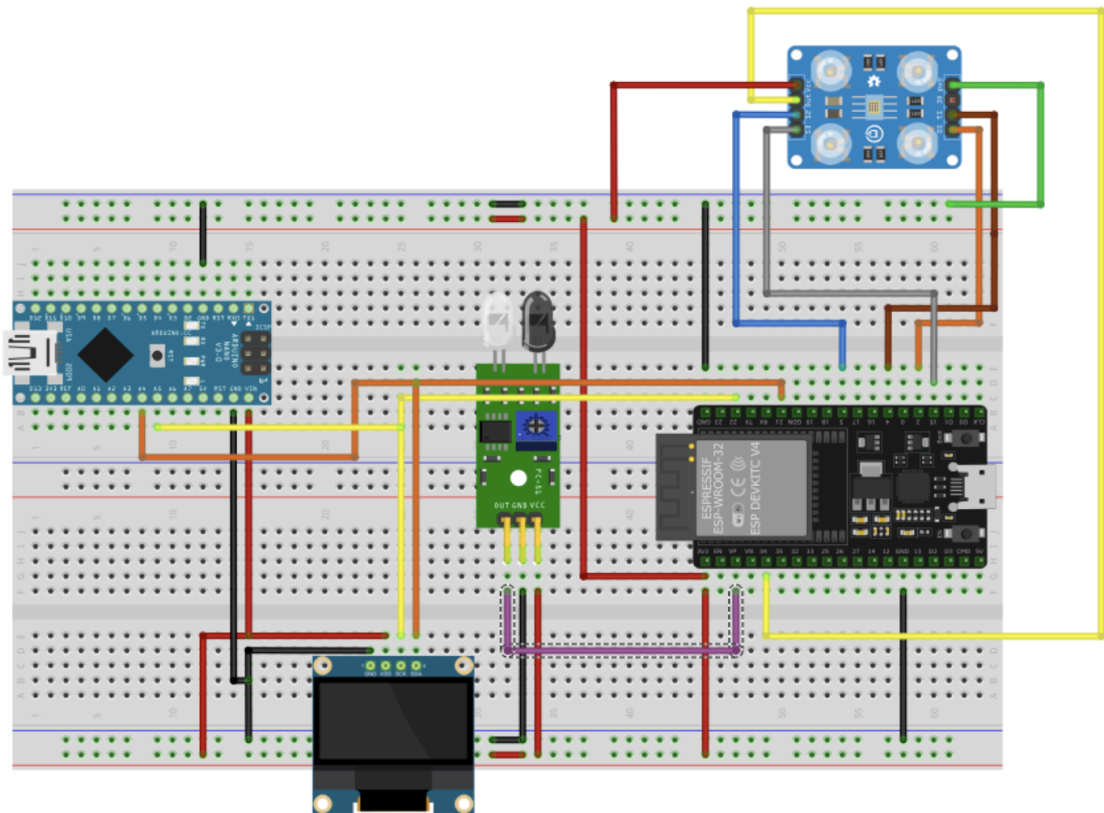


## Problem Statement

The objective of this project is to design and build a counting system using smart sensors for the currency production and manufacturing industries increase in accuracy of counting the currency. Different techniques have been used to design and improve the counter machine. In this project, we are using Arduino. To count the currencies we are using color sensor which senses the color of the note and shows the value of that note. These values will display on LCD display.

The implementation of this device helps to reduce the huge load spent over by the companies for ages . This project gives brief description about an assistive system designed for industries in order to help them bring more accuracy over counting system to reduce the huge loss and saves money.

**Schematic diagram:**



**Fig 1:Describes the Schematic diagram for Smart Currency counting machine**

## **Embedded C code:**

```
#include <WiFi.h>
#include <WebServer.h>
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>

#define SCREEN_WIDTH 128
#define SCREEN_HEIGHT 64

#define OLED_RESET -1
Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, OLED_RESET);

const char* ssid = "iPhone";
const char* password = "qwertyuio";

WebServer server(80);

String page = "";
int count_100 = 0;
int count_200 = 0;
unsigned int frequency = 0;

int a = 0, b = 0;
int total = 1000;

void setup() {
```

```
pinMode(2, OUTPUT); // S0
pinMode(4, OUTPUT); // S1
pinMode(5, OUTPUT); // S2
pinMode(15, OUTPUT); // S3
pinMode(34, INPUT); // OUT
```

```
digitalWrite(2, HIGH);
digitalWrite(4, LOW);
```

```
Serial.begin(9600);
Wire.begin(21, 22); // SDA, SCL
```

```
if (!display.begin(SSD1306_SWITCHCAPVCC, 0x3C)) {
  Serial.println(F("SSD1306 allocation failed"));
  for (;;) {}
}
delay(2000);
display.clearDisplay();
```

```
display.setTextSize(1);
display.setTextColor(SSD1306_WHITE);
display.setCursor(3, 0);
display.println("WELCOME TO");
display.setCursor(3, 10);
display.println("IOT DESIGN");
display.display();
delay(2000);
display.clearDisplay();
```

```
WiFi.begin(ssid, password);
```

```

while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    display.setCursor(0, 0);
    display.println("WiFi connecting...");
    display.display();
}
display.clearDisplay();
display.setCursor(0, 0);
display.println("WiFi connected");
display.setCursor(0, 10);
display.println(WiFi.localIP());
display.display();
delay(1500);

display.clearDisplay();

server.on("/", []) {
    page = "<html><head><title>Currency counter using IoT</title>";
    page += "</head><style type='text/css'>table {border-collapse: collapse;";
    page += "}table, th, td {border: 1px solid black;font-size: larger;";
    page += "text-align:center;}</style><body><center><h1>Currency Counter Using IoT ";
    page += "</h1><h3></h3><br><br>";
    page += "<table style='width: 600px;height: 250px;'><tr><th>Currency</th>";
    page += "><th>Quantity</th></tr><tr><td>Rs. 100</td><td>" + String(count_100) +
"</td></tr><tr>";
    page += "<td>Rs. 200</td><td>" + String(count_200) + "</td></tr><tr><th>Total
Balance:</th><td>";
    page += String(total) + "</td></tr></table></center></body></html>";
    page += "<meta http-equiv='refresh' content='2'>";
    server.send(200, "text/html", page);
});

```

```
server.begin();  
}
```

```
void loop() {  
  int sensor = analogRead(A0);  
  int red1 = red();  
  int blue1 = blue();  
  int green1 = green();
```

```
// Display RGB sensor values
```

```
Serial.print("Red : ");  
Serial.println(red1);  
Serial.print("Blue : ");  
Serial.println(blue1);  
Serial.print("Green : ");  
Serial.println(green1);
```

```
// Condition for detecting Rs. 200 note
```

```
if (red1 >= 40 && red1 <= 60 && blue1 >= 70 && blue1 <= 90 && green1 >= 10 && green1  
<= 30 && a == 0 && sensor > 500) {  
  a = 1;  
} else if (sensor <= 500 && a == 1) {  
  a = 0;  
  if (total >= 200) {  
    display.clearDisplay();  
    display.setTextSize(1);  
    display.setTextColor(SSD1306_WHITE);  
    display.setCursor(0, 10);  
    display.println("200 Rupees!!!");  
    display.display();  
    total -= 200;
```

```
    delay(2000);  
    count_200++;  
    display.clearDisplay();  
}  
}
```

**// Condition for detecting Rs. 100 note**

```
if (red1 >= 60 && red1 <= 90 && blue1 >= 65 && blue1 <= 90 && green1 >= 10 && green1  
<= 30 && b == 0 && sensor > 500) {  
    b = 1;  
} else if (sensor <= 500 && b == 1) {  
    b = 0;  
    if (total >= 100) {  
        display.clearDisplay();  
        display.setTextSize(1);  
        display.setTextColor(SSD1306_WHITE);  
        display.setCursor(0, 10);  
        display.println("100 Rupees!!!");  
        display.display();  
        total -= 100;  
        count_100++;  
        delay(2000);  
        display.clearDisplay();  
    }  
}
```

**// Display total balance**

```
display.clearDisplay();  
display.setTextSize(1);  
display.setTextColor(SSD1306_WHITE);  
display.setCursor(0, 0);
```

```
display.println("Total Bal:");
display.setCursor(60, 0);
display.println(total);
display.display();

delay(1000);
server.handleClient();
}

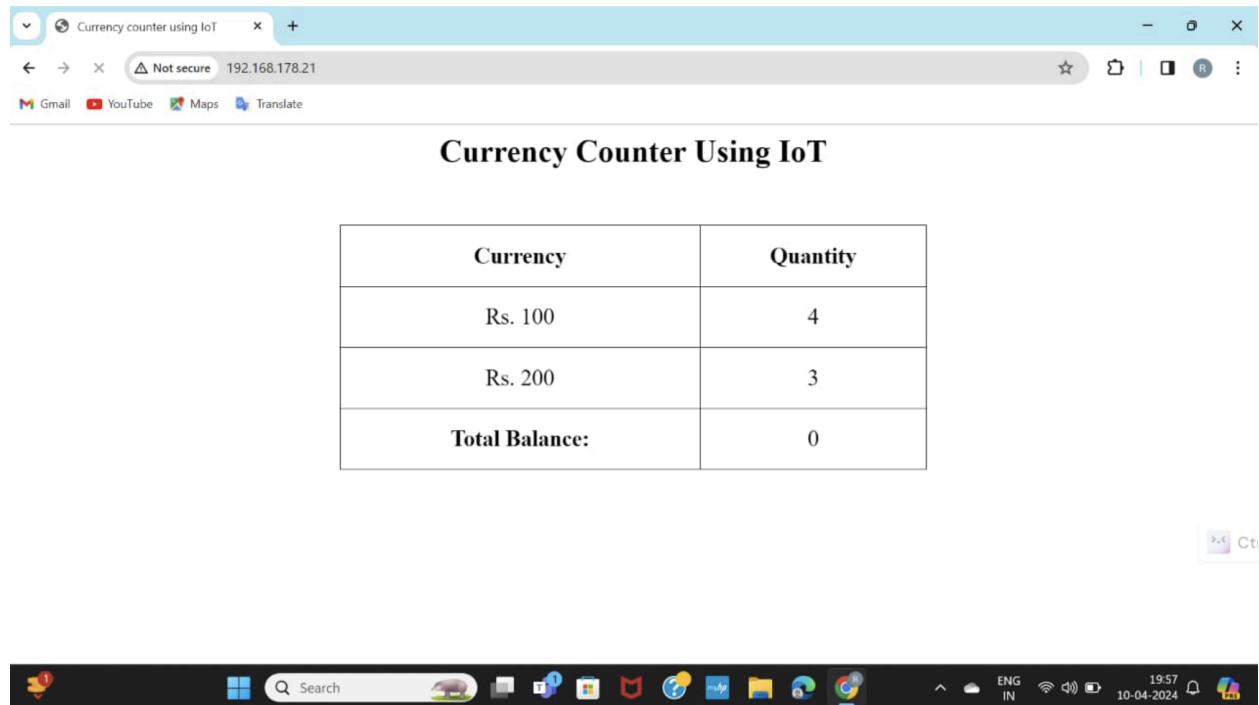
// Function to measure red frequency
int red() {
    digitalWrite(5, LOW);
    digitalWrite(15, LOW);
    frequency = pulseIn(34, LOW);
    return frequency;
}

// Function to measure blue frequency
int blue() {
    digitalWrite(5, HIGH);
    digitalWrite(15, HIGH);
    frequency = pulseIn(34, LOW);
    return frequency;
}

// Function to measure green frequency
int green() {
    digitalWrite(5, LOW);
    digitalWrite(15, HIGH);
    frequency = pulseIn(34, LOW);
    return frequency;
}
```

}

## Output:



Currency	Quantity
Rs. 100	4
Rs. 200	3
<b>Total Balance:</b>	0

**Fig 2:Describes the Snapshots of Smart Currency counting machine**