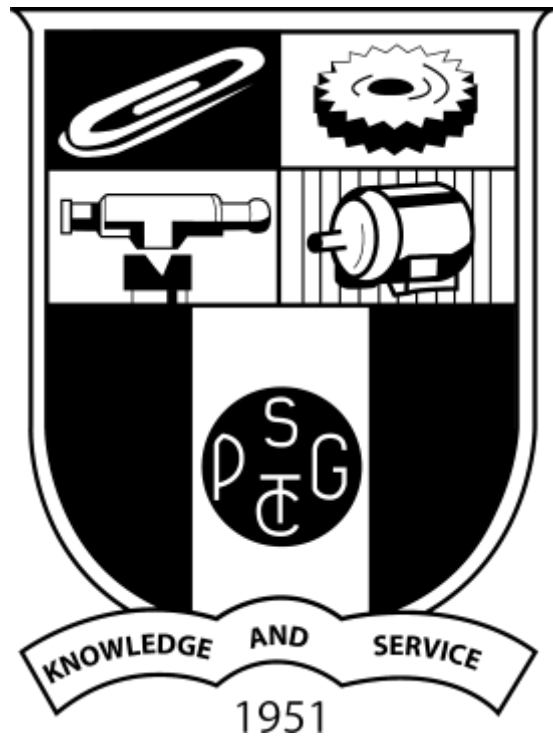


Embedded Systems

Report – Coin Counter



Team – 10

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Introduction:

A currency-counting machine is a machine that counts money-either stacks of banknotes or loose collections of coins. Counters may be purely mechanical or use electronic components. The machines typically provide a total count of all money, or count off specific batch sizes for wrapping and storage.

Currency counters are commonly used in vending machines to determine what amount of money has been deposited by customers.

In some modern automated teller machines, currency counters allow for cash deposits without envelopes, since they can identify which bills have been inserted instead of just how many. The user is given the chance to review the automatic counter's idea of the quantity and kinds of the inserted banknotes before the deposit is complete

The phrase coin counter may refer to a device which either sorts and counts coins at the same time, or only counts pre-sorted coins that are all the same size.

A typical counter of pre-sorted coins uses a bowl with flat spinning disc at the bottom to distribute coins around the bowl perimeter. An opening in the edge of the bowl is only wide enough to accept one coin at a time. Coins either pass through a light-beam counter, or are pushed through a spring-loaded cam that only accepts one coin at a time. Good standard for coin counter's counting speed is 300 coins per minute.

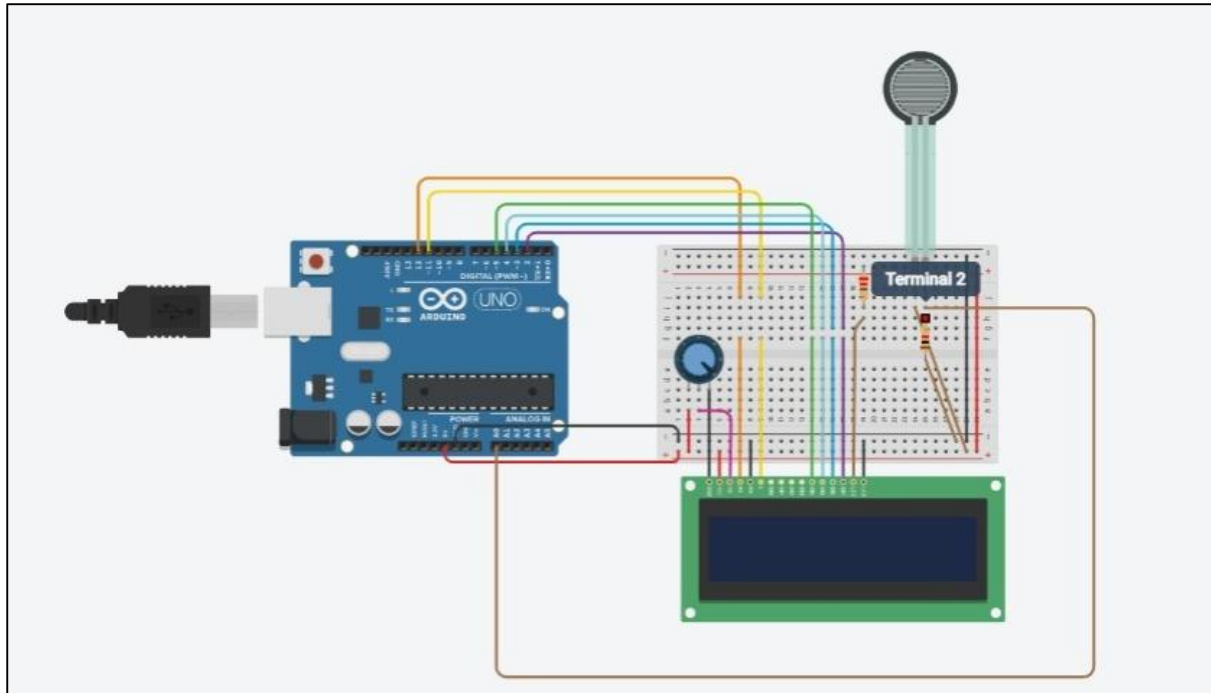
Problem Statement:

The problem statement is to create an Arduino counting machine using force sensors. This machine counts the coins using the weights of the different coins sensed by force sensors. The count of the different coins is shown in an android application. The app also displays the total amount calculated.

Components Required:

- Arduino UNO
- Force Sensors
- Breadboard
- Android Phone
- Connecting Wires
- Bluetooth module
- 10 ohm Resistors

Schematic Diagram:



Code:

```
#include <Wire.h>

void setup() {
  // set up the LCD's number of columns and rows:
  Serial.begin(9600);
}

int f1=0;
int c1=0,c2=0,c3=0;
void loop()
{
  float s1=analogRead(A0);
  if(s1>=30 && s1<=70 && f1==0){
    f1=1;
    c1++;
  }
  if(s1>=71 && s1<110 && f1==0){
    f1=1;
    c2++;
  }
  if(s1>=111 && s1<250 && f1==0){
```

```

    f1=1;
    c3++;
}
if(s1==0){
    f1=0;
}
/*Serial.print("Force : ");
Serial.println(s1);*/
Serial.println(c1);
Serial.print("|");
Serial.println(c2);
Serial.print("|");
Serial.println(c3);
Serial.print("|");
Serial.println(c3);
Serial.print(c1 + 2*c2 + 5*c3);
Serial.println("₹");
Serial.print("|");

delay(1000);
}

```

Challenges Faced:

- **Sensors :**

The sensors we actually intended to use didn't work out. At first we used IR sensors but it need an IR receiver. So we used ultra-sonic sensors to calculate the no of coins that falls from the different hole from the component interface.

Another problem with ultra-sonic sensors is that it doesn't take any metrics of the coin. So we moved to force sensor (used to measure amount of pressure applied).

- **Android application :**

There is no resource for Bluetooth data receiving in Android Studios. So we used a new environment (MIT Android Inventor). And it take some time to learn the new environment.

Contribution of Team Members:

- Dharma Dhurai V – Hardware implementation
- Harish – Android App
- Pradeep – Hardware implementation
- Srikanth – Arduino Code

References:

- To implement Arduino and other hardware Components
 - <https://create.arduino.cc/projecthub/rayatedarshan/coin-detector-and-amount-counter-0e65c9>
 - <https://www.electromaker.io/project/view/arduino-based-coin-sorting-and-counting-machine>
- To use Bluetooth for interaction between Arduino and Android App
 - <http://ai2.appinventor.mit.edu/>
 - <https://www.youtube.com/watch?v=BT4YihNXiYw>

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