

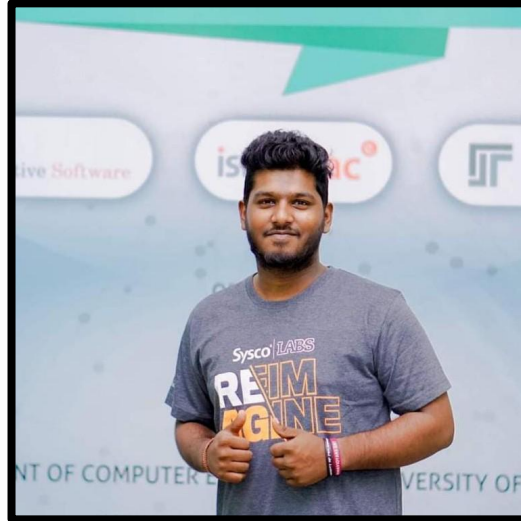
Smart Vending Machine

Milestone 5

Group 01



Suppysamy Bragadeeshan
E/16/055

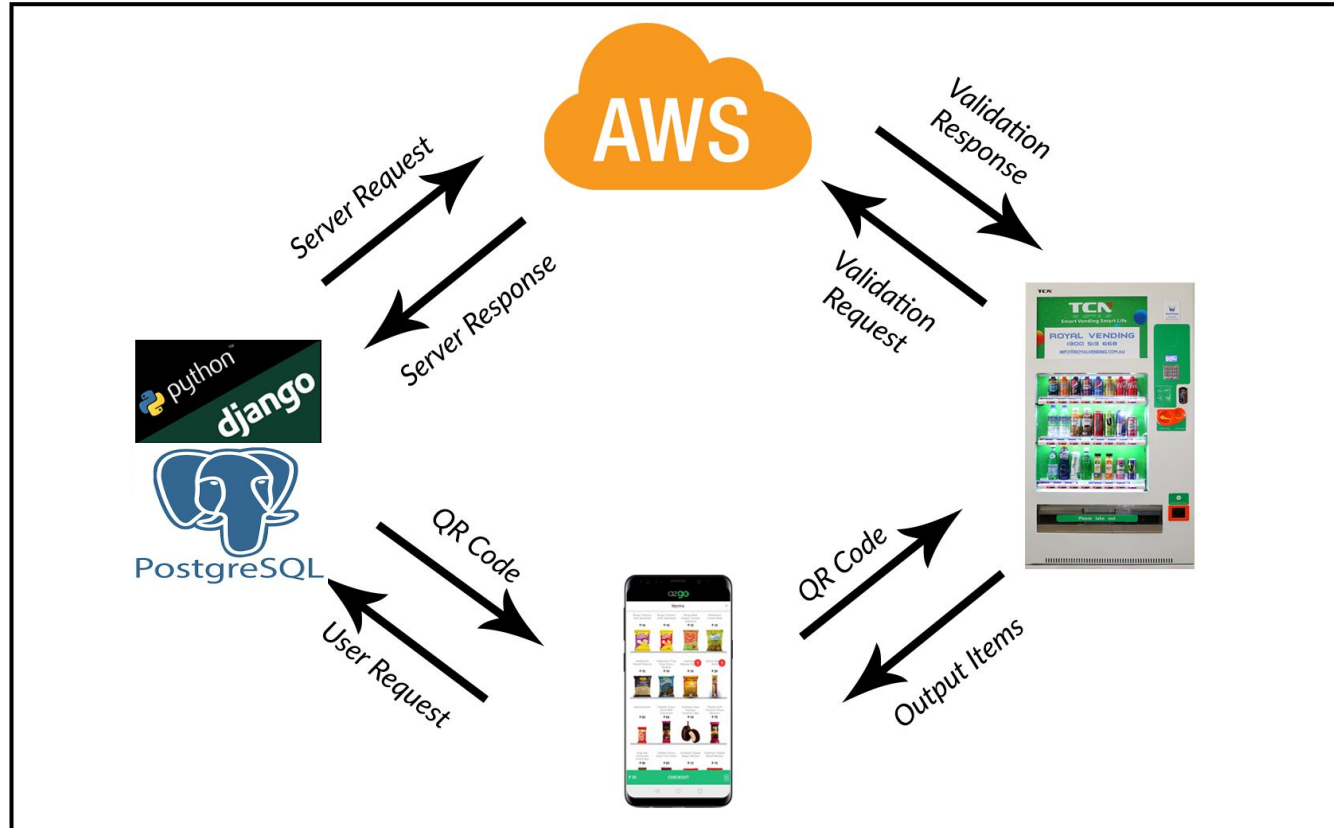


Selvaratnam Girishikan
E/16/115

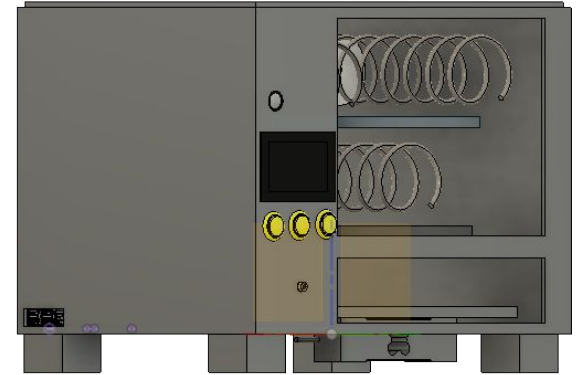
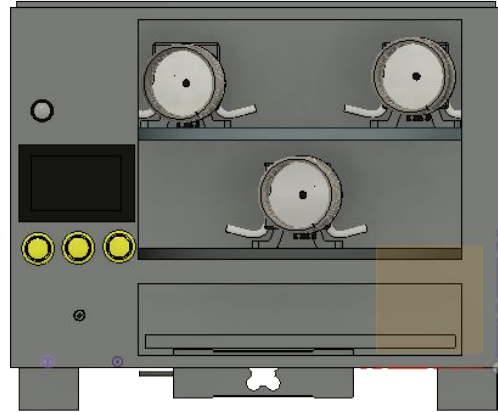


Vettrivel Harikaran
E/16/172

Solution Overview

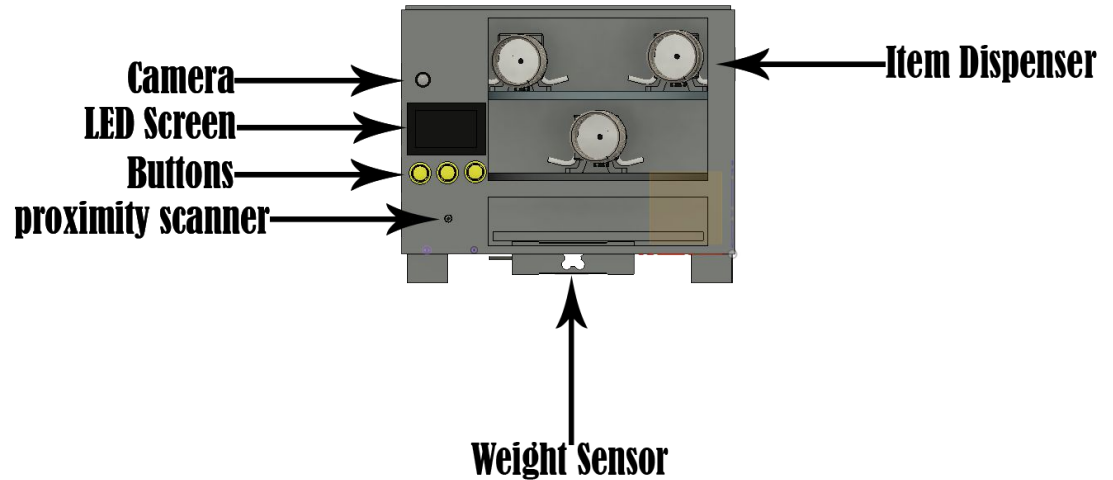


Overall Design



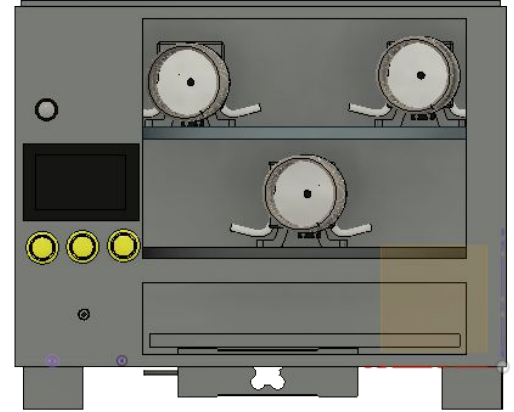
Device Design

- Full Closed Structure
- Rigid Wood body
- PIR controlled Power distribution
- LED Display



Device Design

- LED Display to interact
- Easy Set up Just have to interact with phone
- 24hrs service
- Easy Cancellation at any time
- LED strips inside to make sure the items are visible

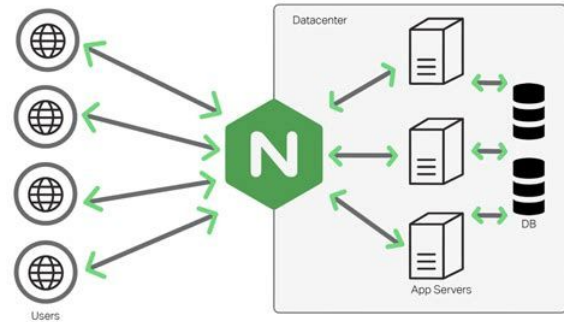


Cloud Server

- AWS EC2 Instance NGINX Server
- Gunicorn wsgi server
- Database is PostgreSQL
- Database is on Amazon RDS

Server

- Web Application Using Django
- Database is on PostgreSQL



Security

- Role Based access Control (`django.contrib.auth.decorators`)
- Hashed Passwords (`django.contrib.auth.forms`)
- CSRF token is used to keep the Content safe.(Cross site request forgery)
- For Secured Payment transaction Paypal is used
- Ratelimit. (`from ratelimit.decorators`)



**Django
Security Check**

Scalability

Multiple user access to the server

Pagination for the products

PostgreSQL can Easily Manage excess data



Reliability

Email Authentication

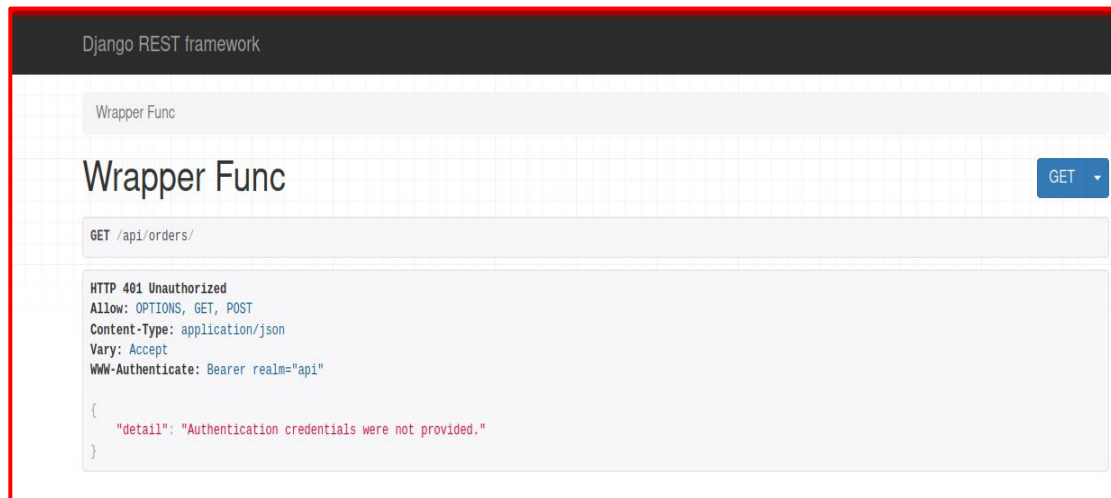
Reset forgot Password

Paypal Payments

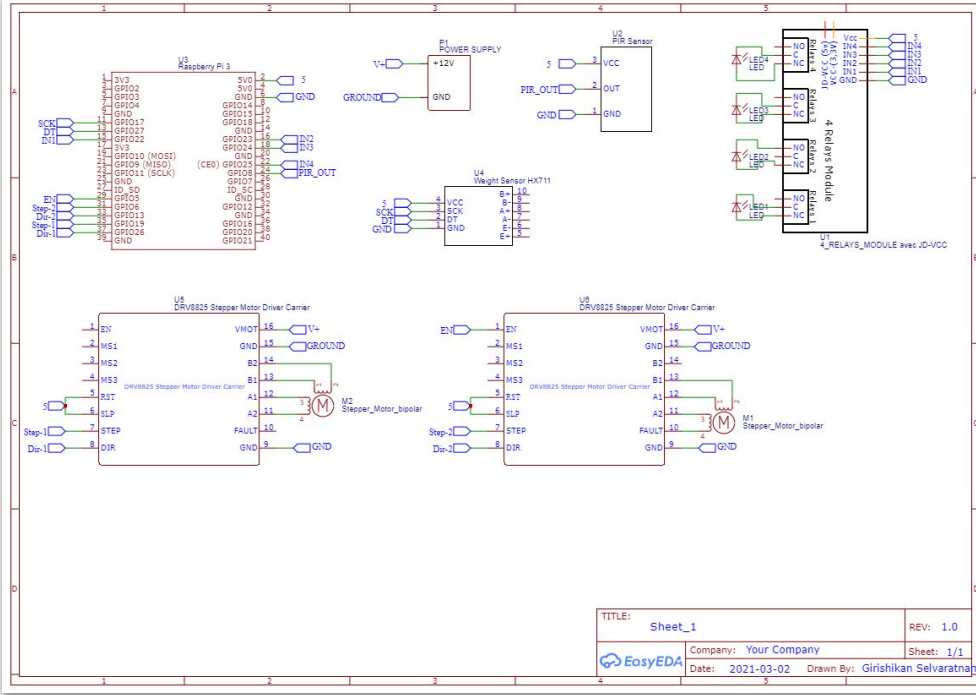


Rest API

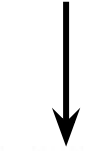
- JWT(json web token) authentication
- CRUD operations available
- With Rate limit



HardWare Design



Stepper Motor



Weight Sensor



SD Card

Camera

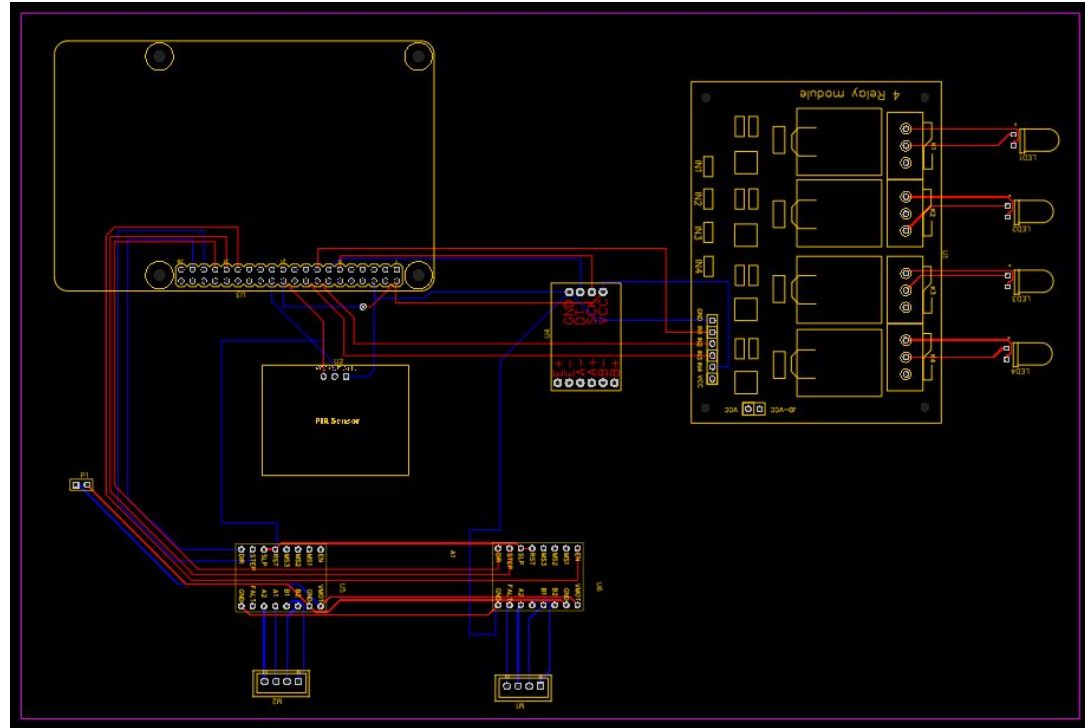
Relay

PIR Sensor

PCB Design

Double Side printing

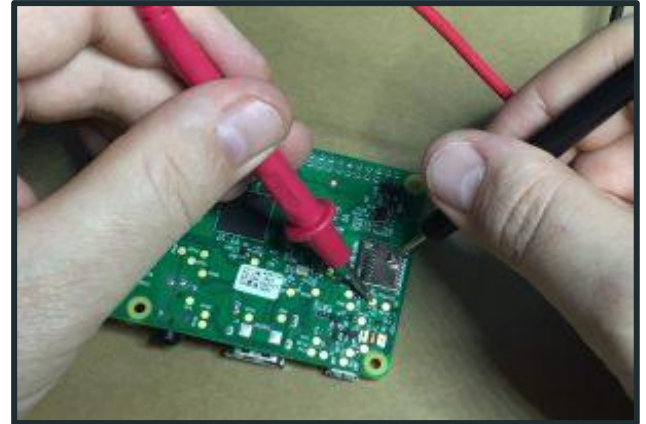
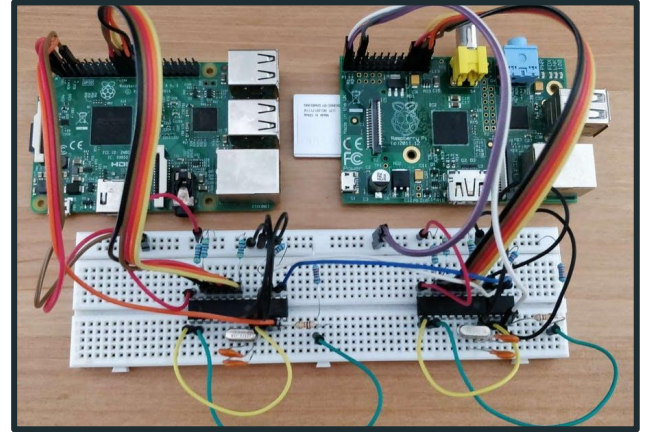
Use PCB Printing



Hardware Testing

Testing For Raspberry Pi3

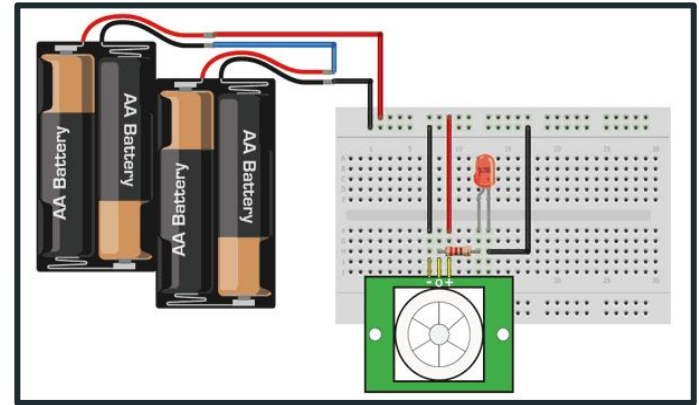
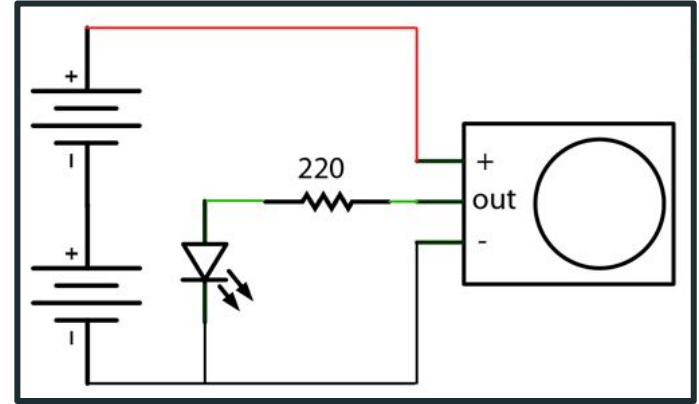
- Check the Raspberry Pi's Red and Green LED Lights.
- Check the power cable, operating system and HDMI cable
- Check the GPIO pins



Hardware Testing

Testing For PIR Sensor

- Normal Testing
- Changing sensitivity
- Changing Pulse Time and Timeout Length



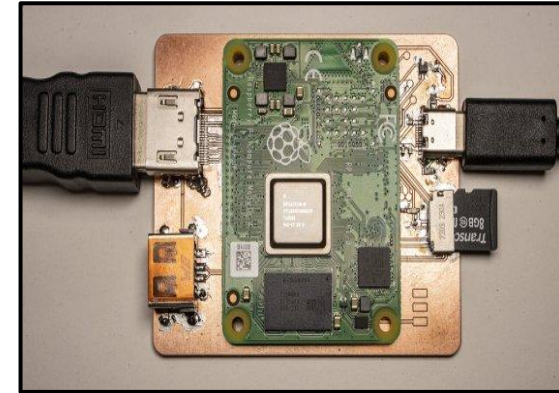
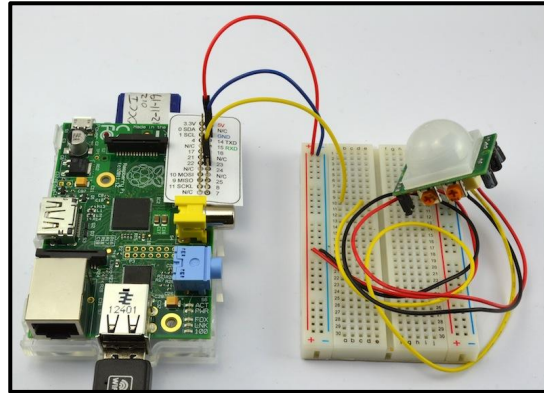
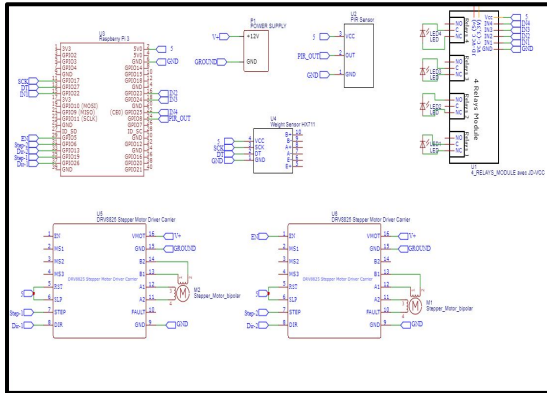
Hardware design Aspects

- **Scalability**
 - Multiple Devices Single server
 -
- **Reliability**
 - Weight Sensor to make sure the dispensing of an item
 - Stepper motor to make sure the Quantity of the item
- **Security**
 - 6 pin number security to the door of the vending machine
 - Rigid wooden body(demonstration)/real vending machine is metal body



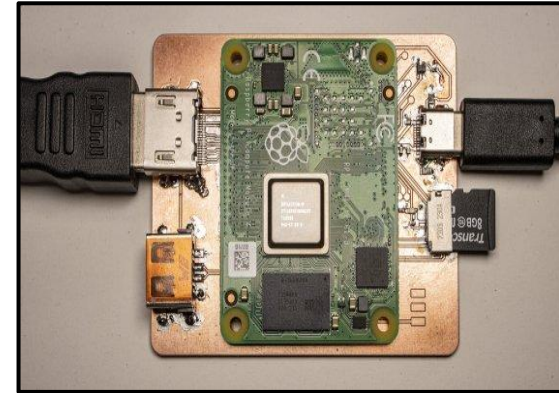
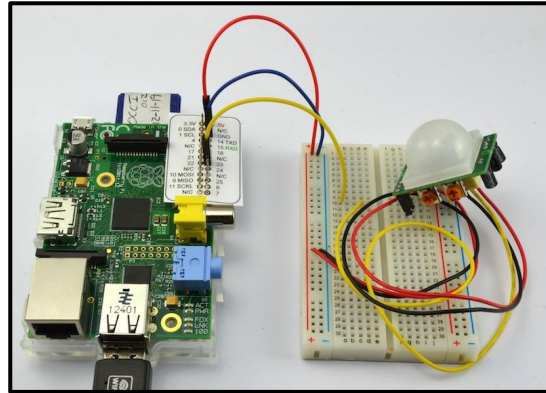
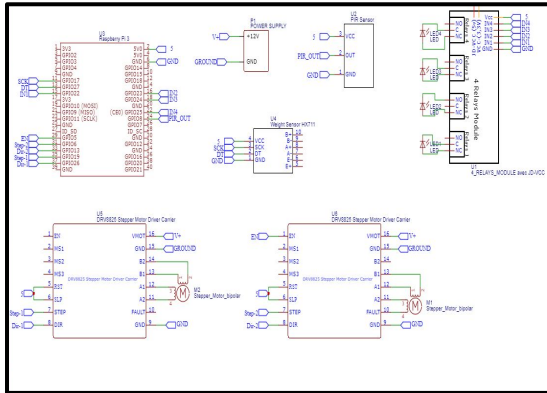
Hardware Testing

Before Testing We have to check the circuit correctly working or not by with breadboards.



Hardware Testing

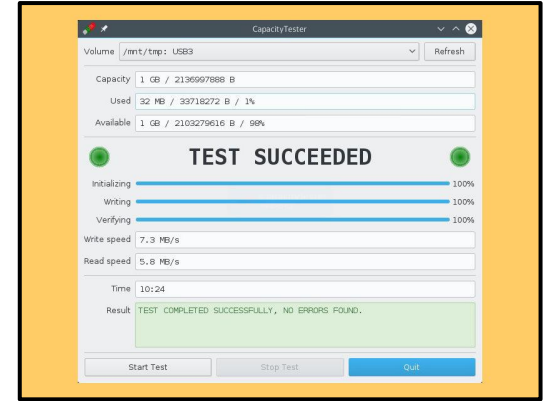
Before Testing We have to check the circuit correctly working or not by with breadboards.



Hardware Testing

SD Card Testing

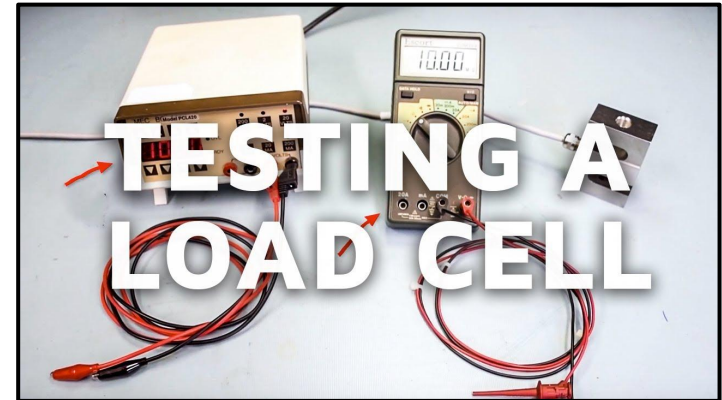
- Need to Checks to detect missing chips
- catastrophic failures
- problems with the control bus wiring.
- Test the speed



Weight Sensor Testing

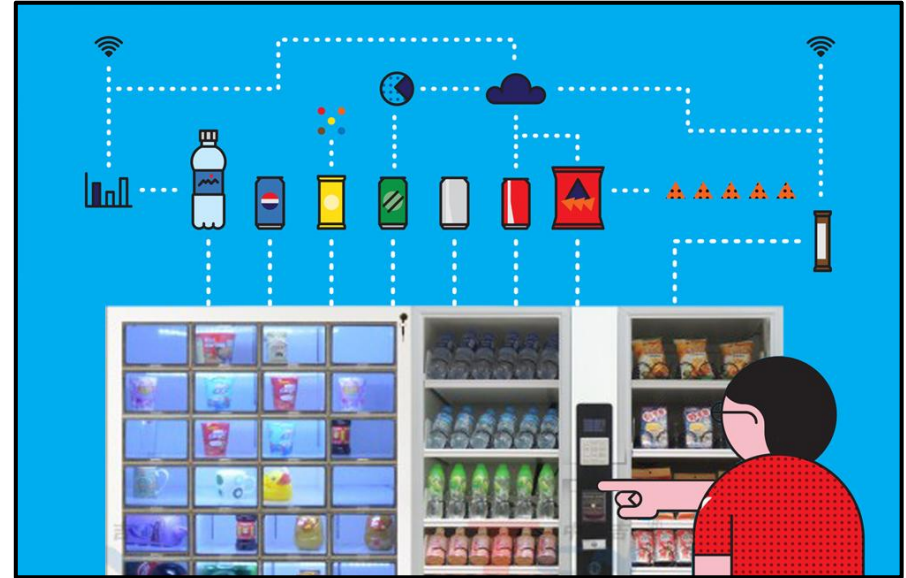
Measure the input and output weights and compare With manufacturer certificate. And want to check These Measurements-

- Zero balance
- Insulation resistance
- Bridge integrity



Hardware Testing

- **Performance Testing**
 - ❖ Server side
 - ❖ Client Side
- **Embedded System Testing**
 - ❖ System Unit Testing
 - ❖ System Integration Testing
 - ❖ System Validation Testing



Q & A