



ReVendo

Manual

Made by ReVendo Team

Bachelor of Science in Computer Science Students

UNIVERSITY OF CALOOCAN CITY - SOUTH CAMPUS

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WHAT IS REVENDO?

ReVendo, a revolutionary reverse vending machine designed to combat plastic bottle pollution. Our state-of-the-art machine enables users to easily exchange plastic bottles for valuable reward points, encouraging eco-conscious behavior while simultaneously reducing plastic waste in the community. With ReVendo, not only do you contribute to a cleaner environment, but you also unlock exciting perks within your community by accumulating points. Moreover, our innovative charging station allows you to convert these points into charging time, the charging station ensures sustainable connectivity through both solar power and conventional electricity.

Join us in making a positive impact with ReVendo today!

FEATURING OUR HARDWARE



HARDWARE REQUIREMENTS

These are the list of hardware components to build reverse vending machine, charging station and register rfid card scanner:

- Raspberry Pi 4 Model B 4GB with 32GB micro sd card.
- Raspberry Pi Camera V2.
- HX-711 load cell.
- 35Kg Servo Motor.
- MFRC522 RFID (3 pieces).
- NodeMCU ESP8266 (4 pieces).
- Ultrasonic Sensor (2 pieces).
- Liquid Crystal Display I2C.
- Buttons with Cap (2 pieces).
- Relay Single Module (2 pieces).
- Buzzer (3 pieces).
- PCB board.
- Extension cables (3 pieces).
- 3 in 1 USB Cable (micro, type c, iPhone).
- Micro-type USB cable (4 pieces).
- Breadboard.
- Jumper wires.
- 500W Inverter.
- 50W Solar panel.
- 12AH Solar Charge Controller.
- 12V 12AH Acid Lead Battery.
- Wall Outlet.
- Light Bulb (White).
- Automatic Transfer Switch.

To successfully run web application these are hardware requirements:

- OS: Windows 10 or above
- Processor: Intel Core i3 or AMD, 1.2 GHz dual-core or higher.
- RAM: 4 GB or higher.
- Internet: Stable internet connection (5 Mbps or higher) Wi-Fi, Ethernet, or mobile data

To successfully install the mobile application these are the hardware requirements:

- OS: Android 9 or Pie (API 28) higher
- Processor: Qualcomm Snapdragon 855 or higher
- Internet: Stable internet connection (5 Mbps or higher) Wi-Fi, Ethernet, or mobile data

To successfully run application in raspberry pi these are the hardware requirements:

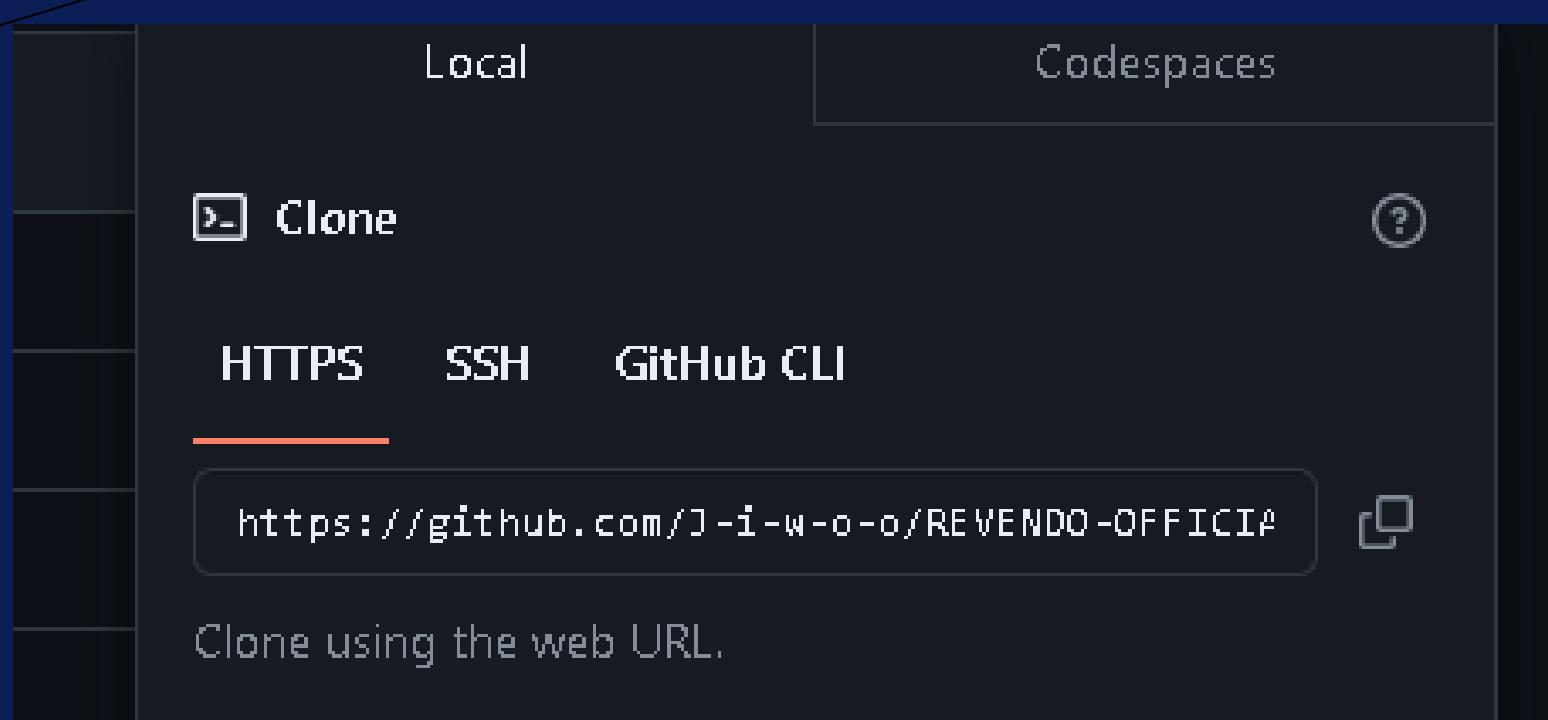
- OS: Raspberry Pi OS - System: 64-bit, kernel version 6.6, Debian version: 12 (bookworm)
- RAM: 4GB or 8GB
- Storage: 32GB micro SD card
- Internet: Stable internet connection (5 Mbps or higher) Wi-Fi, Ethernet, or mobile data

SOFTWARE REQUIREMENTS

These are the following software requirements in order to run the web application, and the hardware components.

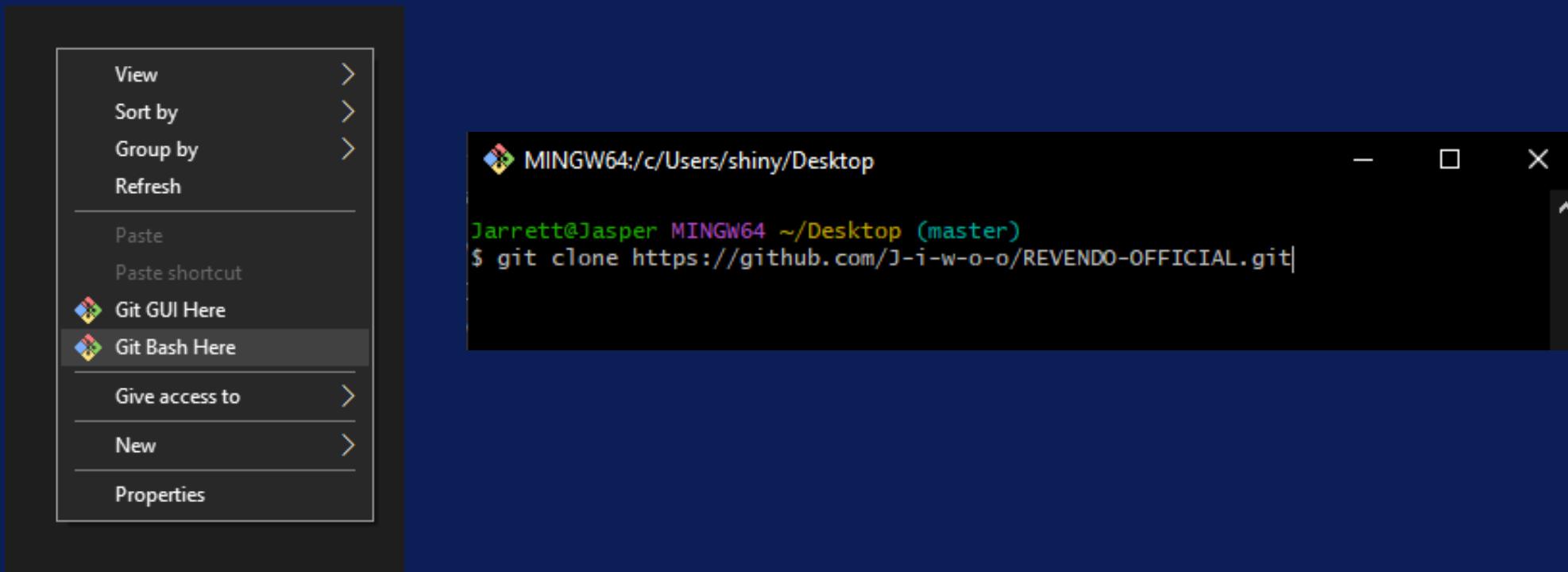
- Python Version – Python 3.12.1
- YOLOv8
- Node JS Version – v20.10.0
- XAMPP – ApacheFriends XAMPP Version 8.2.4
- Git – 2.41.0.windows.1
- opencv_python 4.8.1.78
- numpy 1.26.1
- pandas 2.1.1
- scipy 1.11.3
- request 2.31.0
- HX711 1.0.
- gpiozero 2.0
- PIGPIO 1.78
- PILLOW 10.1.0
- PIP 23.0.1
- TORCH 2.0.1
- TORCHVISION 0.15.2
- ULTRALYTICS 8.0.200
- SEABORD 0.1.3.0
- RPI GPIO 0.7.1

HOW TO CLONE REVENDO SYSTEM?



Step 1

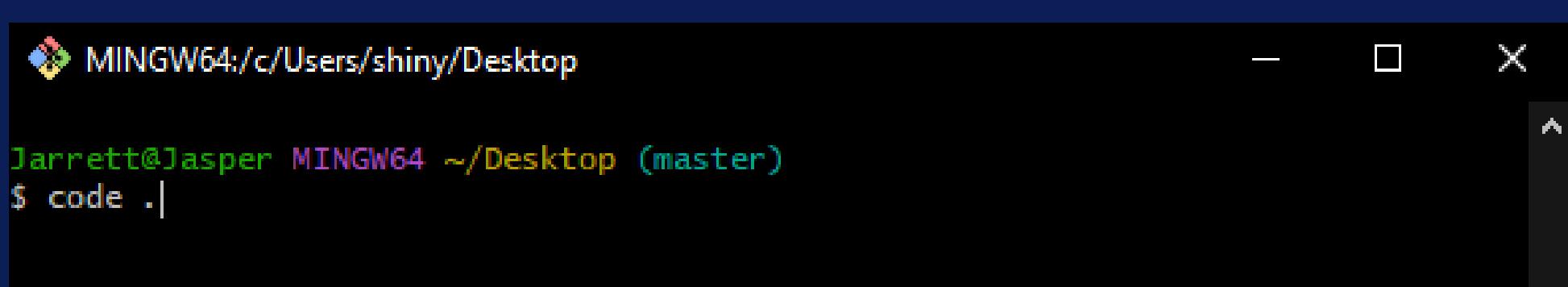
Go to repository "<https://github.com/J-i-w-o-o/REVENDO-OFFICIAL>" and copy the link



Step 2

On File Explorer > Desktop directory, open **GitBash** by right click.
Type "git clone https://github.com/J-i-w-o-o/REVENDO-OFFICIAL.git" to clone the project in local computer.

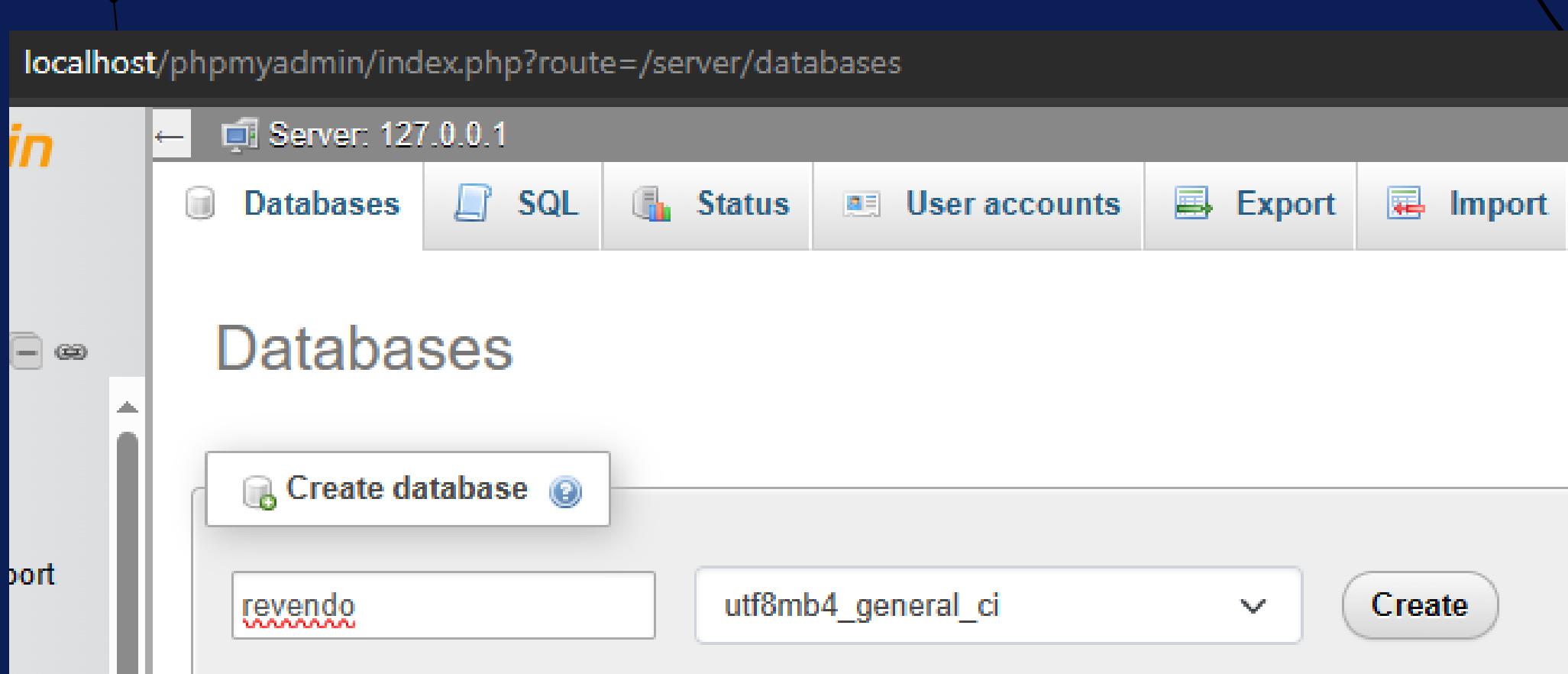
Make sure you install **Git** to clone repository visit here "<https://git-scm.com/downloads>"



Step 3

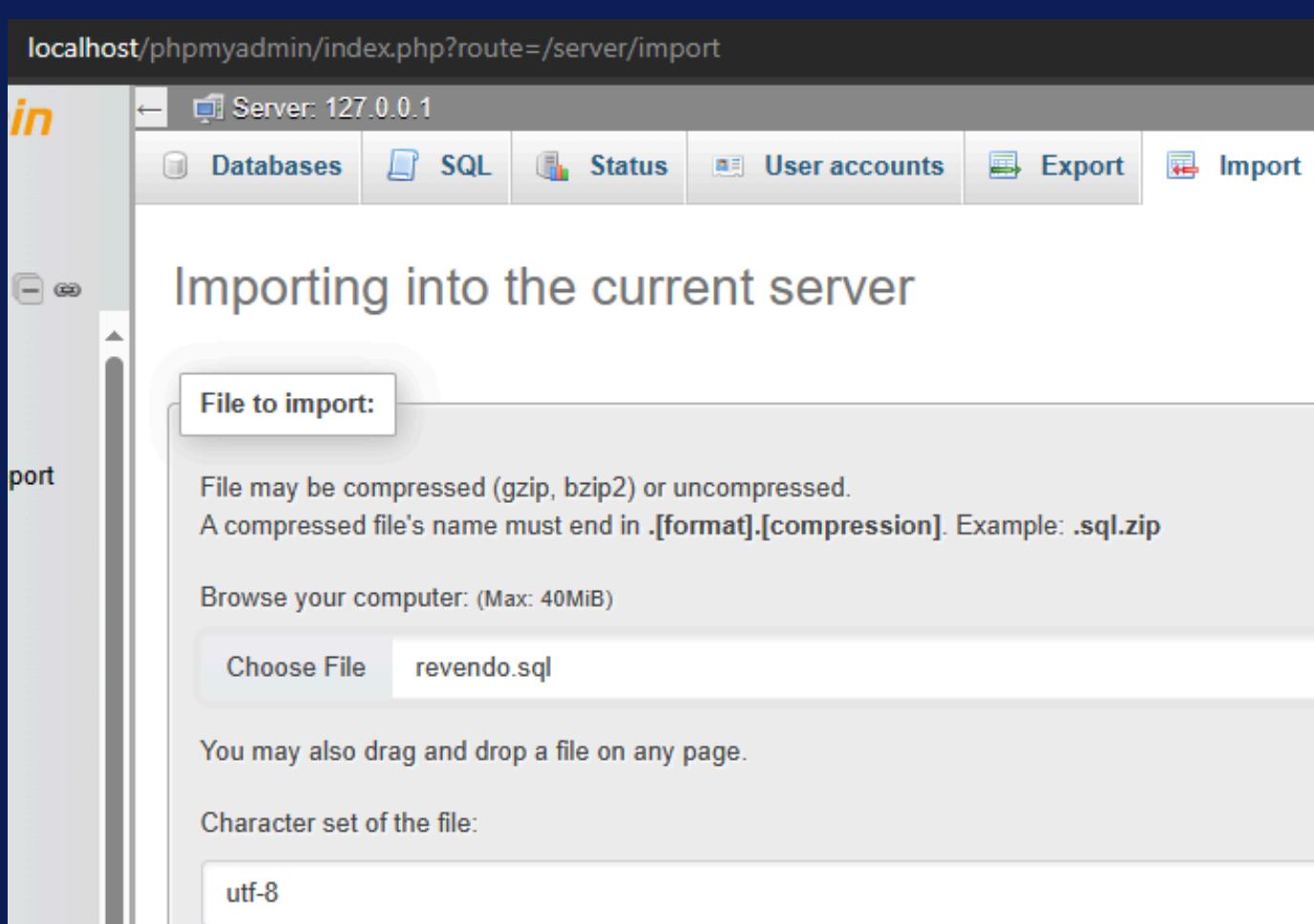
Once clone done, type "code ." or open the folder on VS Code to open the project on VS Code.

HOW TO IMPORT THE DATABASE?



Step 1

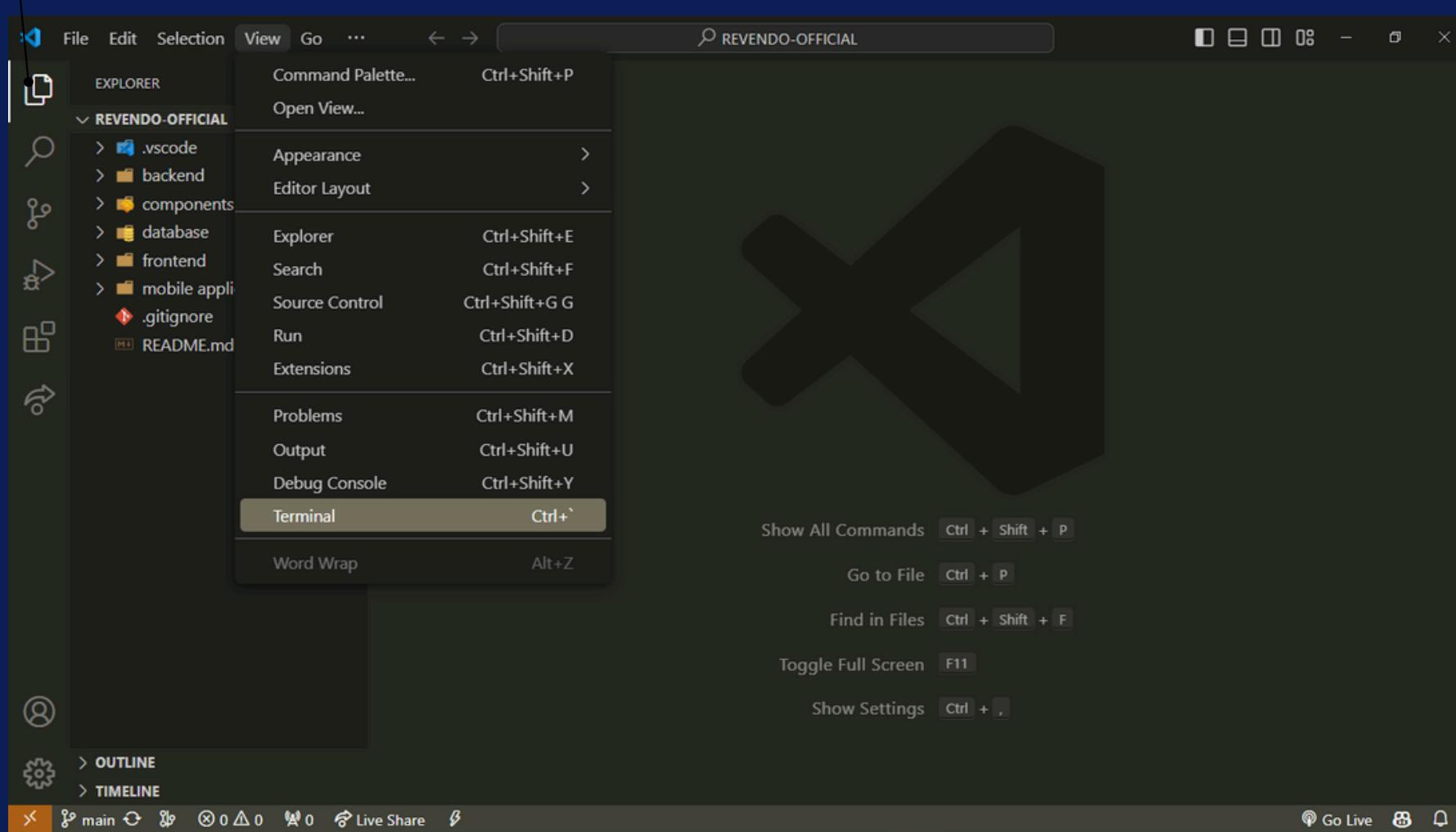
Create database name “**revendo**” then click create button



Step 2

Import the database named “**revendo.sql**” in **localhost/phpmyadmin**. The database is found in the **database** folder in ReVendo Project you just clone or downloaded.

HOW TO INSTALL AND RUN THE REVENDO SYSTEM?



Step 1

Open terminal on VSCODE by going to menu bar
click View > Terminal or by Ctrl + `

To run ReVendo Website (Landing Page)

A screenshot of the VSCode terminal tab. The tab title is "TERMINAL". The terminal window displays two lines of command-line text:
PS C:\Users\shiny\Desktop\4th Year - 1st Sem\REVENDO-OFFICIAL> cd frontend/client
PS C:\Users\shiny\Desktop\4th Year - 1st Sem\REVENDO-OFFICIAL\frontend\client> npm run dev

Step 2

Install node modules for frontend.

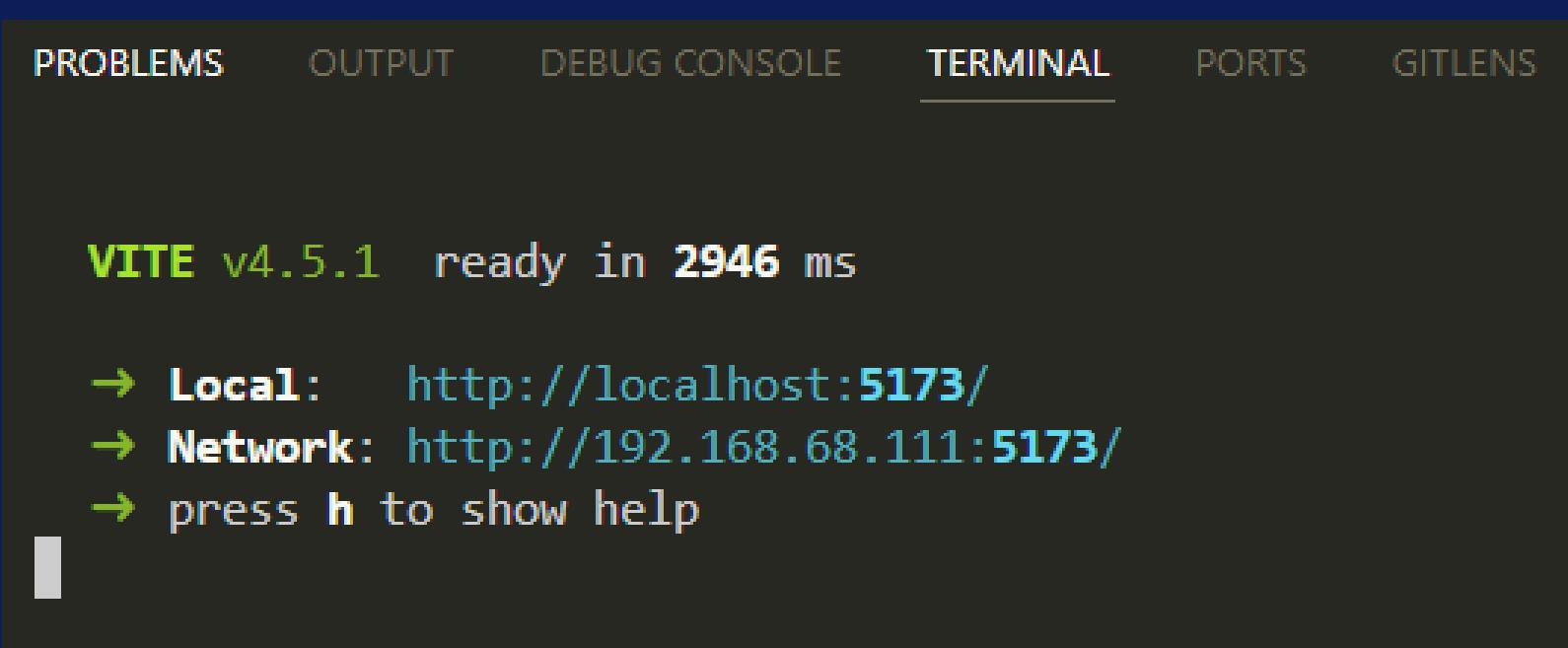
For frontend - landing page

on terminal type
cd frontend/client

npm install - make sure Node JS is installed

npm run dev

Visit: <https://nodejs.org/en> to install Node.js

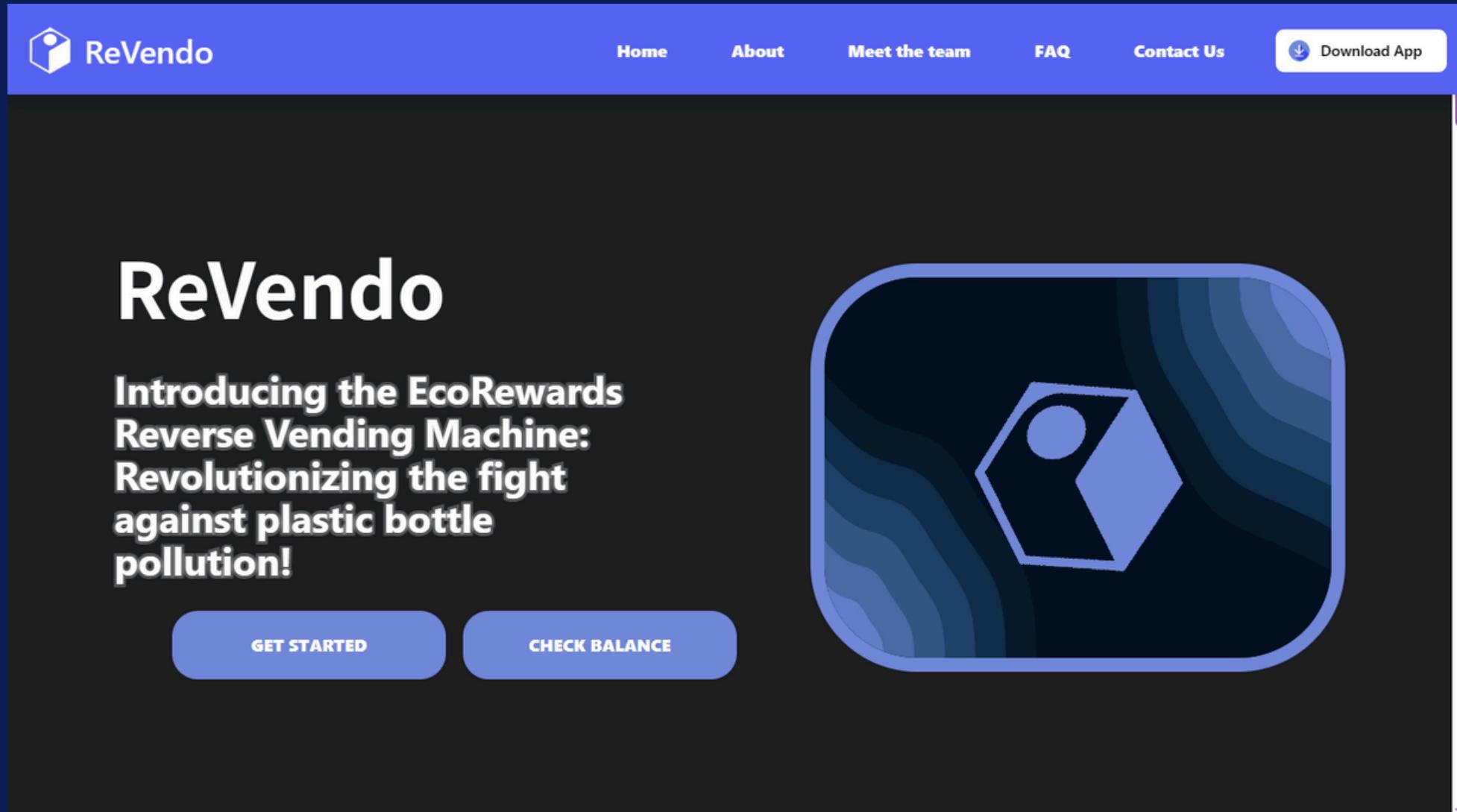


A screenshot of a terminal window titled "TERMINAL". The window displays the following text:

```
VITE v4.5.1 ready in 2946 ms
→ Local: http://localhost:5173/
→ Network: http://192.168.68.111:5173/
→ press h to show help
```

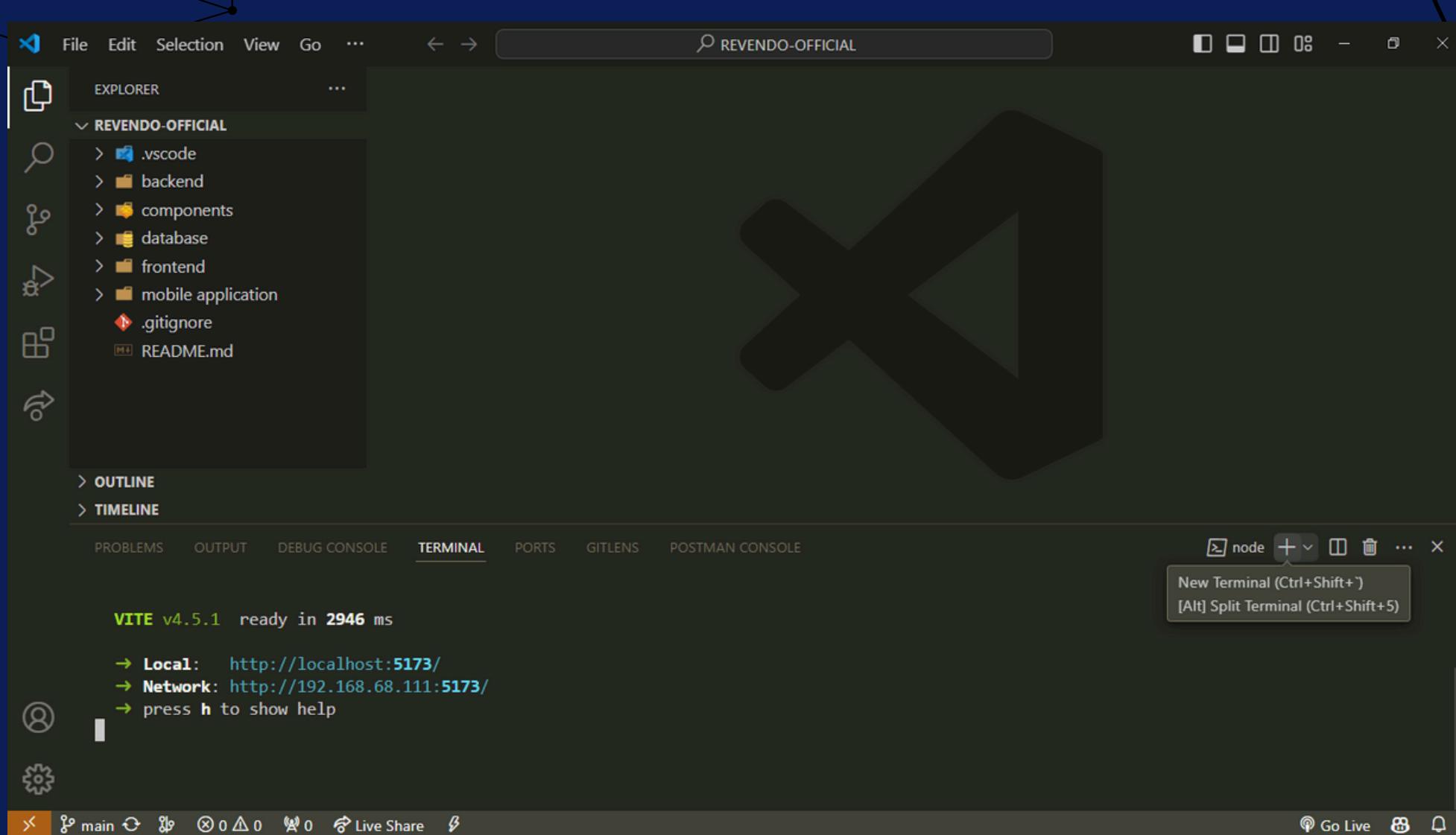
Step 3
Click <http://localhost:5137/> to run the landing page

You can visit our hosted landing page on this link:
<https://revendo.ucc-bscs.com/>



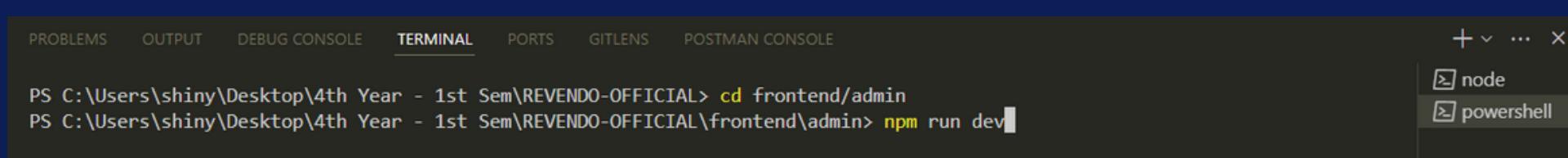
You are now successfully runs the landing page of ReVendo

To run ReVendo System (Admin Page)



Step 1

Open new terminal on VS CODE by clicking (+) icon on VSCode terminal or by Ctrl + Shift + `



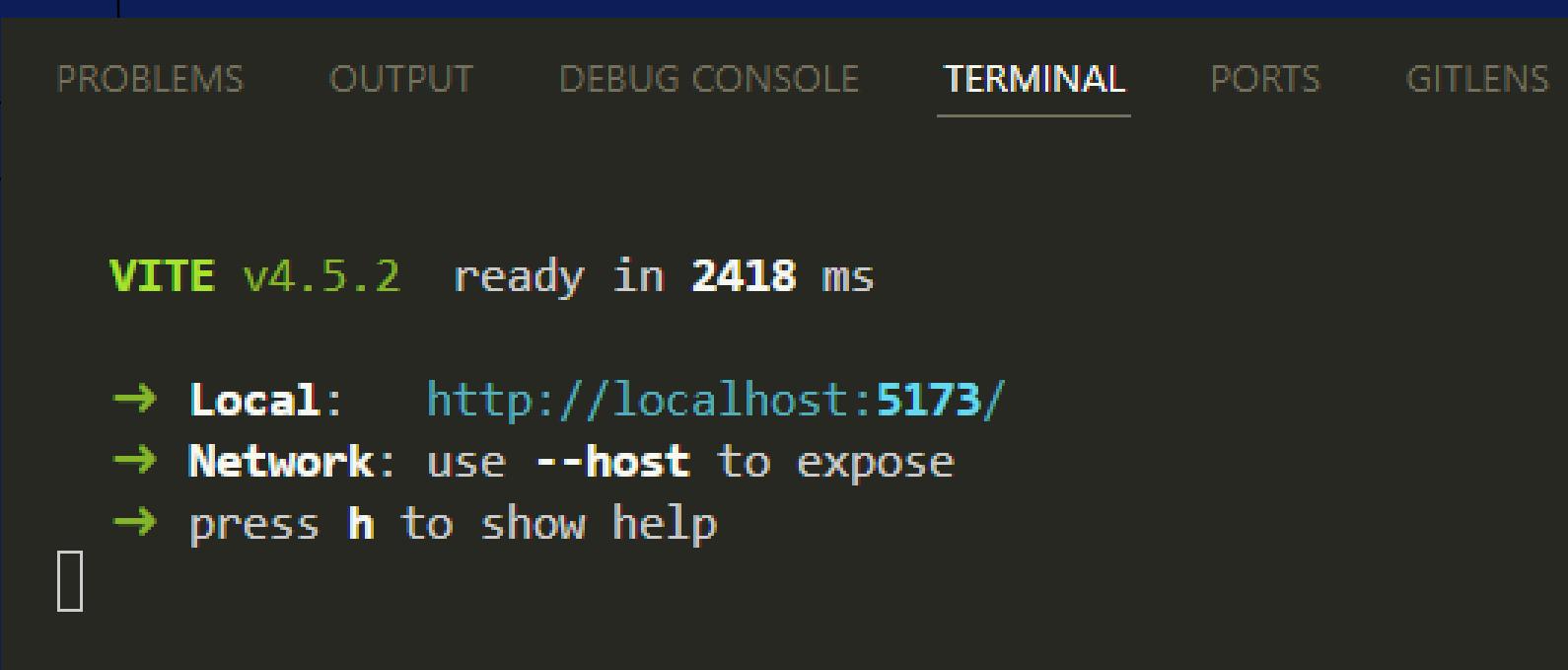
Step 2

Install node modules for frontend admin page.
For frontend - admin page

on terminal type
cd frontend/admin

npm install - make sure Node JS is installed
npm run dev

Visit: <https://nodejs.org/en> to install Node.js



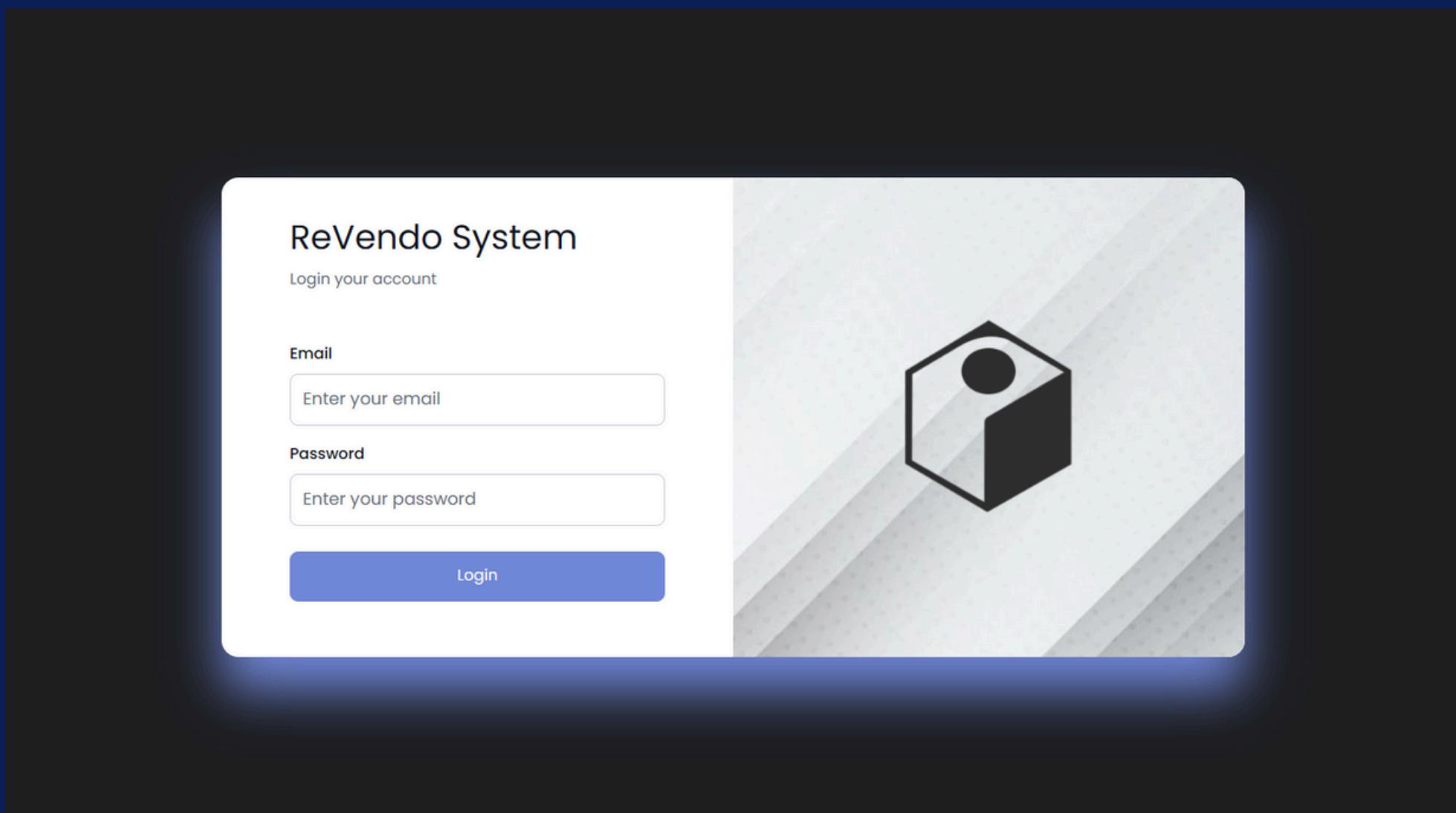
```
VITE v4.5.2 ready in 2418 ms

→ Local: http://localhost:5173/
→ Network: use --host to expose
→ press h to show help
```

Step 3

Click <http://localhost:5137/> to run the admin page

You can visit our hosted admin page on this link:
<https://admin-revendo.ucc-bscs.com/>



You are now successfully runs the landing page of ReVendo

To run backend server

Step 1

Open new terminal on VS CODE by clicking (+) icon on VSCode terminal or by Ctrl + Shift + `

Step 2

Install node modules for backend.

For frontend - admin page

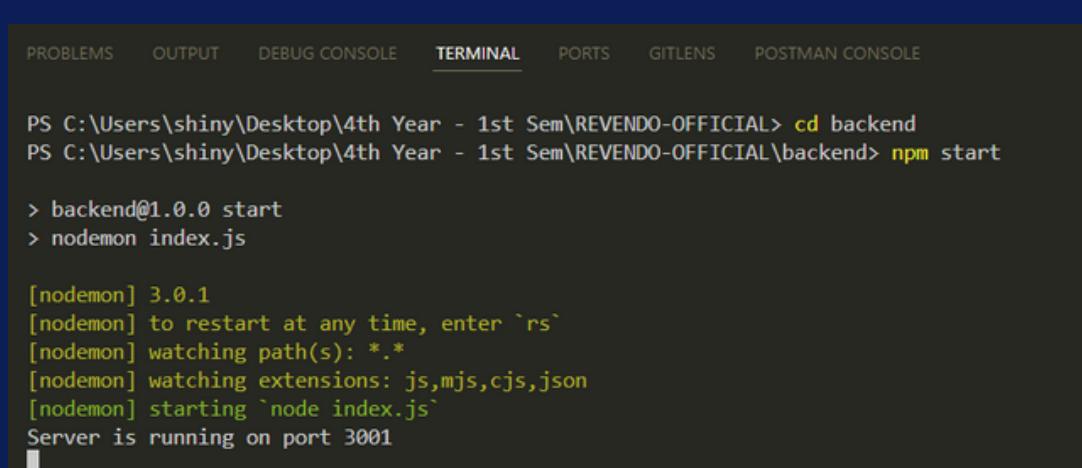
on terminal type

cd backend

npm install - make sure Node JS is installed

npm start

Visit: <https://nodejs.org/en> to install Node.js



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS POSTMAN CONSOLE

PS C:\Users\shiny\Desktop\4th Year - 1st Sem\REVENDO-OFFICIAL> cd backend
PS C:\Users\shiny\Desktop\4th Year - 1st Sem\REVENDO-OFFICIAL\backend> npm start

> backend@1.0.0 start
> nodemon index.js

[nodemon] 3.0.1
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): ***!
[nodemon] watching extensions: js,mjs,cjs,json
[nodemon] starting `node index.js`
Server is running on port 3001
```

Congrats you are now all setup for landing page and admin page locally

IMPORTANT NOTE

You can visit hosted landing page and admin page here:

Admin Page - <https://admin-revendo.ucc-bscs.com>

Landing Page - <https://revendo.ucc-bscs.com>

AT FIRST RUN ON OUR DEPLOYED WEBSITE, MOBILE, AND HARDWARE, IT HAS SLOW RESPONSE TIME AT FIRST DUE TO OUR SERVER IS FREE. ONCE IT RUN TIME SUCCESSFULLY IT WILL RUN SMOOTHLY ON THE SECOND REQUEST.

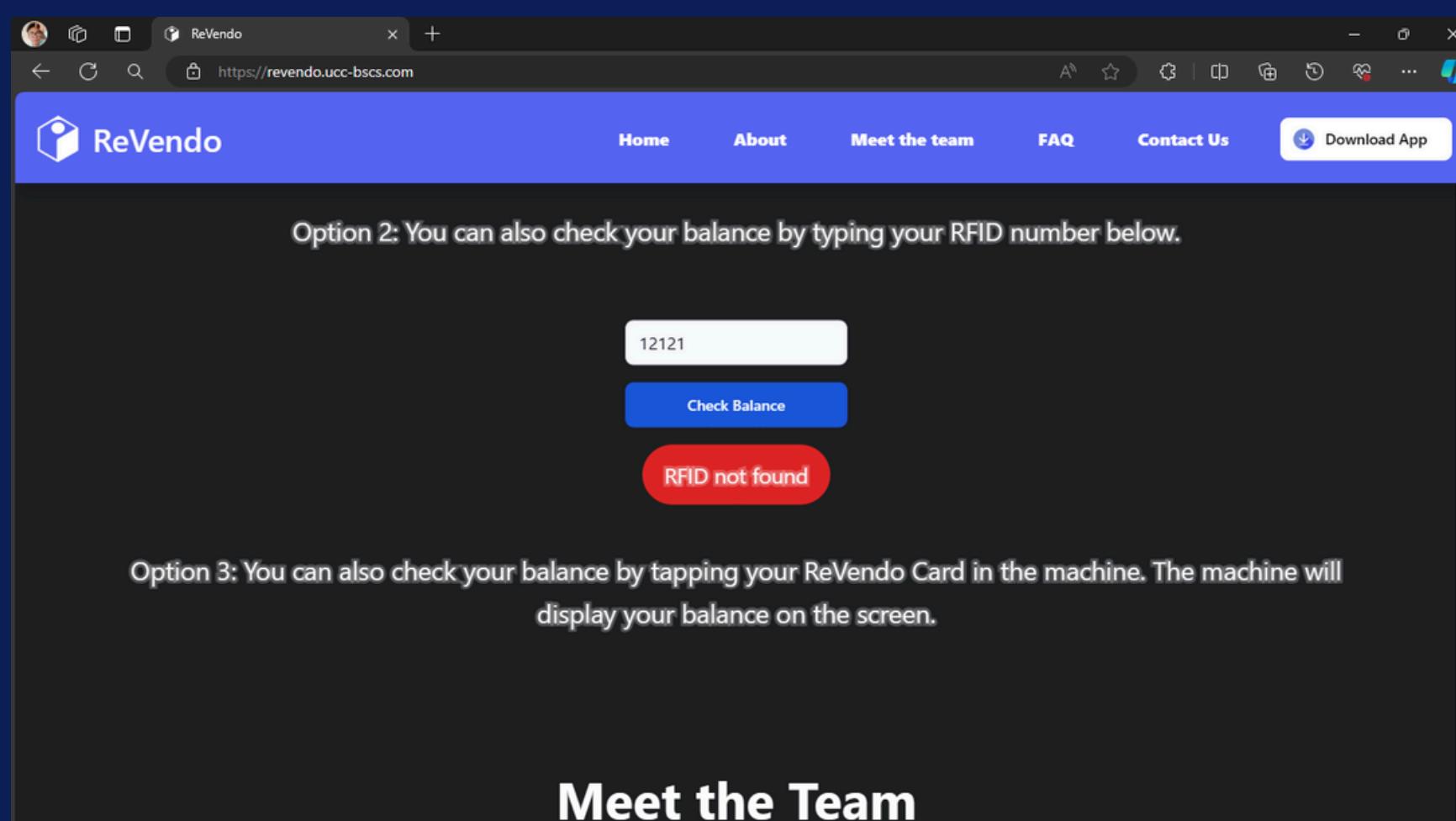
THIS IS OUR BACKEND SERVER WE USED

<https://render.com>

Example : <https://revendo-backend-main.onrender.com/api/account>

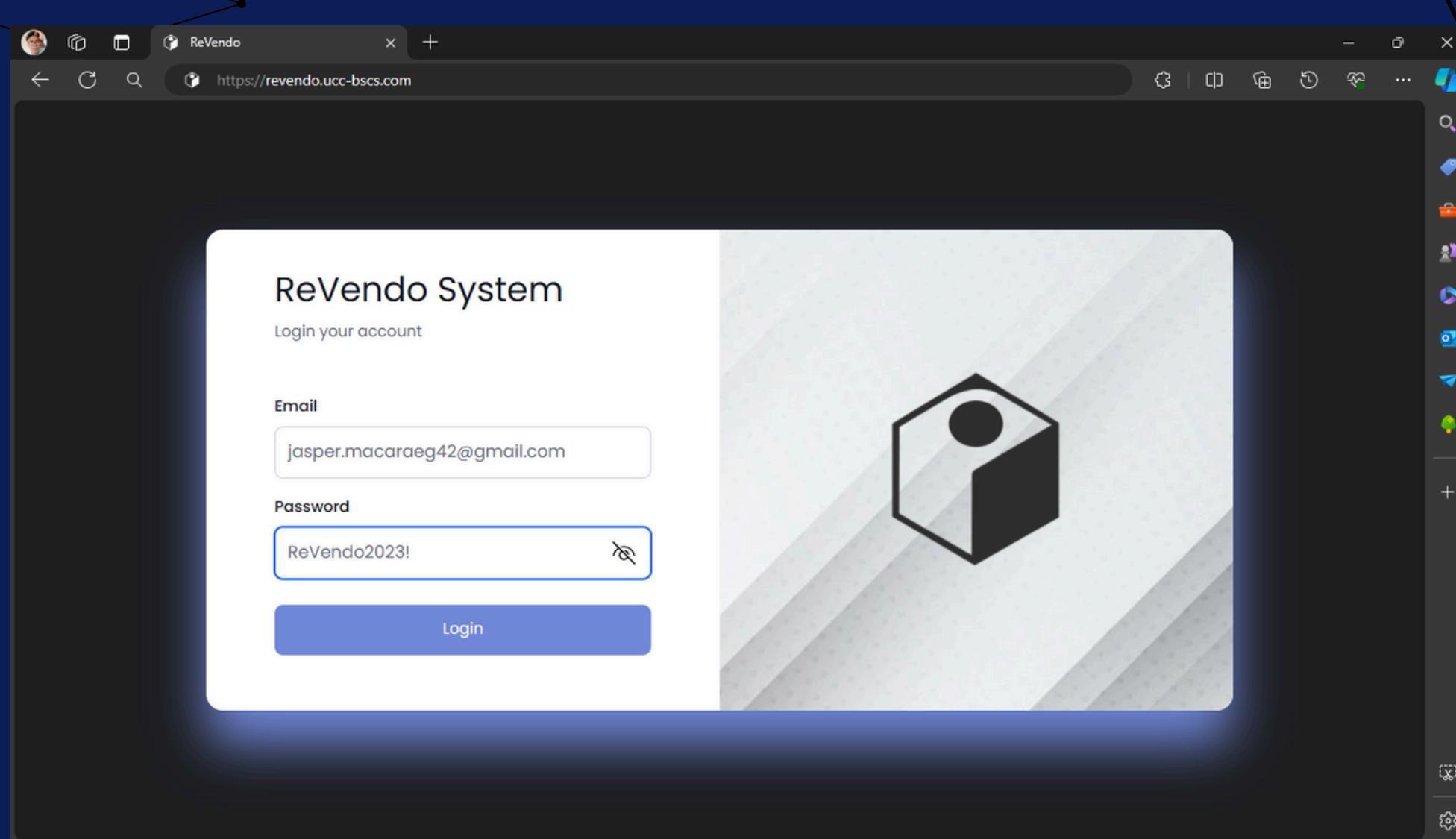
TO MAKE IT RUN SMOOTHLY

1. Go to our website <https://revendo.ucc-bscs.com>
2. Input any value from the check balance section



3. After 2-3 minutes this it will run smoothly the request of api calls

HOW TO USE REVENDO SYSTEM?



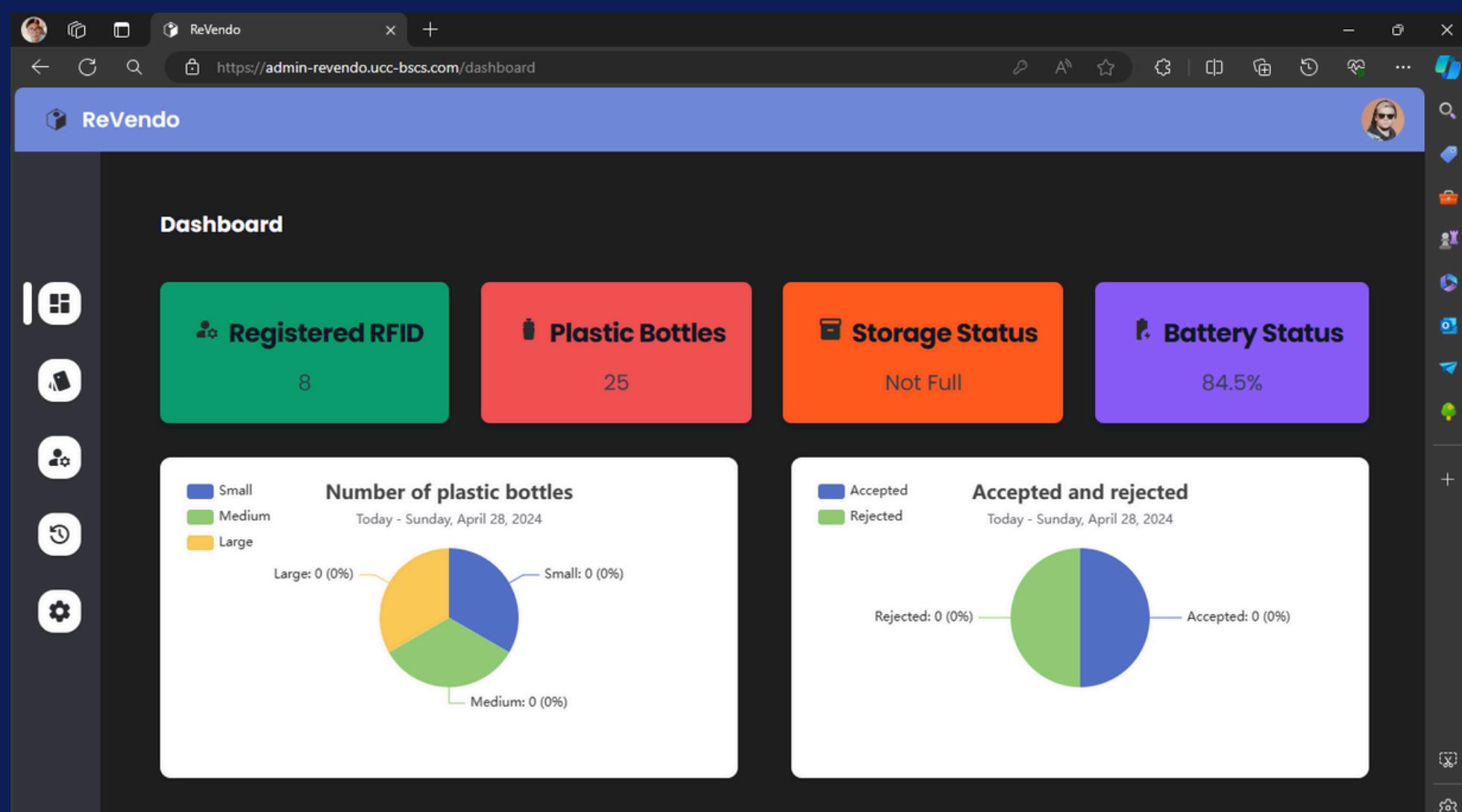
Step 1

Visit: https://admin-revendo.ucc-bscs.com/

Once you are on the “ReVendo System” page.
input these credentials to run admin.

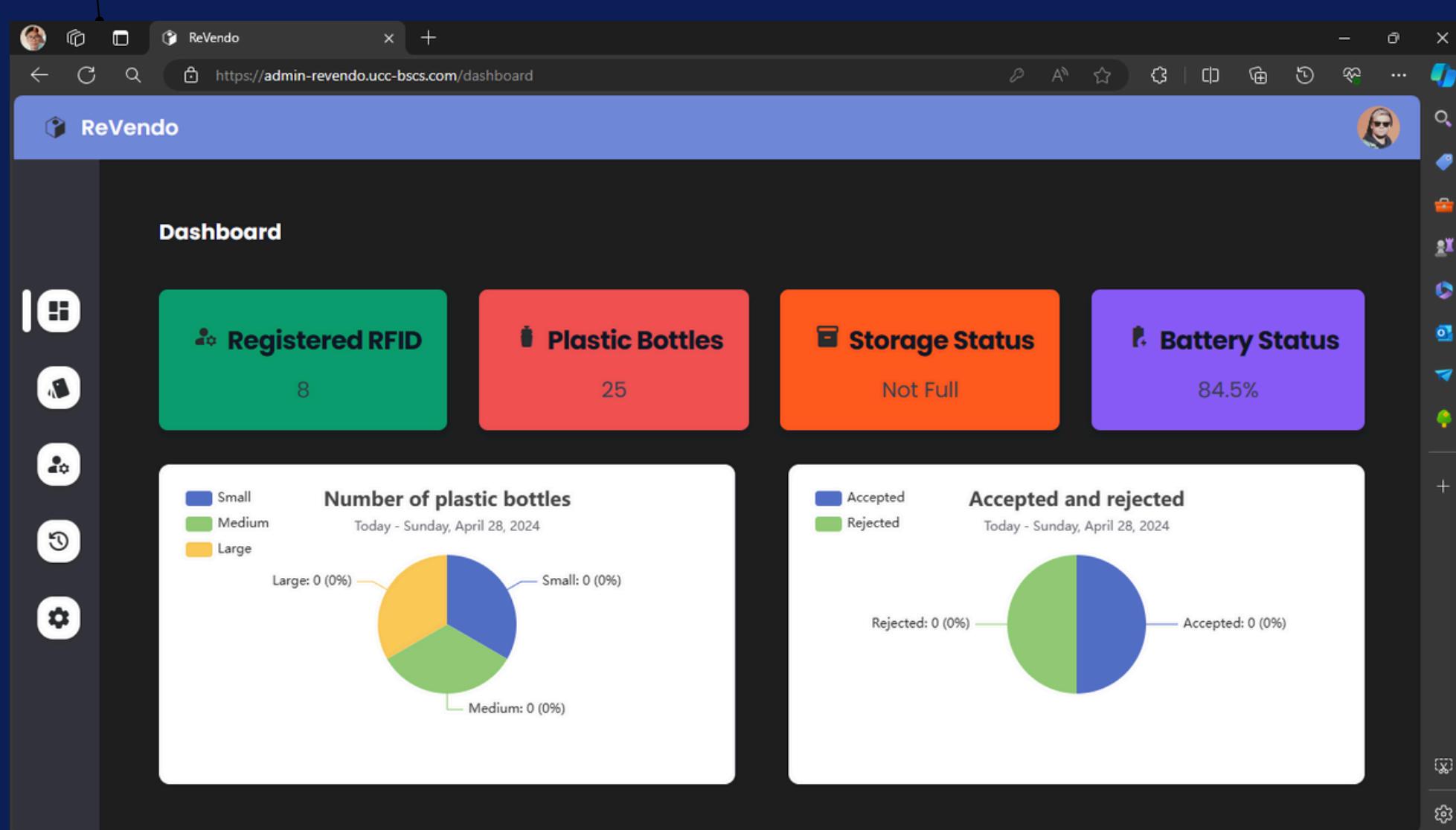
Email: jasper.macaraeg42@gmail.com

Password: ReVendo2023!



You are now successfully login

HOW TO USE REVENDO SYSTEM?



Dashboard Page

This page monitors number registered RFID cards, plastic bottles accumulated inside the machine, storage status, battery status. Moreover, the system has pie chart reports for seeing how many plastic bottles accumulated based on sizes (small, medium, and large). It also filters how many are accepted and rejected based on history.

HOW TO USE REVENDO SYSTEM?

#	RFID NUMBER	POINTS	STATUS	ACTION
1	33a537c2	67	Active	[Edit] [Delete]
2	737832c2	96	Active	[Edit] [Delete]
3	e3153ec2	4	Active	[Edit] [Delete]
4	9305e8be	160	Active	[Edit] [Delete]
5	633bfec1	174	Active	[Edit] [Delete]
6	c3c9101e	100	Active	[Edit] [Delete]

RFID Page

This page use to add, edit, delete RFID cards registered in the system. This page also monitors status and how many points did this rfid card have.

The screenshot shows the 'Add RFID' modal window. It contains fields for 'RFID number' (with '837f43c2' entered), 'Status of RFID' (set to 'Active'), and 'RFID Points' (with 'Enter RFID Points' placeholder). There are 'Add' and 'Cancel' buttons at the bottom. In the background, the main 'RFID' page is visible, showing a list of existing RFID cards with their respective numbers, points, and status.

We are using hardware to be able to send the RFID number inside our system shown picture above.

HOW TO USE REVENDO SYSTEM?

#	NAME	EMAIL	GENDER	ROLE	ACTION
1	Jasper Macaraeg	jasper.macaraeg42@gmail.com	Male	admin	
2	John Kenneth Adriano	jkadriano2002@gmail.com	Male	staff	

Add User

Name
Enter name

Email
Enter email

Gender
 Male Female

Your password

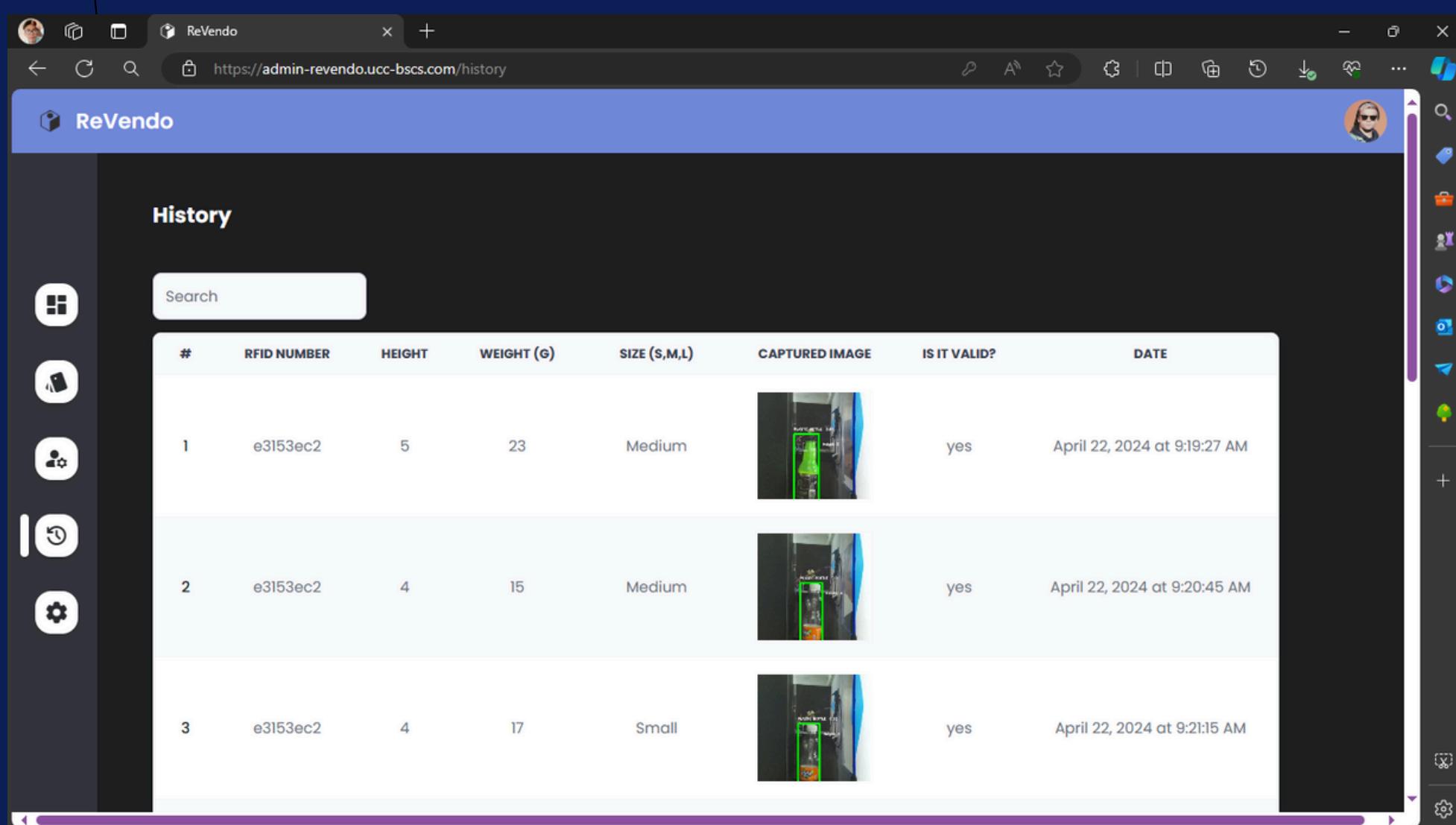
Role
Admin

Add Cancel

Accounts Page

This page use to add, edit, delete users accounts to use the revendo system.

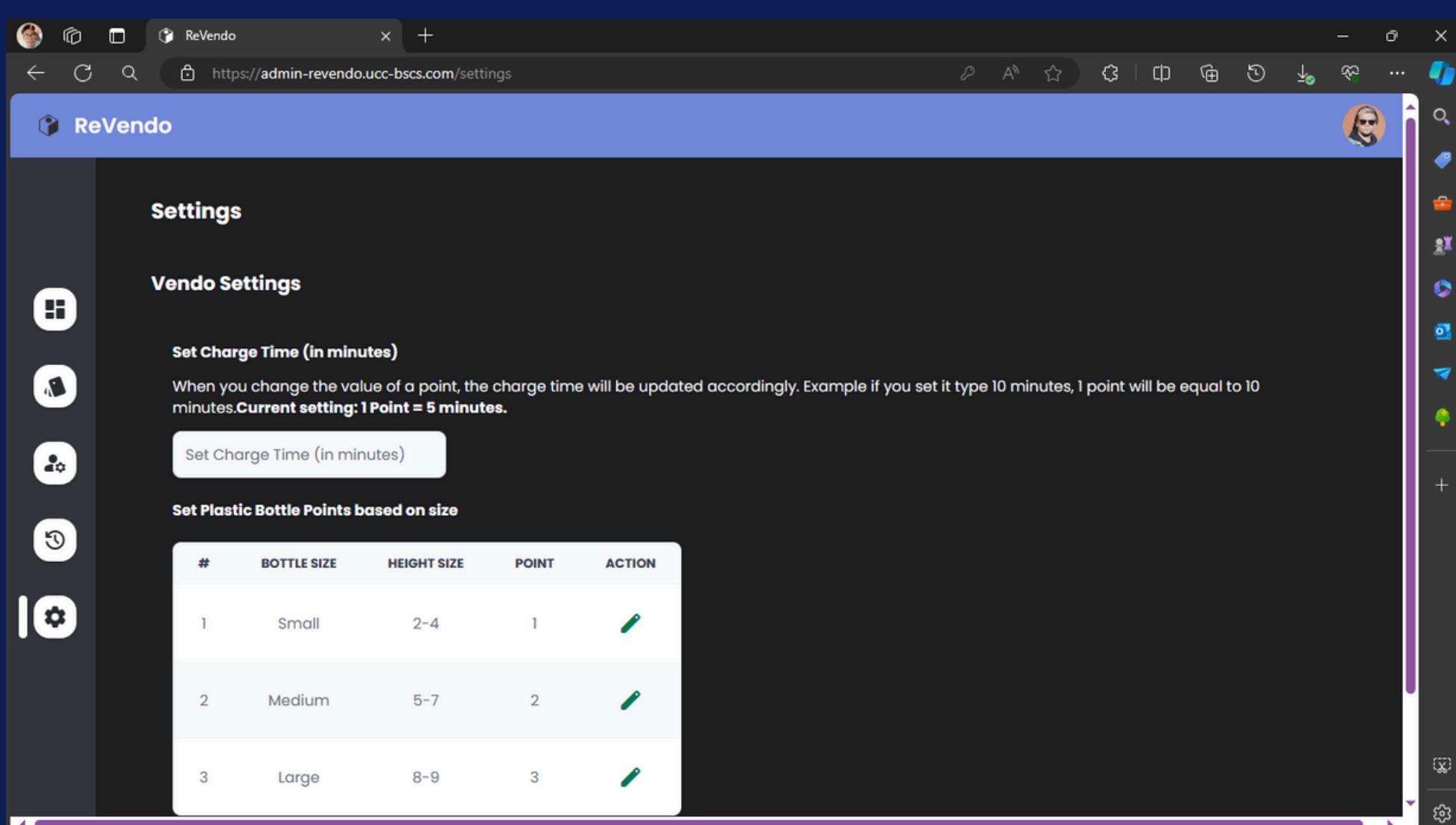
HOW TO USE REVENDO SYSTEM?



History Page

This page uses to see all plastic bottles and objects feed inside the machine this monitors how object has been detected by YOLO model. It shows information like rfid card number of user, height ratio, weight, size of plastic bottle, yolo processed image captured inside the machine, validation and date detected. You can also filter it by using search.

HOW TO USE REVENDO SYSTEM?



Settings Page

This page uses to edit variables of charging station and vending machine to update pointing system. It updates how much charge time to be set in charging station and exchange of plastic bottle based on height and points exchange based on small, medium and large.

HOW TO USE REVENDO MOBILE APPLICATION?

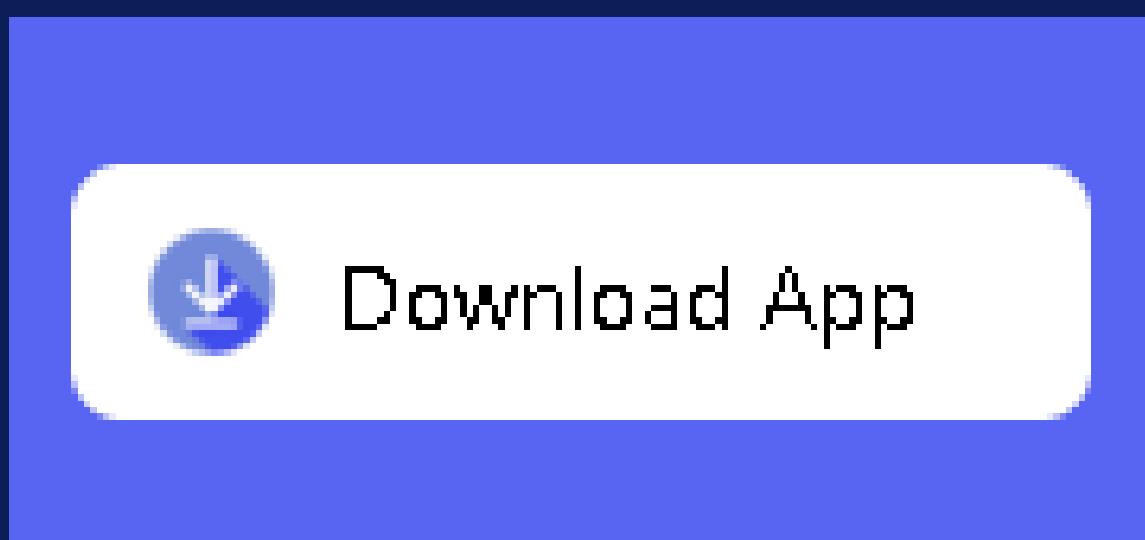
Download the app in our Revendo Landing page

Scan QR CODE

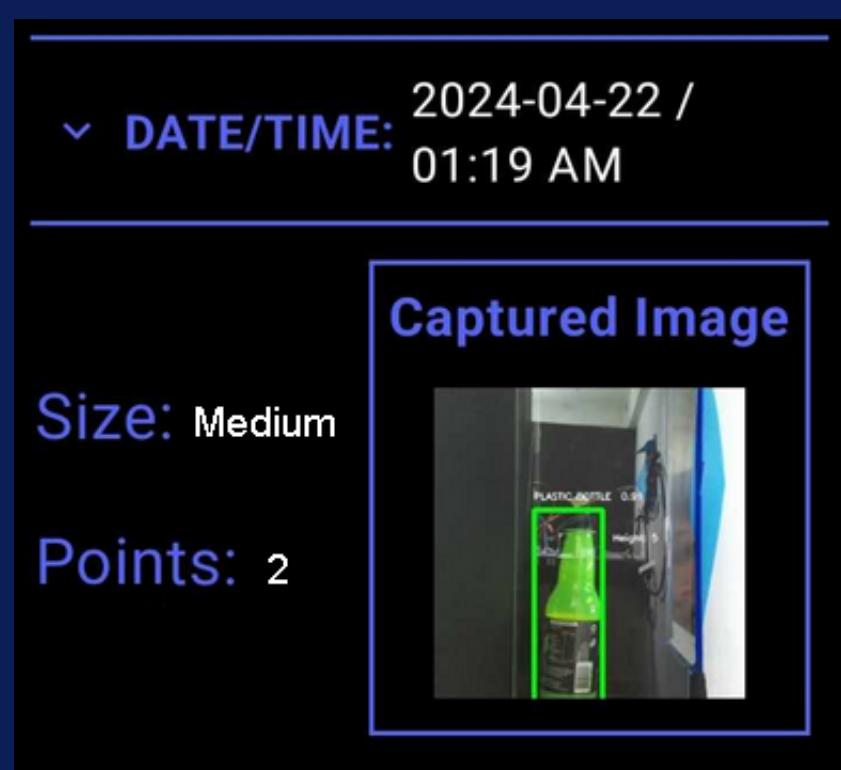
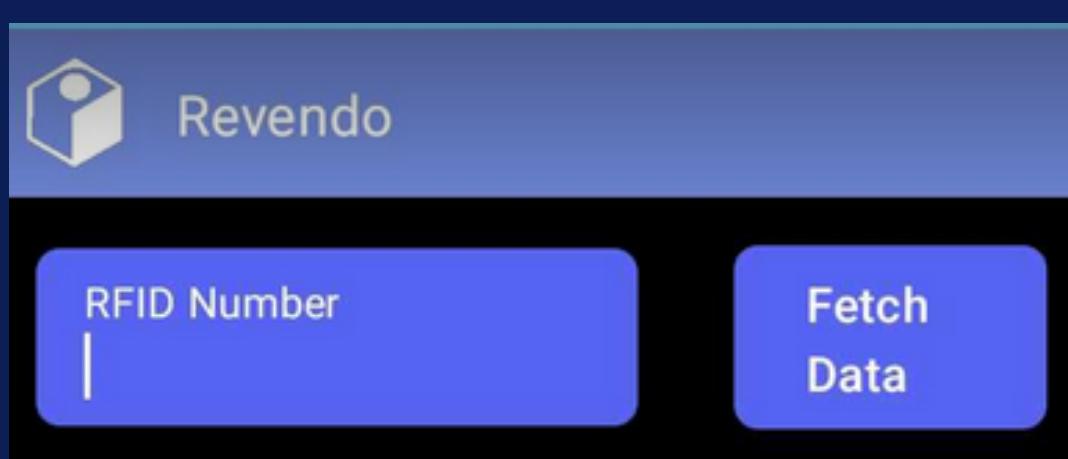


OR

Click the download button



<https://revendo.ucc-bscs.com/>



Revendo App Usage:

Our app consists of three things for its use.

Just enter your RFID Number And Click Fetch data

1. It will show the History of all bottles Accepted/Not Accepted.
2. It can show your current Balance
3. It can filter out the results

Filter by DATE/SIZE

HOW TO USE REVENDO VENDING MACHINE?

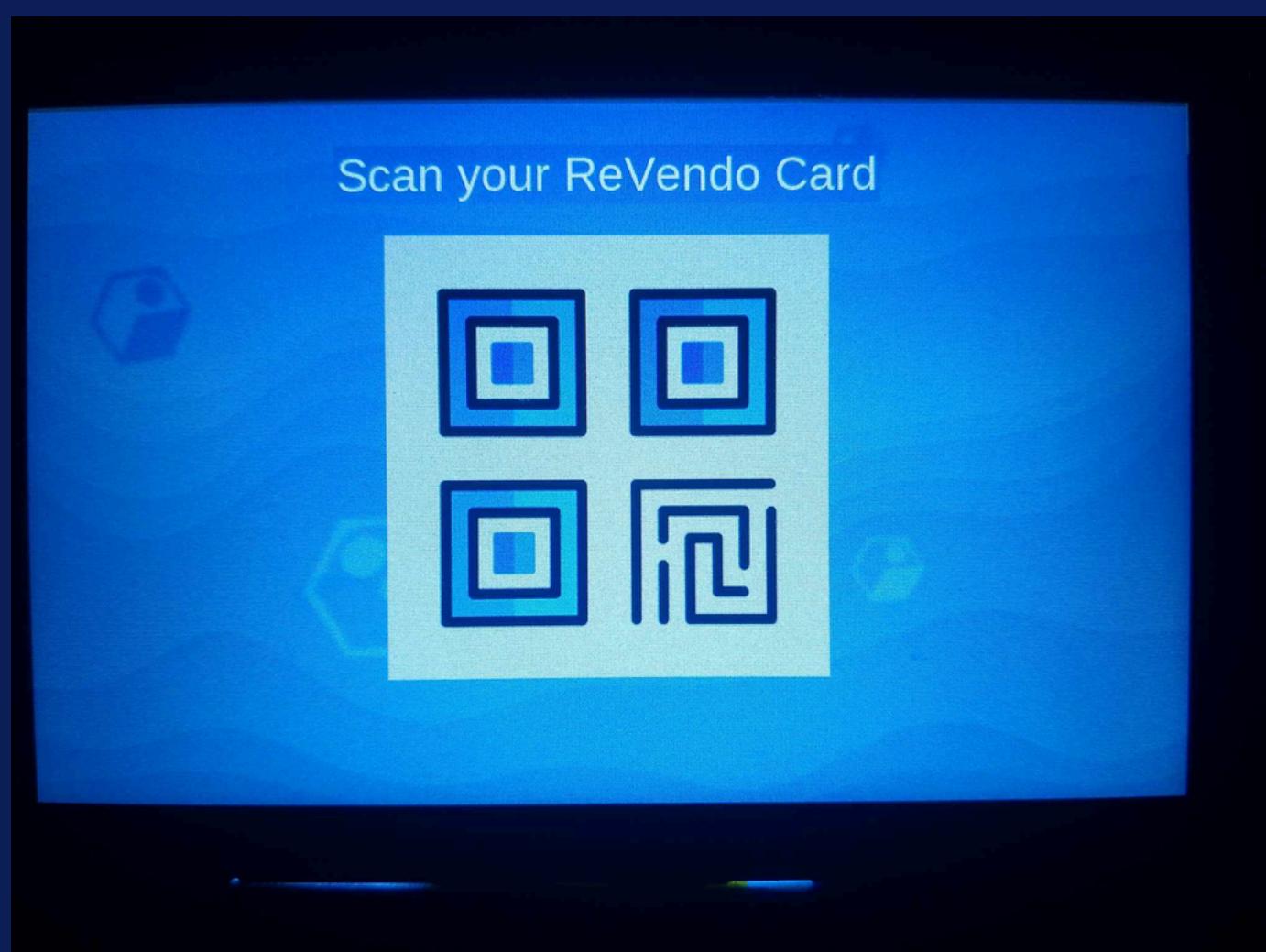


How to get points?

Step 1:

To get points, first go to our reverse vending machine. On the LCD screen there are three buttons demonstrate picture above. Choose Get Points to accumulate points by exchange of plastic bottles.

HOW TO USE REVENDO VENDING MACHINE?

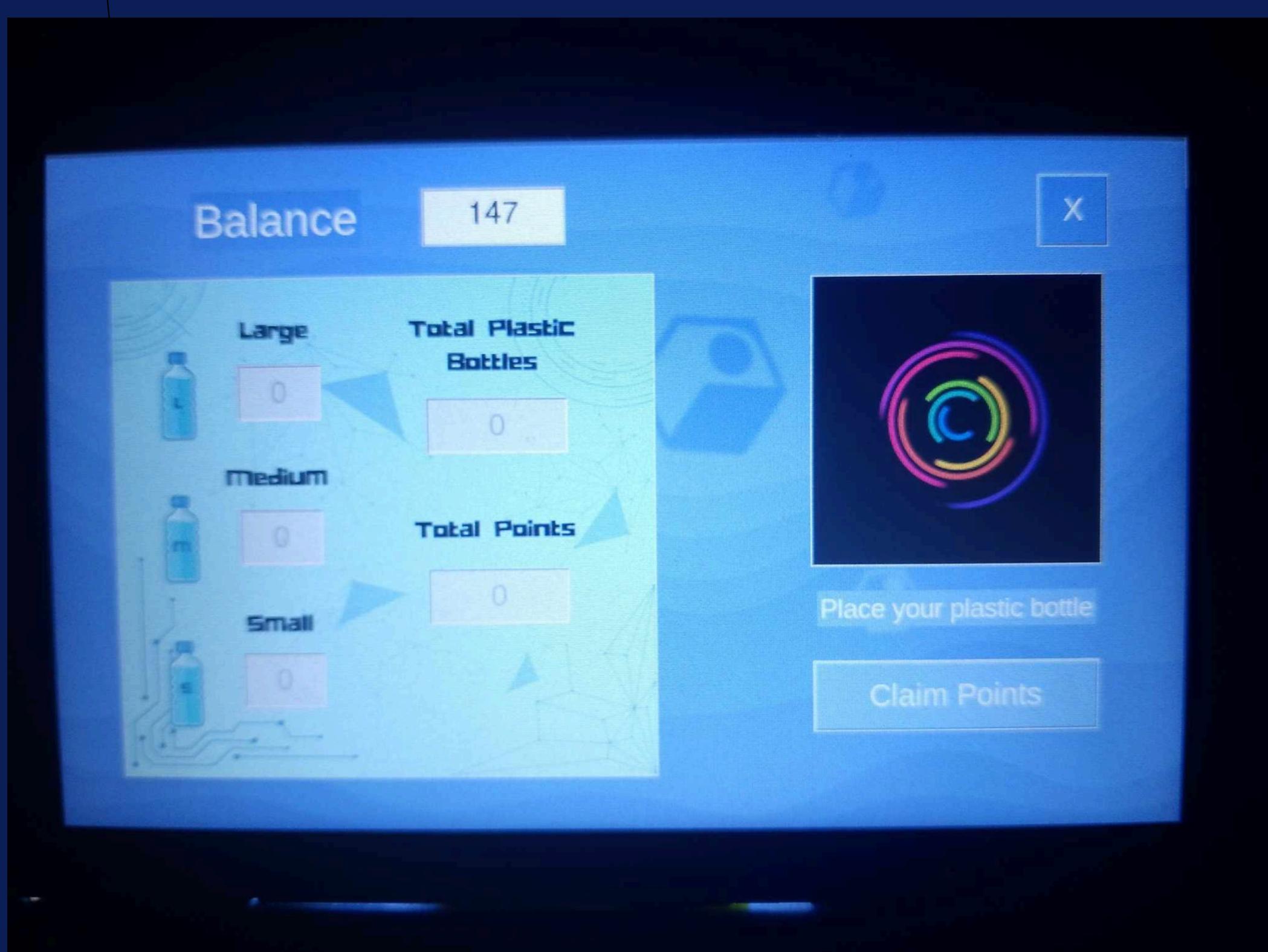


How to get points?

Step 2:

Once tap “Get Points” button, it will show scan your rfid card. Scan your rfid card on rfid scanner.

HOW TO USE REVENDO VENDING MACHINE?

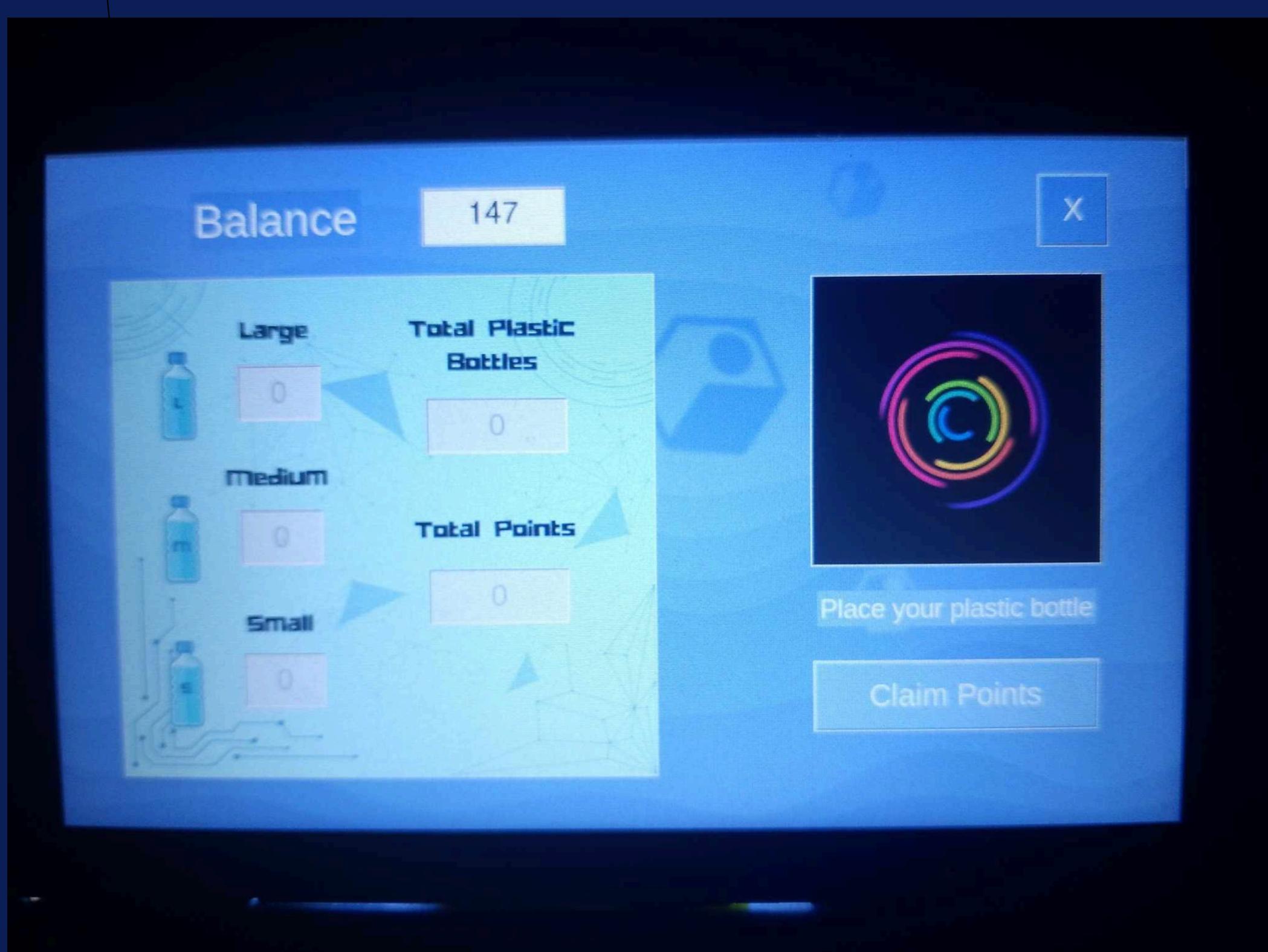


How to get points?

Step 3:

Once RFID is scanned, it shows how many balance you have. It also shows information on how many plastic bottle you feed based on size such as small, medium, and large plastic bottle that are valid and accepted. This screen will update in realtime as you feed more plastic bottle inside the machine. The machine will indicate on screen if is accepted and rejected with sound of buzzer if accepted or rejected.

HOW TO USE REVENDO VENDING MACHINE?

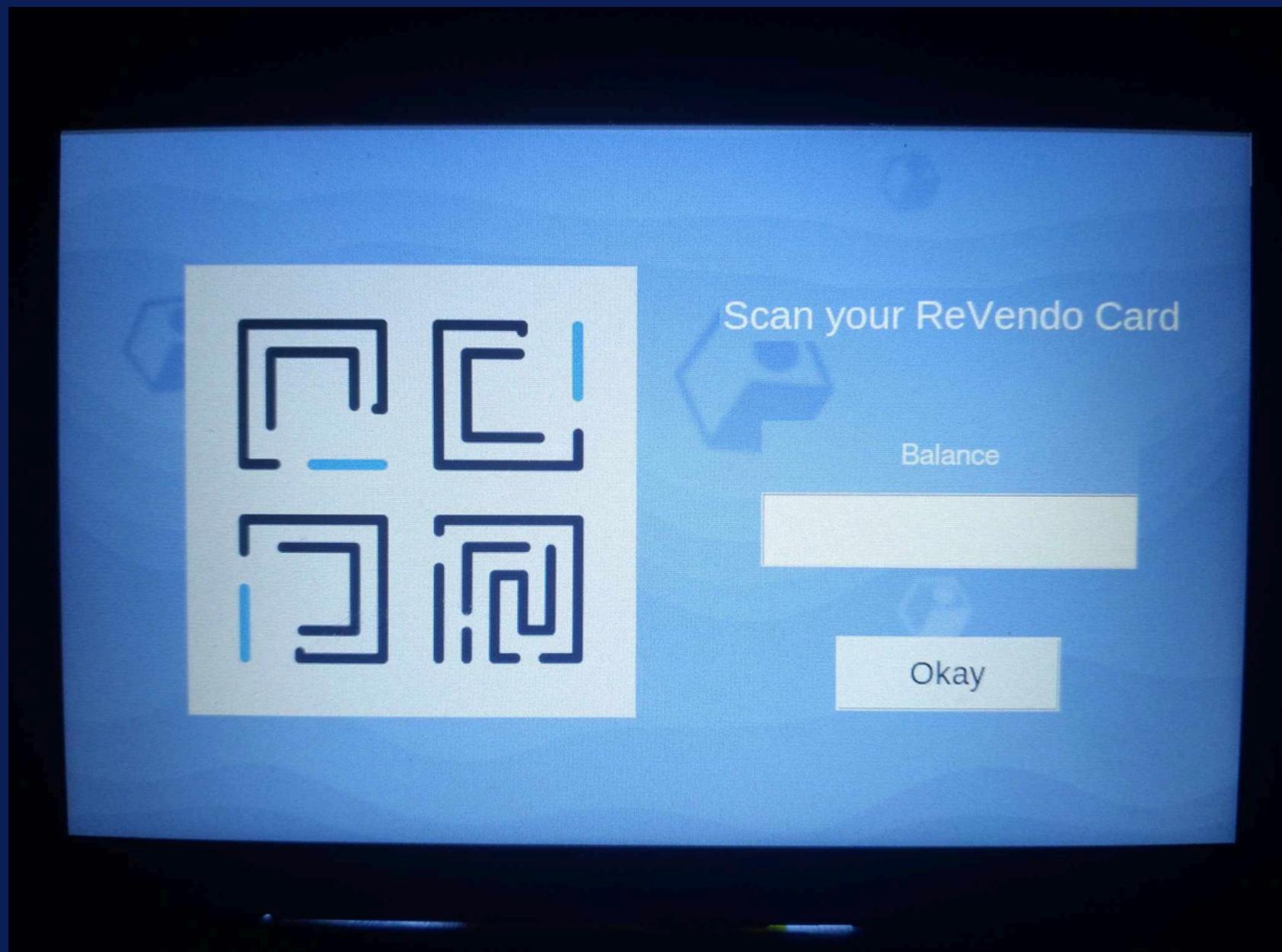


How to get points?

Step 4:

Once done, tap Claim Points Button. The total points will add to your current balance after you tap claim points. Once done you can now use this points on our charging station for your emergency situation. After claim points, will back to Step 1 or Main Menu.

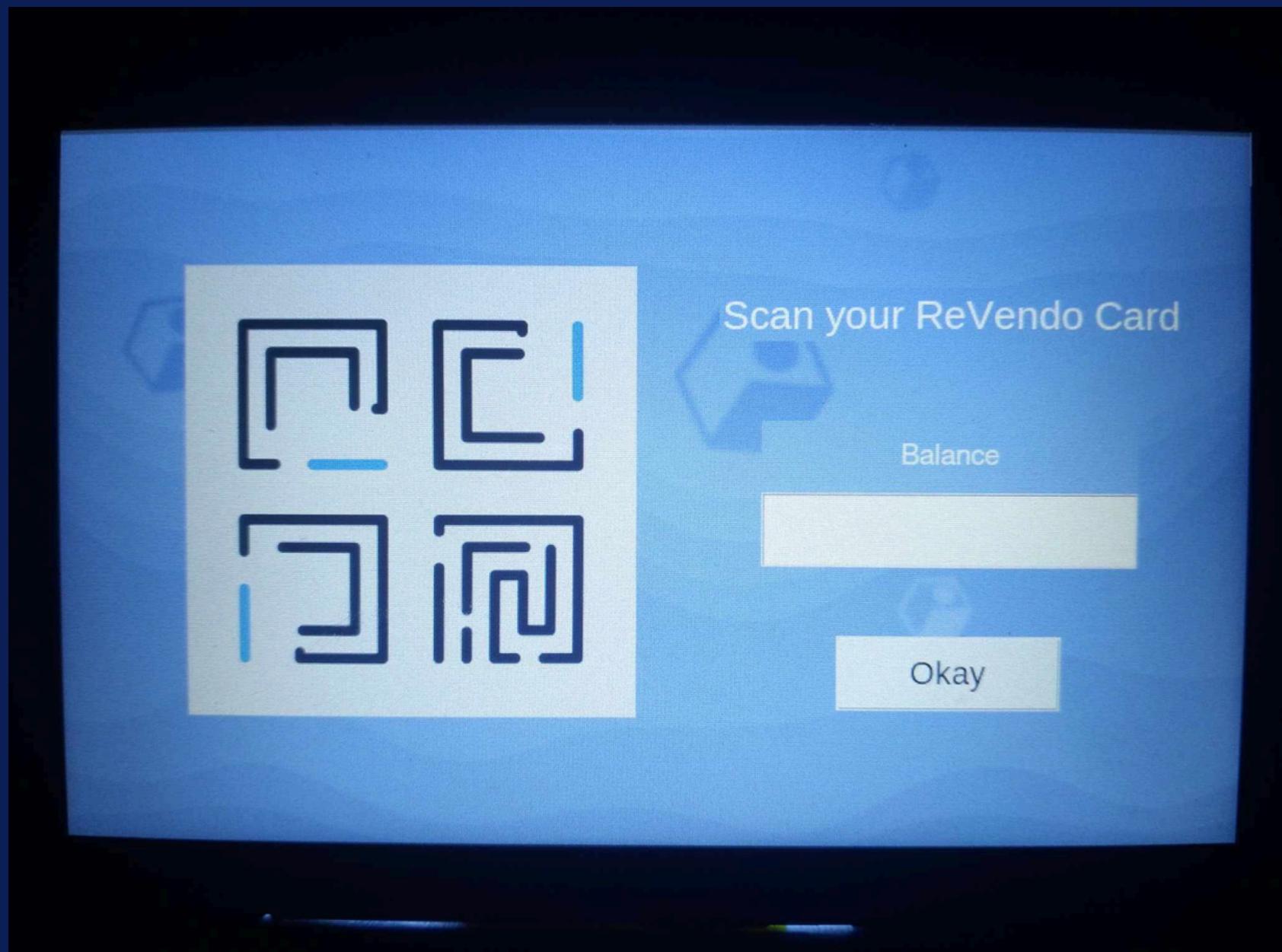
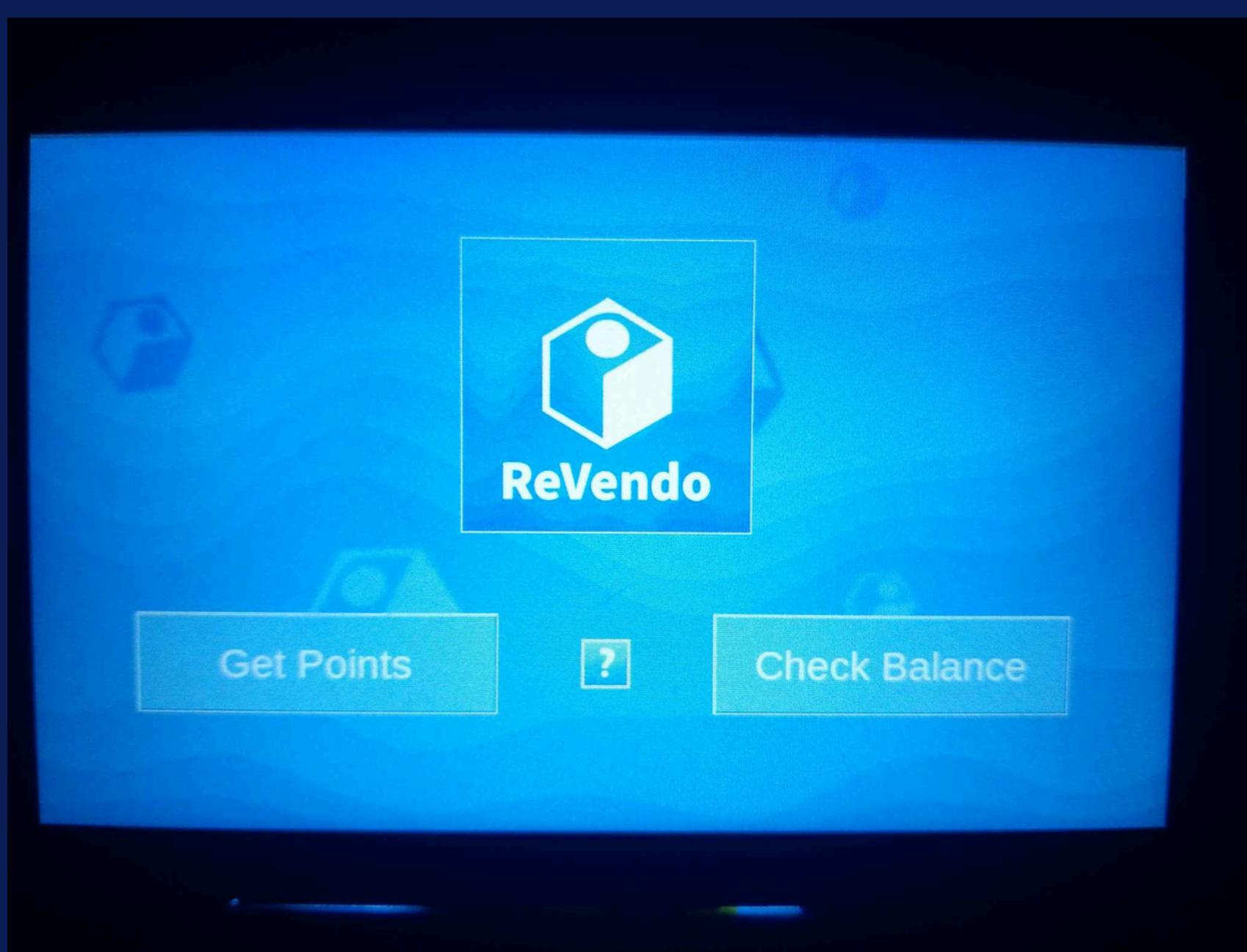
HOW TO USE REVENDO VENDING MACHINE?



How to check balance?

Tap Check Balance Button. After that it will show that tap your rfid card once done it will show your current balance. Tap Okay Button once done.

HOW TO USE REVENDO VENDING MACHINE?



How to check balance?

Tap Check Balance Button. After that it will show that tap your rfid card once done it will show your current balance. Tap Okay Button once done.

HOW TO USE REVENDO CHARGING STATION?



How to use my points in charging station?

Step 1:

Scan your RFID Card

Step 2:

Adjust charge points with (+) plus or (-) minus button

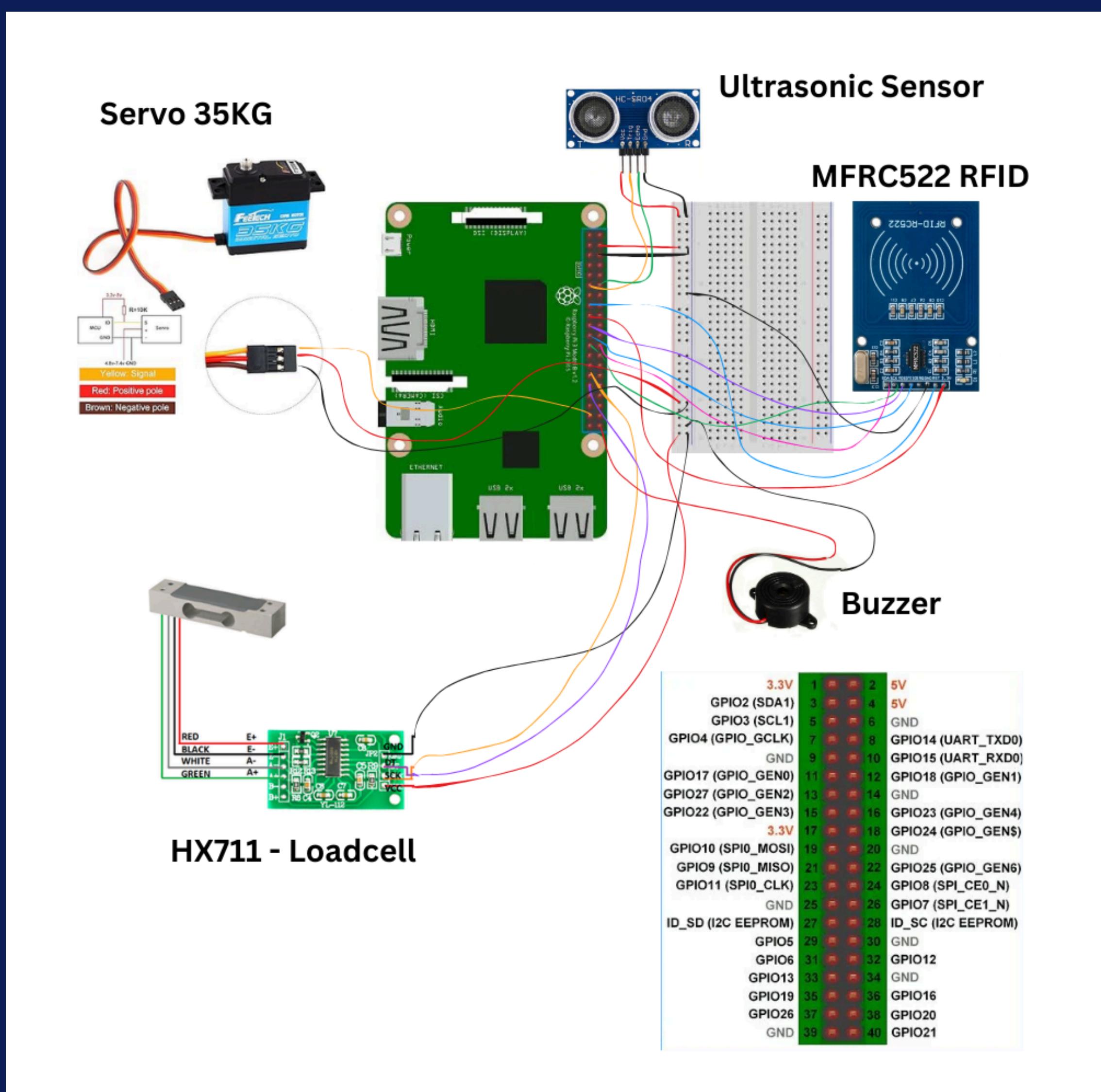
Step 3:

Rescan your RFID scan when ready

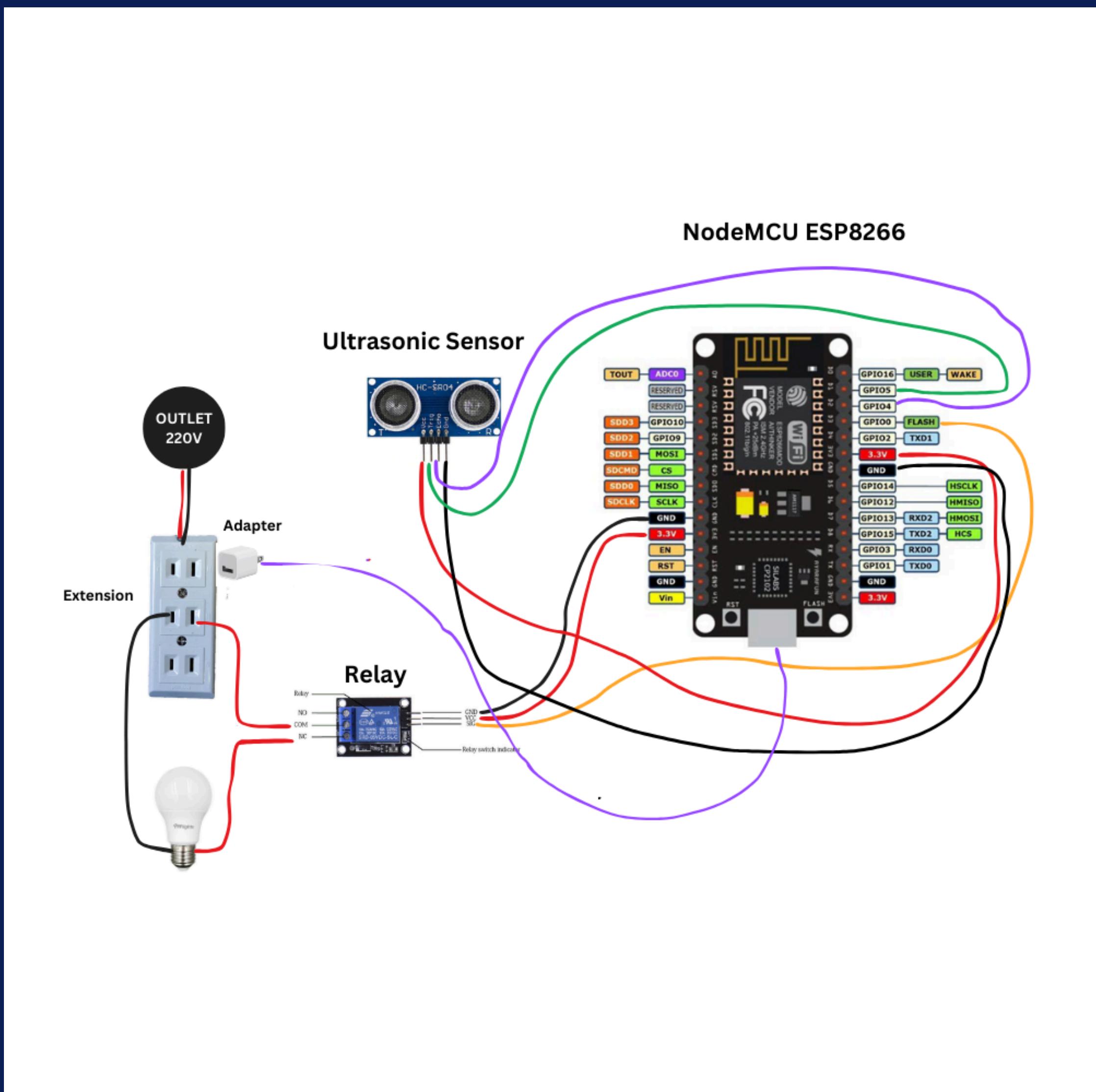
Step 4:

Time remaining is now running. Ready for charging devices

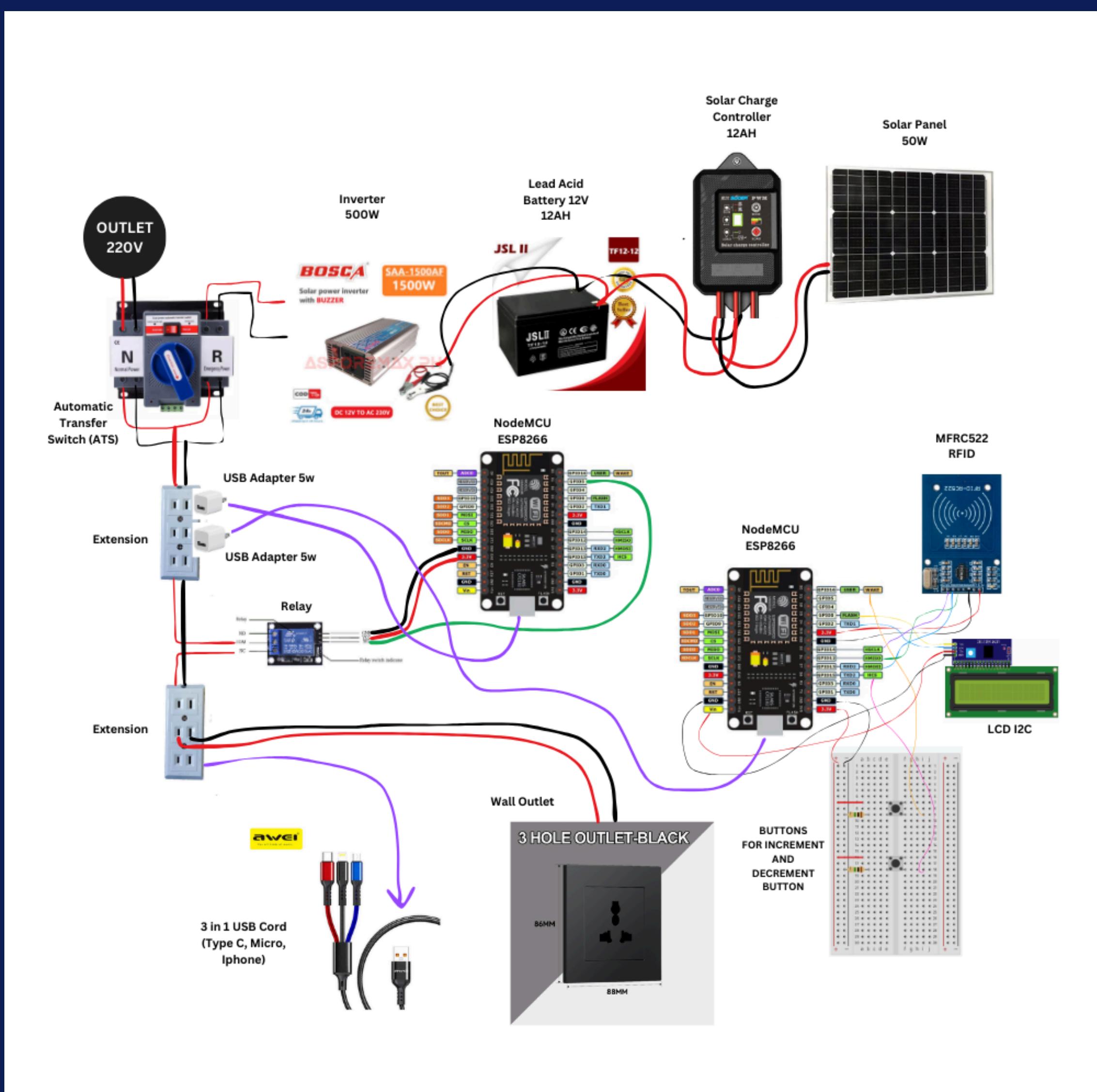
HOW TO SET UP REVERSE VENDING MACHINE?



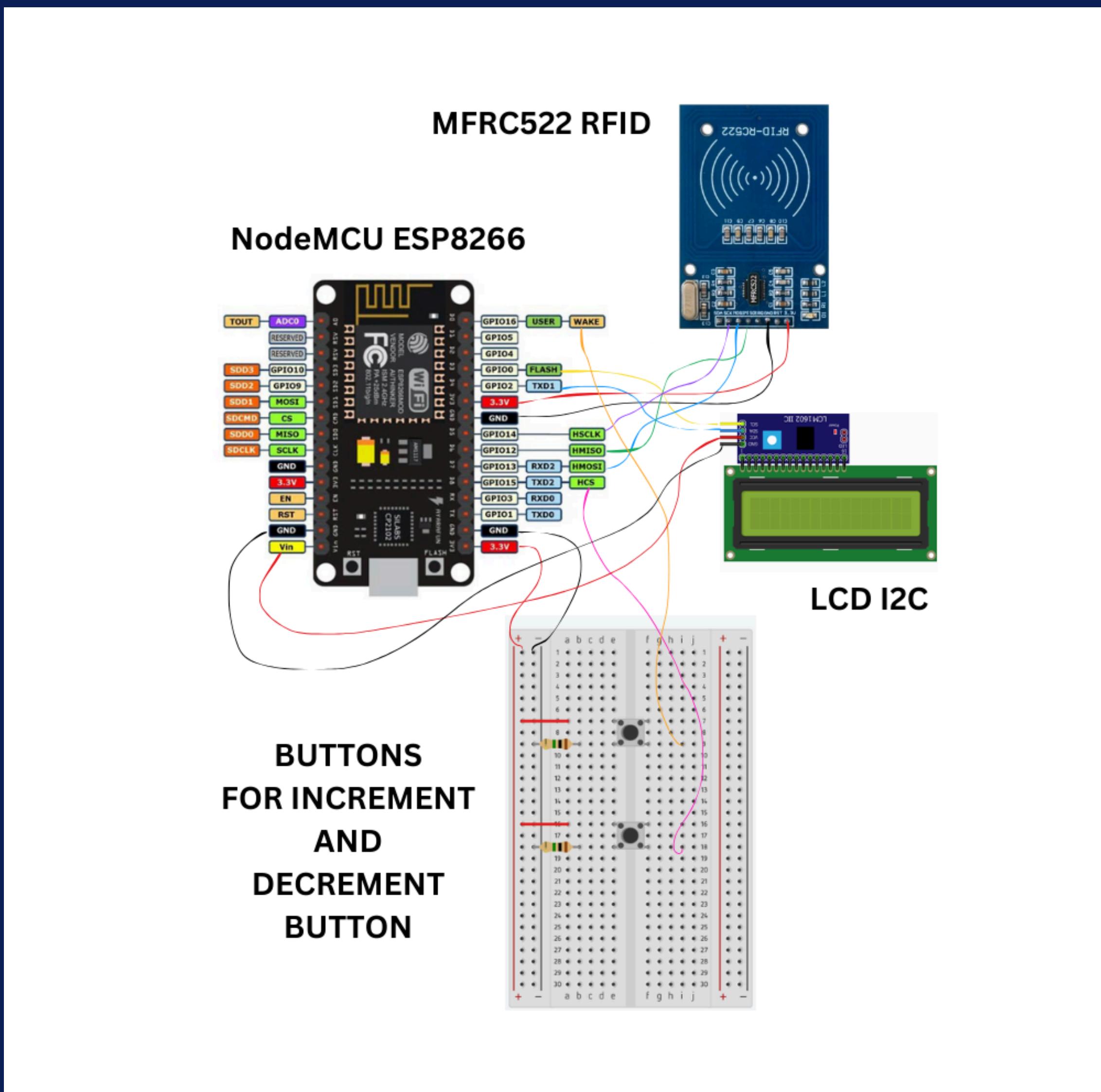
HOW TO SET UP REVERSE VENDING MACHINE?



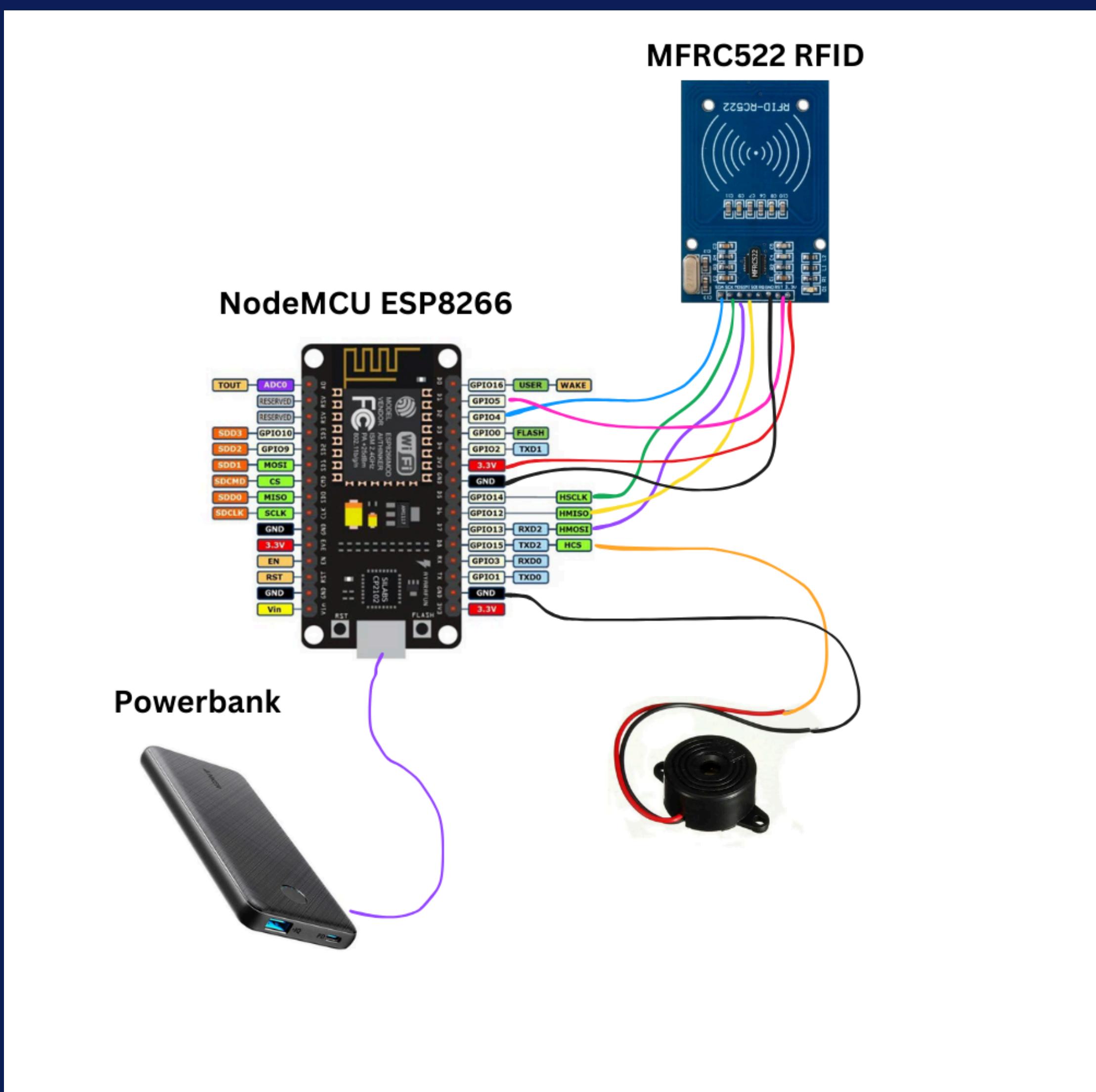
HOW TO SET UP CHARGING STATION?



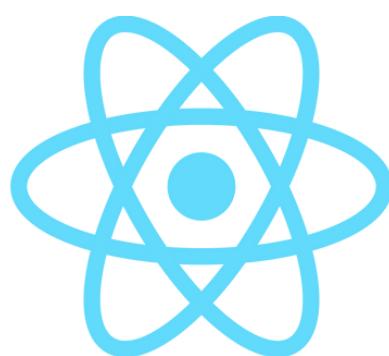
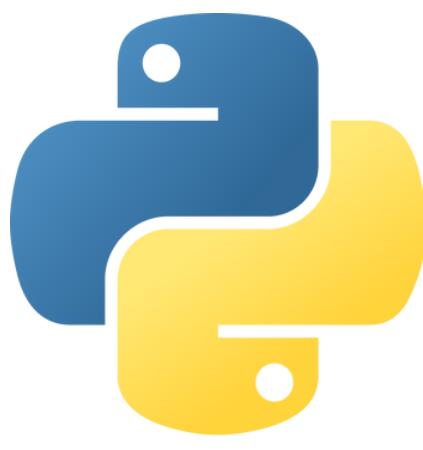
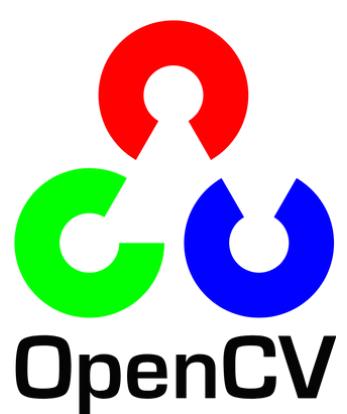
HOW TO SET UP CHARGING STATION?



HOW TO SET UP RFID REGISTER SCANNER?



TECHSTACK OF THIS PROJECT



express

