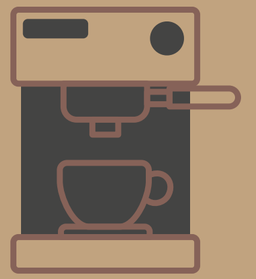
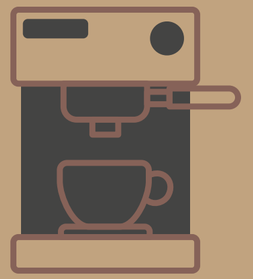


SMART COFFEE MACHINE

HARDWARE PROJECT

PRESENTED BY :
Eman Khaled & Hadeel Jumaa



Agenda

01 Main Idea

02 Features

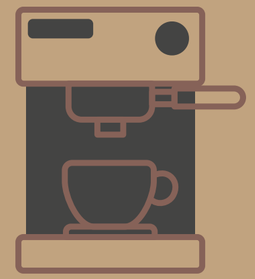
03 Motivations

04 Hardware Modules

05 Constraints

06 Future Work

Main Idea

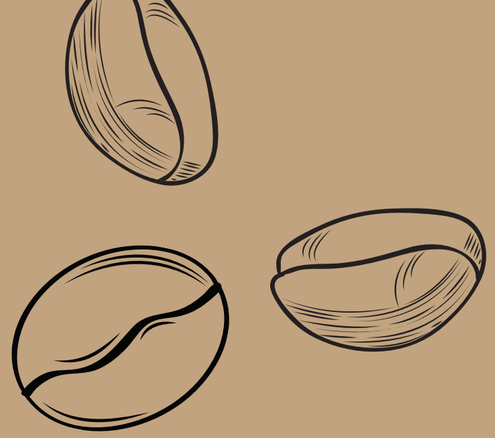


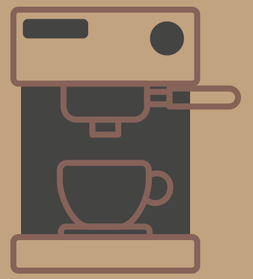
The smart coffee machine offers a variety of beverages including coffee, coffee with milk, and espresso, each with its own unique concentration.

Improved User Interface
The device integrates an intuitive LCD screen, along with a keypad interface for the ordering procedure.

Beyond Coffee
With the Coffee Machine, You can specify the desired quantity and taste.

Effortless Dispensing
With the inclusion of an automated cup dispensing and conveyer belt system, user intervention is no longer necessary.





Features

2 methods of ordering drinks

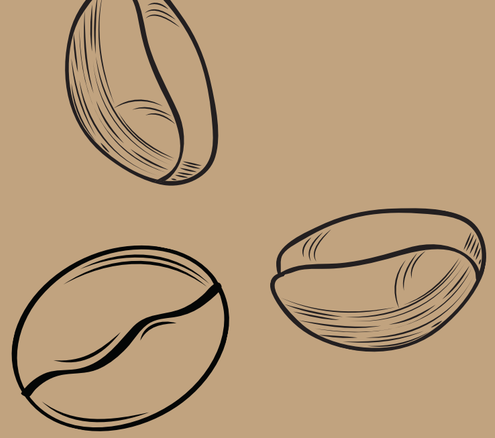
The intuitive LCD, keypad through entering a password and RFID card system, provide seamless options for ordering beverages with utmost convenience.

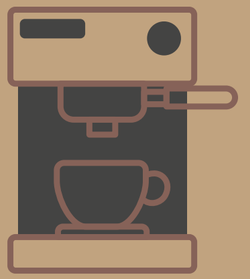
Level automation

The ultrasonic sensors for coffee and milk facilitate precise and automated level management.

Small & Large Quantities

Our machine can cater to the specific quantity of the beverage you desire.





Features

Temperature Automation

The coffee and milk temperature sensors enables accurate and automated temperature control.

Seamless Dispensing

The cup dispensing mechanism ensures that there is no need for user involvement throughout the entire process of preparing the beverage.

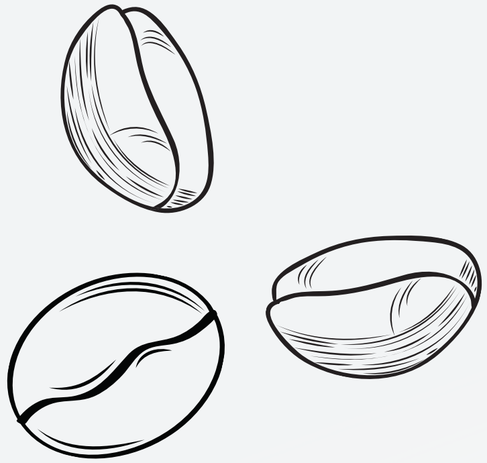
Motivations

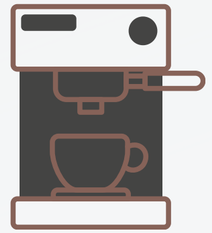
Convenience

The aim is to provide users with a convenient and efficient way to prepare their drinks.

Modernization

The development of this machine aligns with the trend of incorporating technology and automation into everyday tasks.





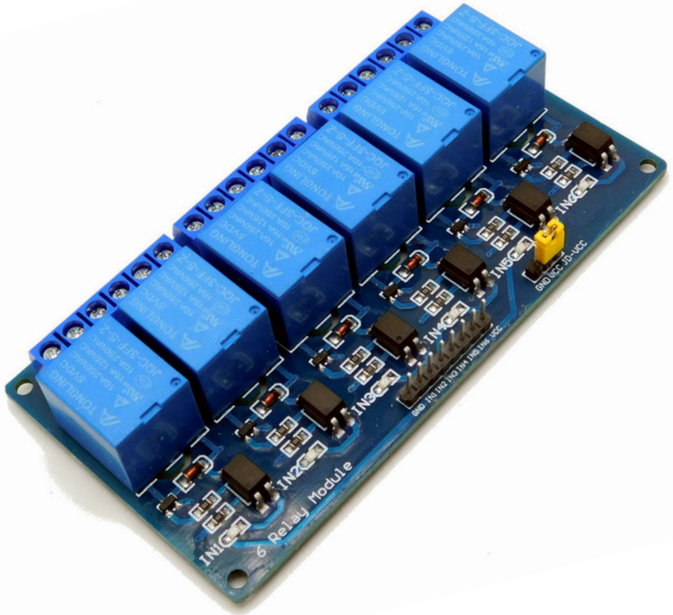
Hardware Modules

HEATING UNIT

plastic kettle

Temperature Sensor

HEATING UNIT

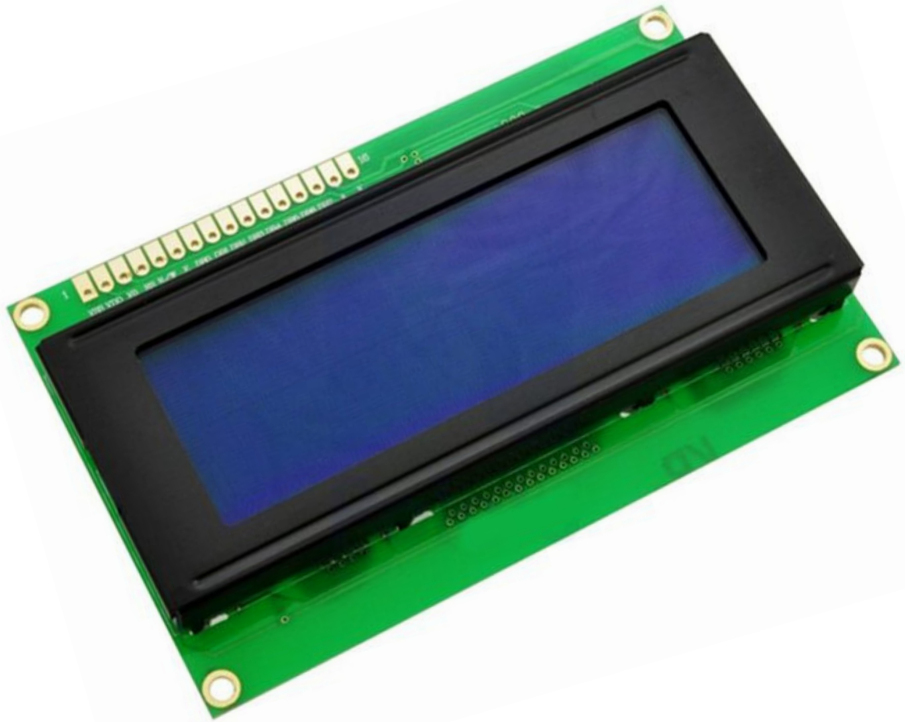


Relay

Pump

Valve

Input/Output Unit



LCD

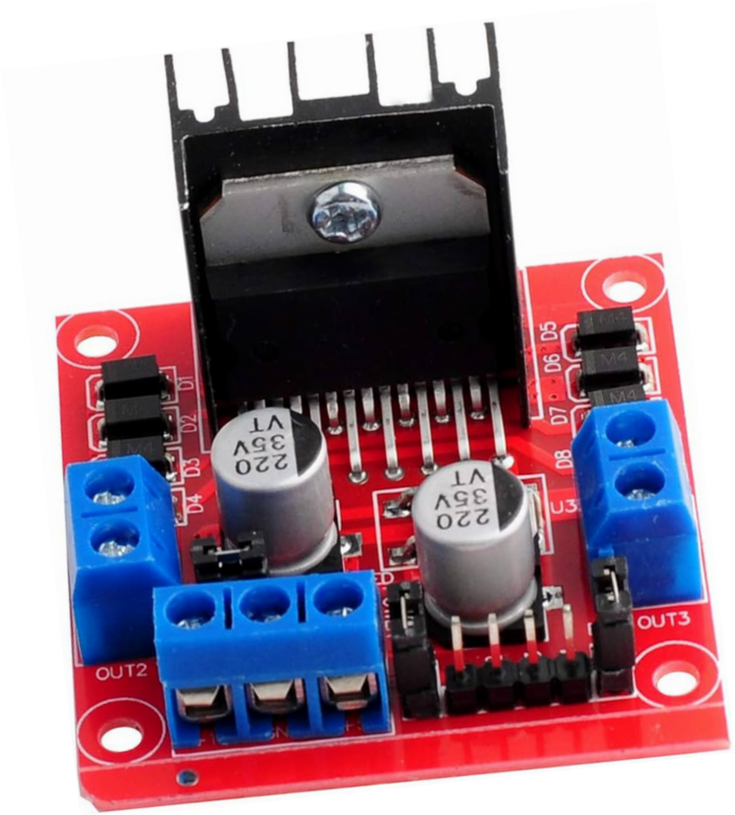
Keypad

Input/Output Unit

RFID

DC Motor

Input/Output Unit



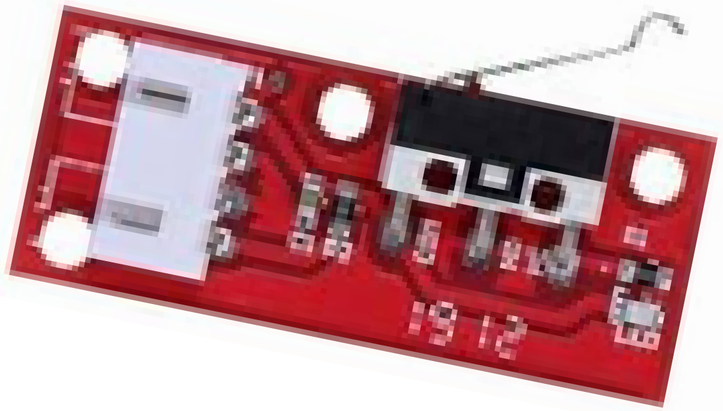
H-Bridge

Stepper Motor

Input/Output Unit

Stepper Driver

Hall Effect Sensor



Limit Switch

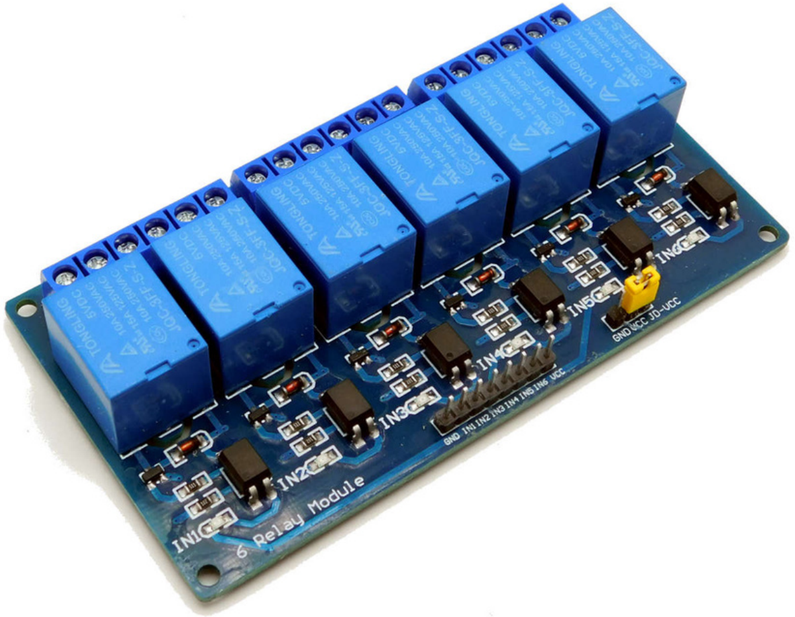
Making Coffee Unit

Stepper Motor

Ultrasonic

Making Coffee Unit

Pump



Relay

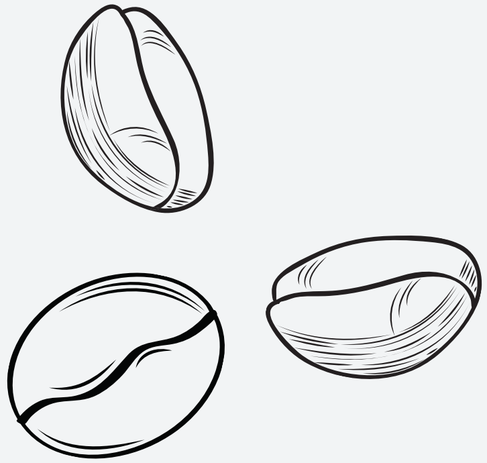
Valve

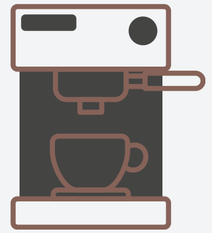
Control Unit

Arduino Mega

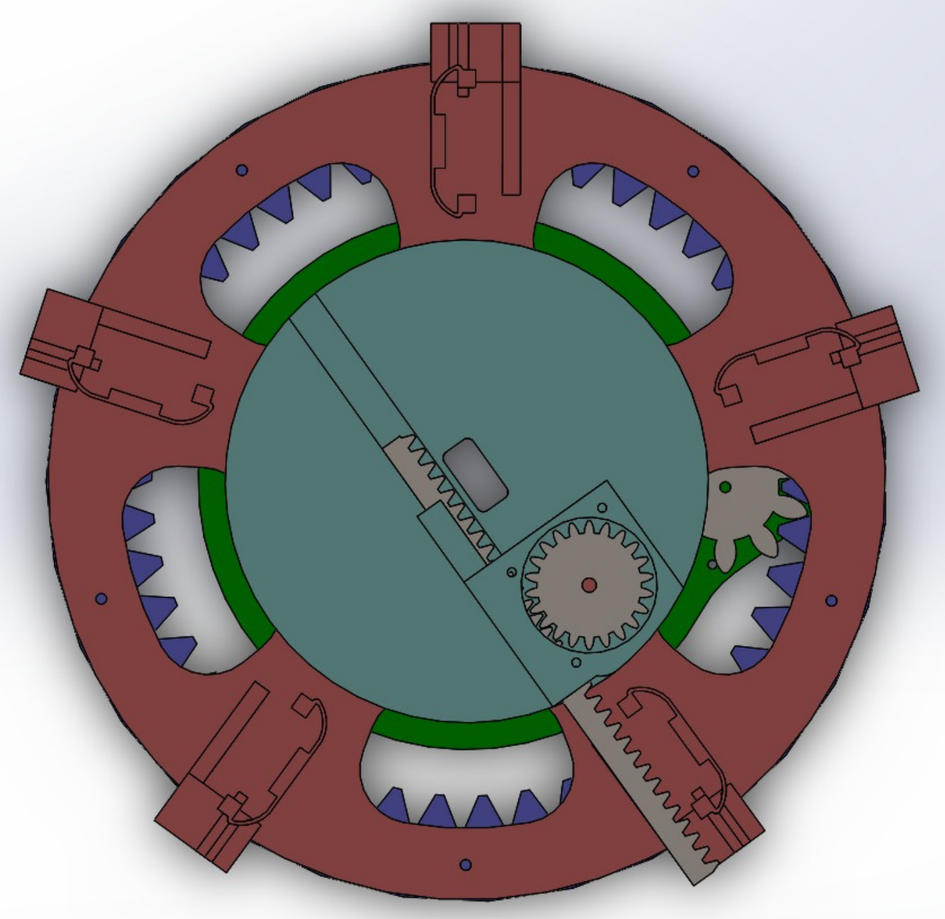
Powering Devices

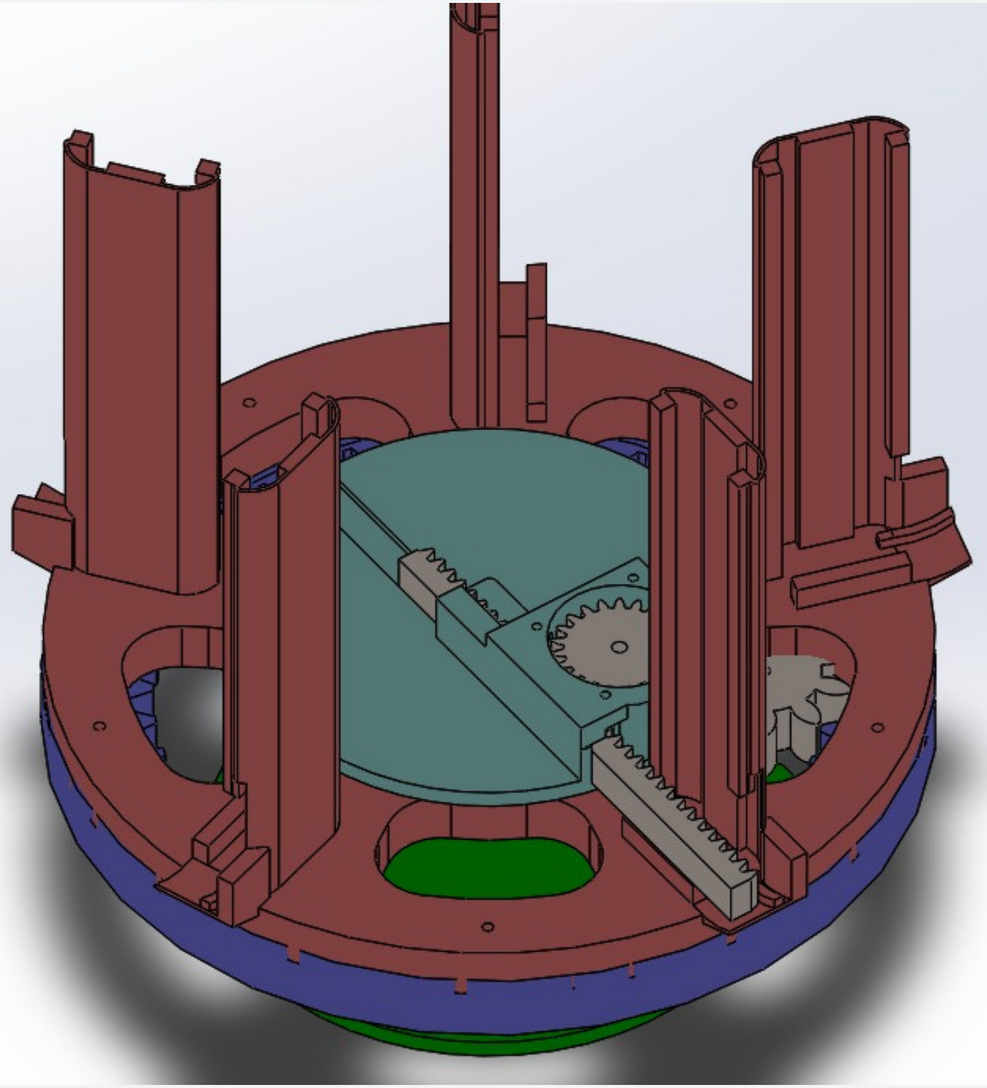
Power Supply

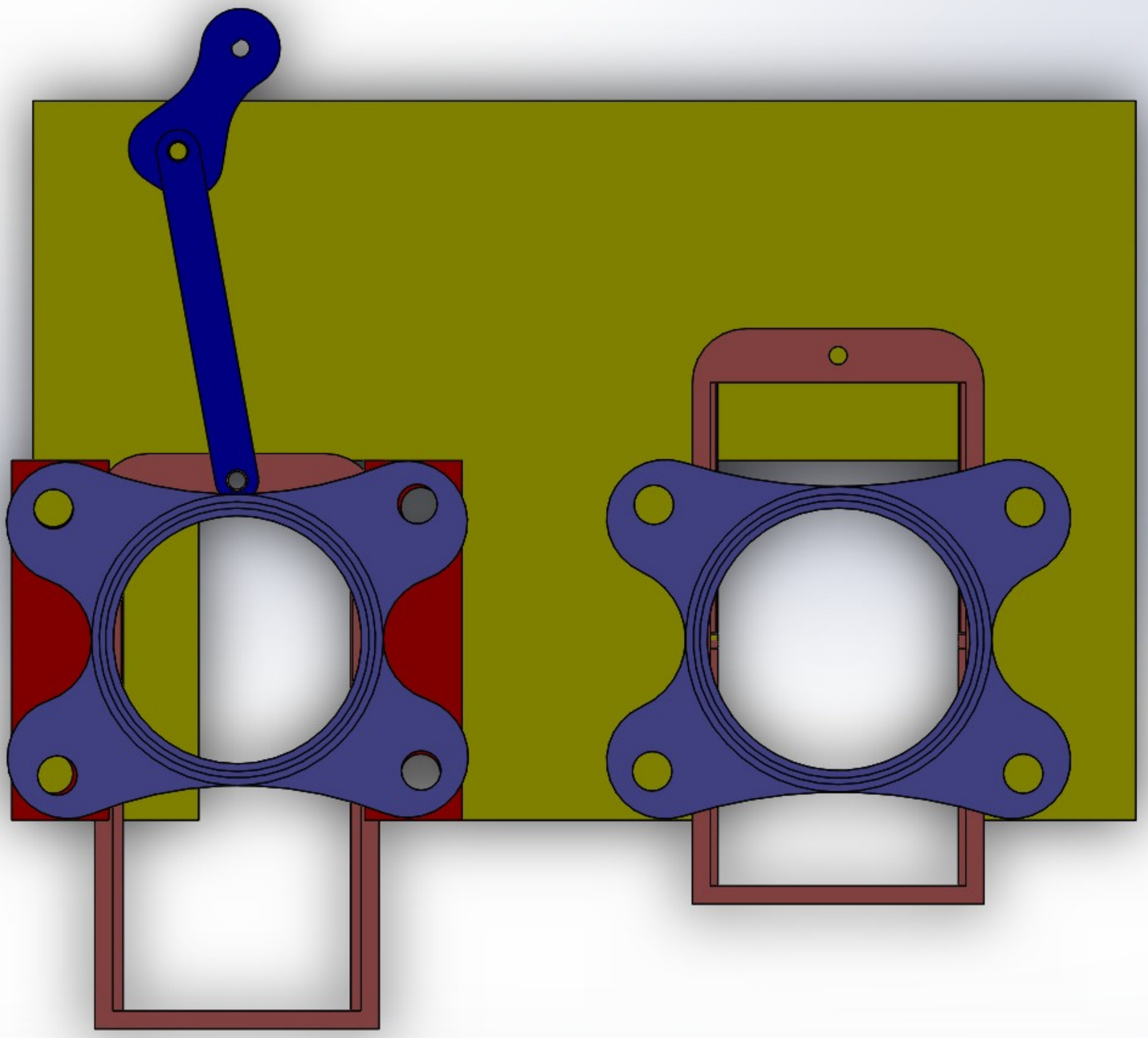


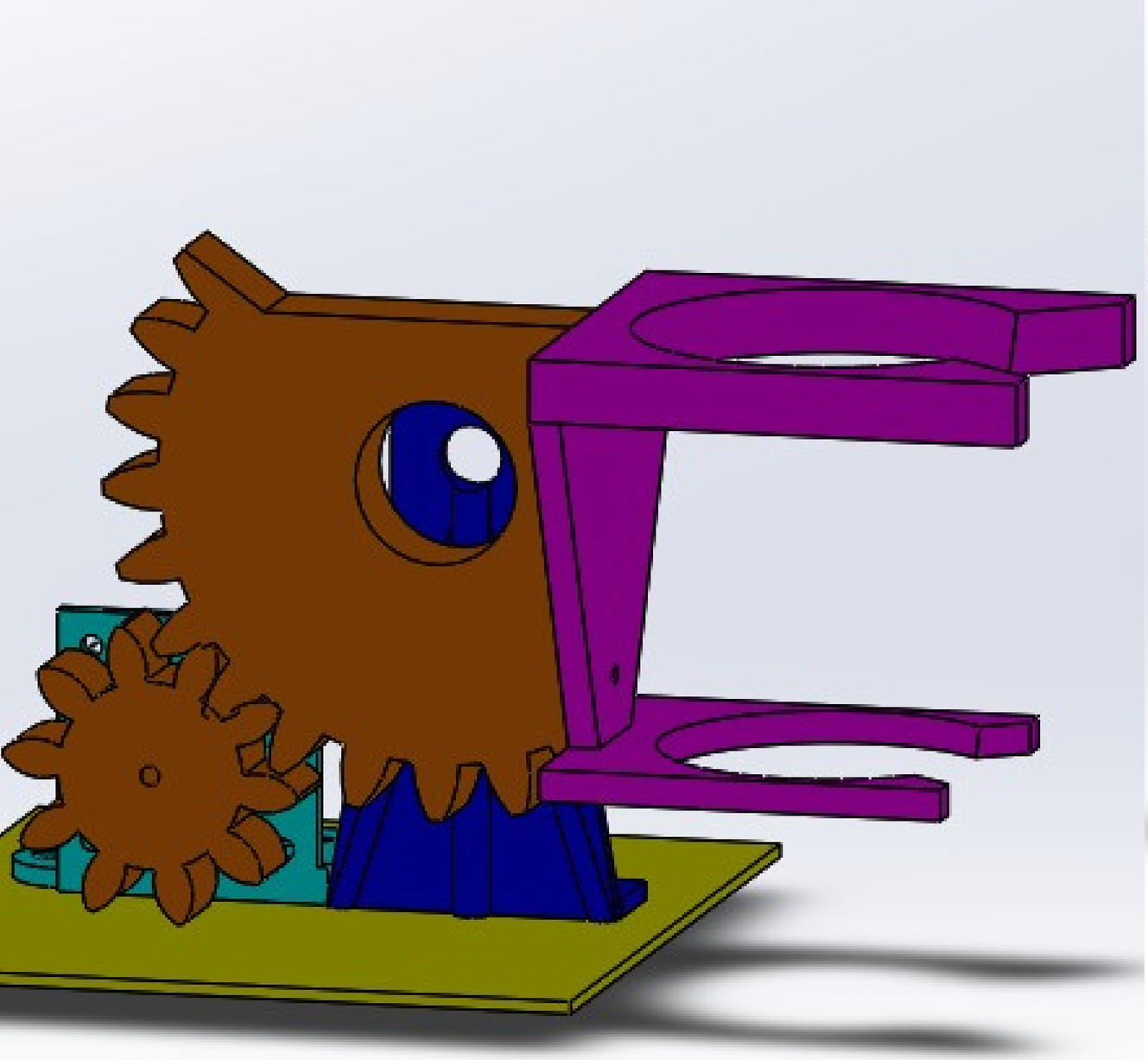


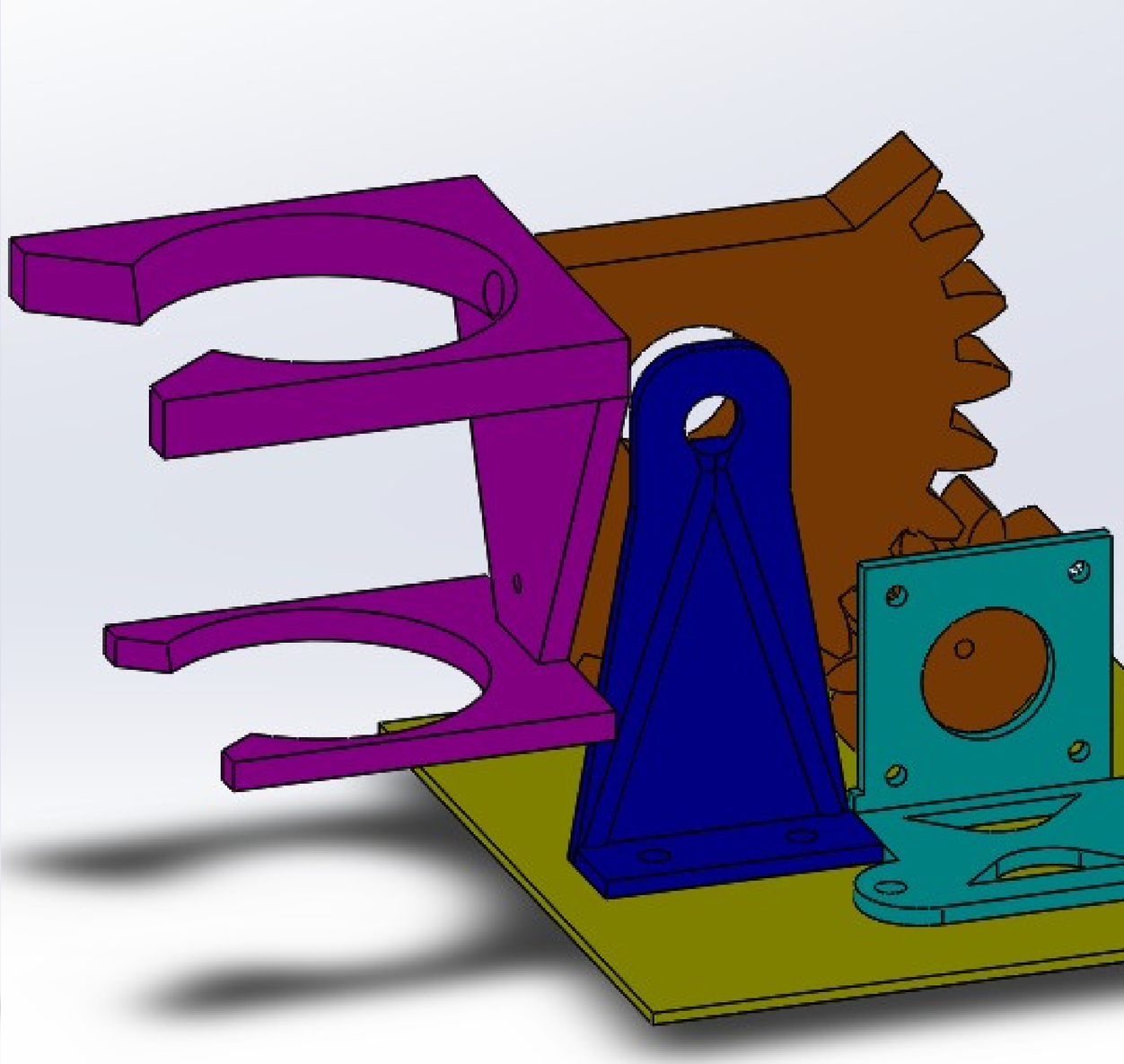
3D Printing →

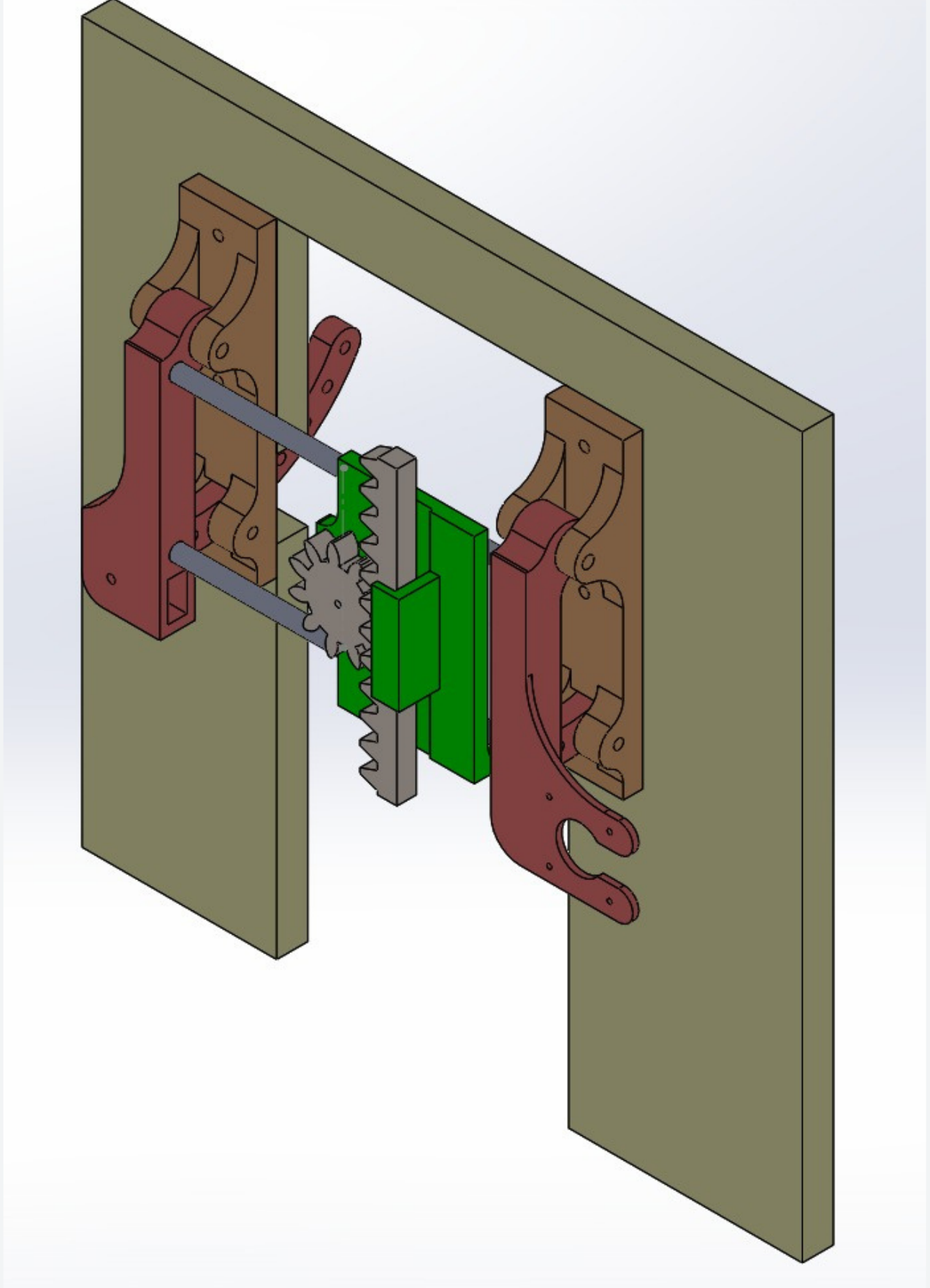




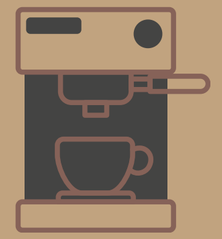




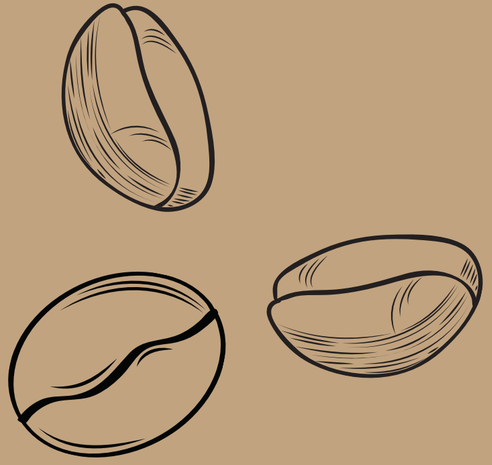




Constraints



1. **Difficulty in choosing a DC motor suitable for capsule compression.**
2. **Difficulty determining the appropriate heating temperature for fear of melting the plastic.**
3. **Differentiating the Selection Challenge, Assessing Diverse Varieties of Stepper Motors to Determine the Best Match.**
4. **We faced some issues controlling the flow of milk and coffee from both heaters toward the cup when using the valves. Therefore, we added the valves with pumps to control the flow of coffee and milk in a smooth and efficient manner.**



Future Work

Adding drawing to coffee using milk.

Automatic filling of coffee and milk.

To maintain the quality of the subsequent beverage, it is essential to clean the group head after each use.

THANK YOU