## Project Description:

This project is a controller for a hot plate. It will control the power delivered to the hot plate. There will be a control system using a sensor. There will be a display and buttons for the user interface.

## Requirements:

The system shall bring the hotplate to a user specified temperature quickly while avoiding overshoot.
The system shall utilize a feedback mechanism.
The software shall run on an STM32 Nucleo board.
The system shall be able to respond to disturbances.

## Scenario:

The user wants to make the perfect pancakes.
They input the temperature that they want.
The hot plate will quickly get to that temperature and give notice.
The hot plate will try to maintain that temperature when a disturbance like pancake batter is added.

## Design Alternatives:

The major design alternatives will be around the control system. I would like to try to implement it as an artificial neural network (ANN) but will do a proportional-integral-derivative (PID) control if I have a problem with ANN.

Another design alternative will be for the display being e-paper with a fallback option of doing a basic 16x2 character display.

The input buttons, thermocouple, and the control solid-state relay are solid design options and fallback alternatives have not been considered.

## Block Diagrams: