

Initialize necessary modules and pins

- Import required libraries (machine, time, etc.)
- Set up OLED display with I2C interface
- Set up button pins and rotary encoder for input
- Initialize PWM pin for temperature control
- Define PID control parameters (kp, ki, kd)
- Initialize DS18B20 temperature sensor and scan for devices

Initialize variables

- Set default temperature setpoint
- Initialize PID control variables (integral, previous error, etc.)
- Display default set temperature on OLED

Main loop:

Try:

- Check the state of the mode button
- If button in state (0):

Enter manual mode:

- Continuously read rotary encoder for desired temperature setting
- If the rotary encoder value changes:
  - Update the set temperature and display it on the OLED
- Check if the state of the mode button is pressed changed:
  - Display a message indicating switching to saved values
  - Exit manual mode

If the rotary encoder switch is pressed:

- Save the current temperature as the set temperature
- Initialize PID control variables (error, integral, etc.)
- Enter PID mode:
  - Continuously monitor and control temperature
  - Calculate the error between the current temperature and setpoint
  - Apply the PID formula to calculate the output
  - Update PWM duty cycle based on PID output
  - Display current and set temperatures on OLED

If the rotary encoder switch is pressed again:

- Exit PID mode and re-enter edit mode

Exit manual mode and return to the main loop

Else:

- In alternate mode:
  - Read rotary encoder
  - Map encoder values to specific setpoints (10, 15, 20, 25)
  - Display selected temperature on OLED
- Check if the state of the mode button is pressed changed:
  - Display a message indicating switching to manual mode
  - Exit pre-saved values mode and enter manual mode

If the rotary encoder switch is pressed:

- Save the current temperature as the set temperature
- Initialize PID control variables (error, integral, etc.)
- Enter PID mode:
  - Continuously monitor and control temperature
  - Calculate the error between the current temperature and setpoint

- Apply the PID formula to calculate the output
- Update PWM duty cycle based on PID output
- Display current and set temperatures on OLED

If the rotary encoder switch is pressed again:

- Exit PID mode and return to pre-saved values mode

Short delay for loop stability

Catch KeyboardInterrupt:

- Exit main loop