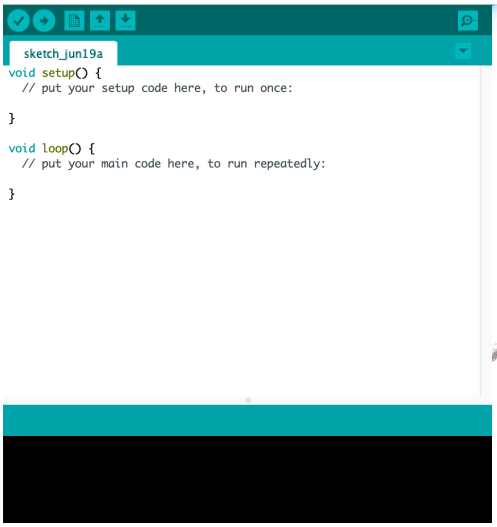
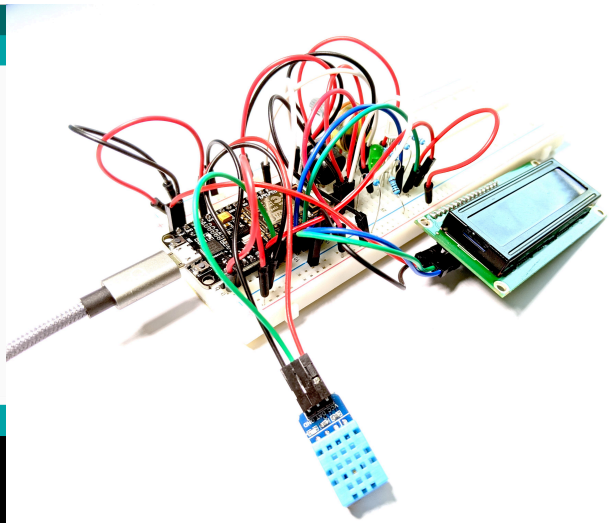
Smart Fridge

Part six: Automation

Project description:

You have now completed and written the code for the smart fridge project. In the process of assembling the circuit, you explored digital and analog components, learnt to output readings to the Serial Monitor, created a web server to push and read data, and automated some of the smart fridge functionalities. In this exercise, you will work on the existing smart fridge circuit and modify the code to change its behaviour. You can either come up with custom functionalities for your new smart fridge or follow the exercise template task.



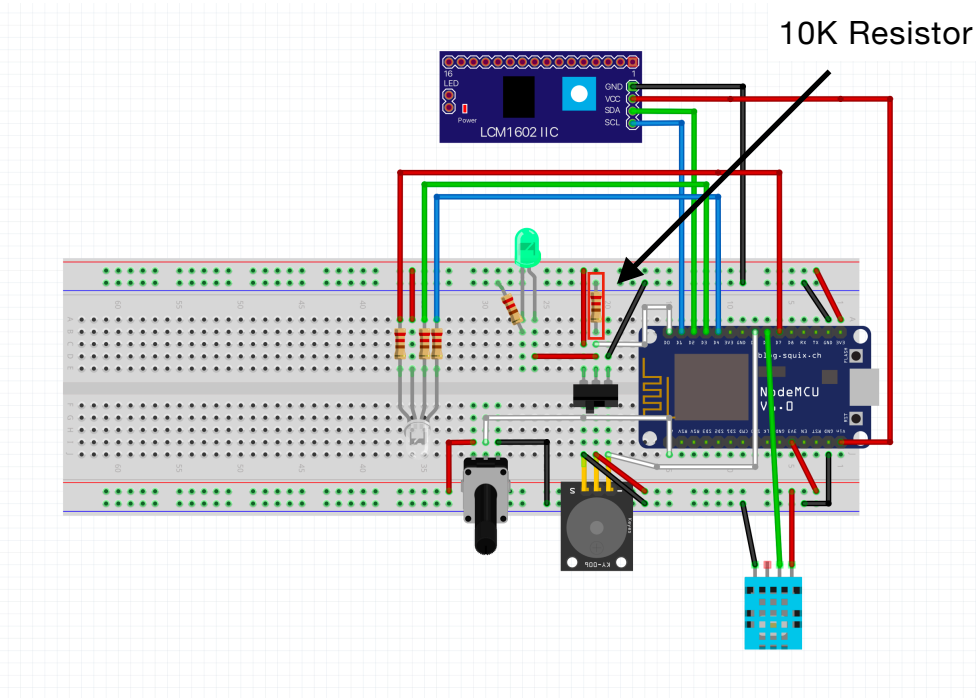


Project objectives:

- Change the smart fridge code to add different functionalities
- Add different automations to the smart fridge project

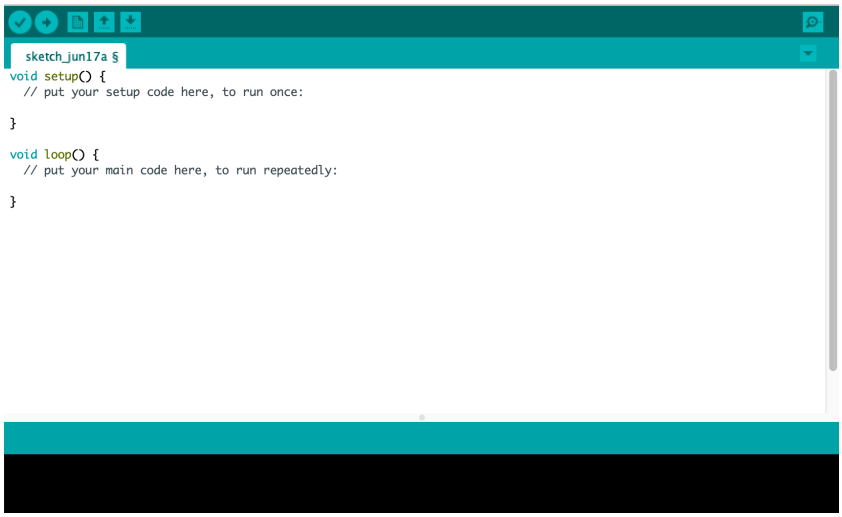
The Smart Fridge Automation
Exercise Specifications

You will work on the latest version of the smart fridge circuit:



Go ahead and create a new empty sketch from the Arduino IDE.

You should see an empty sketch like the following:



Feel free to save the sketch and rename it to something sensible:
smart_fridge_part6 for instance.

You can now either write the code to change the smart fridge behaviour according to your needs or write the code in the attempt to solve the following story riddle.

Riddle Title:

Andy and the Chilled Water

Riddle Background:

Andy is very keen on drinking plenty of water during the day. He lives in a seaside area and, during summer, the temperature reaches over 30 degrees. Andy has no issues sticking to his water intake during the colder months of the year, but he rigorously drinks refrigerated water in summer. Andy hates drinking room temperature water when the outside temperature exceeds 30 degrees but he has issues remembering to fill up his fridge with it.
Can you update the smart fridge code so that Andy remembers to refrigerate his water during the hottest days of the year?

Riddle Task:

You are expected to attempt the following:

- **Temperature**: Write the code to read the temperature from the DHT11 sensor.
- **Buzzer**: Write the code to activate the buzzer when the temperature exceeds 30 degrees. Only activate the buzzer for few seconds when the temperature exceeds 30 degrees. For the buzzer to send another signal, the temperature needs to first drop below 29 degrees. This will prevent Andy from hearing a constant buzz when the temperature exceeds 30 degrees.
- **LCD**: If the buzzer fails, Andy needs a visual backup to inform him that he might need to fill up the fridge with water bottles. Use the LCD screen to display three different messages: a welcome message, the temperature

reading from the DHT11 sensor, and a reminder to fill up the fridge with water only when the temperature exceeds 30 degrees.

- **Potentiometer**: Use the potentiometer as a controller to switch between the LCD messages.
  Hint: the potentiometer reads values in the range of 0 - 1024. You can map this value to a 1 - 3 range and use it to switch between the LCD messages.

Summary:

Write the code to help Andy solve his water habits. Once you update the smart fridge code, Andy should receive a buzzing signal when the temperature exceeds 30 degrees as a reminder for him to fill up the fridge with water. Furthermore, Andy should be able to use the potentiometer to switch between three different informative messages on the LCD screen: “Smart Fridge”, “The temperature is: 3”, and “Time to fill up the fridge”.

Additional Task
The smart chair automation

Go ahead and revisit the smart chair project. Can you think of a different automation process for such a circuit?

Check the circuit components and modify the code to com up with alternative ways to automate the smart chair project.