

R3-COOLER - DEMO #1

WEIGHT SENSING

CECS 490B SENIOR DESIGN
SPRING 2023



TEAM MEMBERS



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EXECUTIVE SUMMARY

- **NAME: "R3-COOLER"**
- **FEATURES:**
 - **COOLING TO KEEP THE DRINK COLD**
 - **AVOIDS OBSTACLES**
 - **REMOTE-CONTROLLED MOTORS**
 - **MONITOR BEVERAGE CONSUMPTION (QR SCANNER)**
 - **REFILL ALERT**
 - **LCD SCREEN**
- **EXTRA FEATURES IF TIME PERMITS:**
 - **BUILT-IN SPEAKER**
 - **GPS TRACKING**
 - **BREATHALYZER**



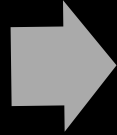
THIS PROJECT WILL ELIMINATE THE PROBLEM OF GUESTS RUMMAGING THROUGH YOUR FRIDGE TO FIND A DRINK AND IT WILL PAVE NEW WAYS TO ENTERTAIN/SHOW OFF TO YOUR GUESTS. WE ARE ALL LOOKING FORWARD TO PLANNING AND CREATING THIS PROJECT TO THE BEST OF OUR ABILITIES.

DEMO TIMELINE



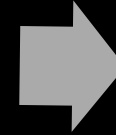
Weight Sensing

- Measures the weight of Cans inside the cooler
- Determines the amount of 12oz and 16oz cans in the cooler



Cooling System

- Reduces the temp within the cooler
- Monitors temp and automatically turns off when the desired temp is reached or vice versa.



Camera System

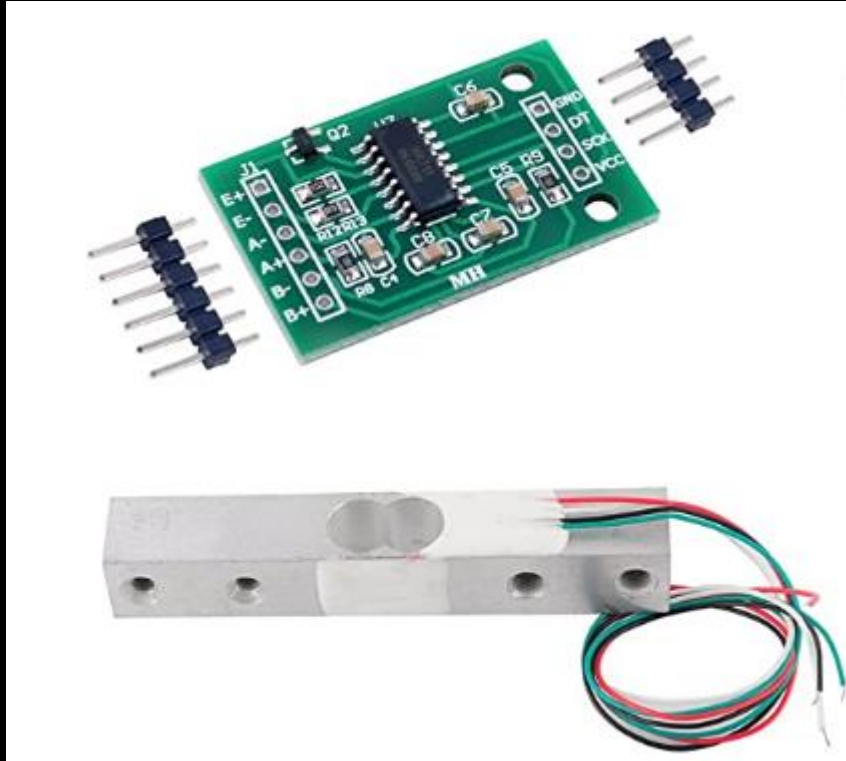
- Scans QR-codes
- Validates the QR-code
- Sends a message to the serial monitor if it's a valid QR-code

FIRST DEMO – WEIGHT SENSING

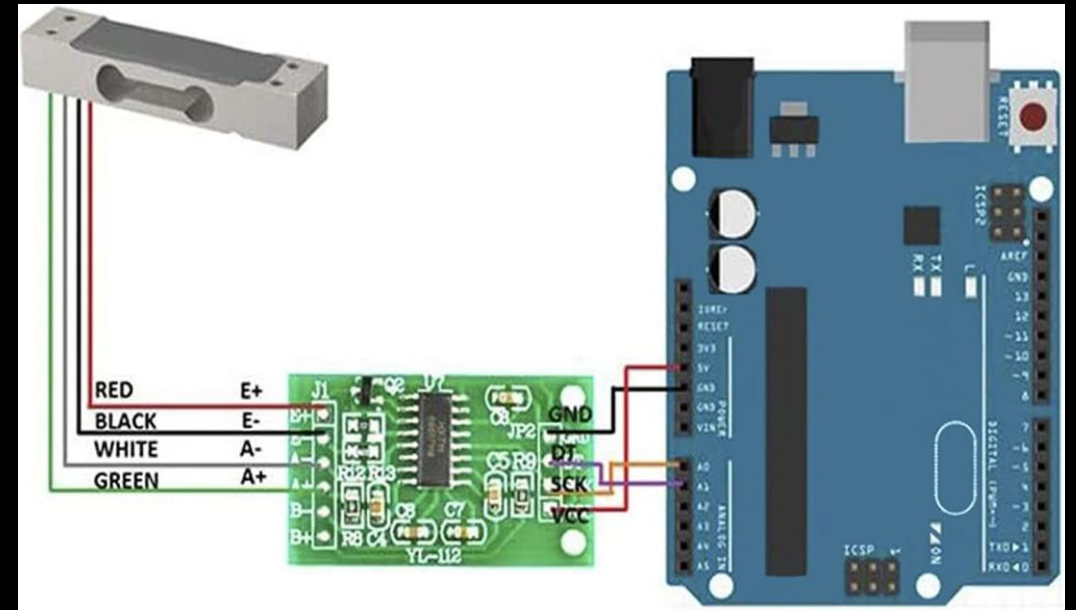
- WHAT WILL BE TESTED?
 - ACCURACY OF WEIGHT CALCULATION
 - CAPACITY OF 12 CANS
 - UPDATING WEIGHT INFORMATION
- HOW WILL IT BE TESTED?
 - 4 TOTAL TEST CASES
 - 12 TOTAL CANS ON THE SENSOR
 - REMOVAL OF 1 CAN
 - REMOVAL OF 4 CANS
 - REMOVAL OF ALL CANS
- HOW WILL WE KNOW IT WORKED?
 - TOTAL WEIGHT WAS CORRECTLY CALCULATED
 - ABLE TO UPDATE WEIGHT INFORMATION



SENSOR & BOARDS



20KG WEIGHT SENSOR



**WIRING TO BOARDS –
UNO R3**

MAXTRIX EXPLAINED

	0	1	2	3	4	5	6	7	8	9	10	11	12	# of 16oz cans
0	0	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11	12.1	13.2	
1	0.8	1.9	3	4.1	5.2	6.3	7.4	8.5	9.6	10.7	11.8	12.9		
2	1.6	2.7	3.8	4.9	6	7.1	8.2	9.3	10.4	11.5	12.6			
3	2.4	3.5	4.6	5.7	6.8	7.9	9	10.1	11.2	12.3				
4	3.2	4.3	5.4	6.5	7.6	8.7	9.8	10.9	12					
5	4	5.1	6.2	7.3	8.4	9.5	10.6	11.7						
6	4.8	5.9	7	8.1	9.2	10.3	11.4							
7	5.6	6.7	7.8	8.9	10	11.1								
8	6.4	7.5	8.6	9.7	10.8									
9	7.2	8.3	9.4	10.5										
10	8	9.1	10.2											
11	8.8	9.9												
12	9.6													
# of 12oz cans														
														Weight in pounds "-1" used to indicate more than 12 cans

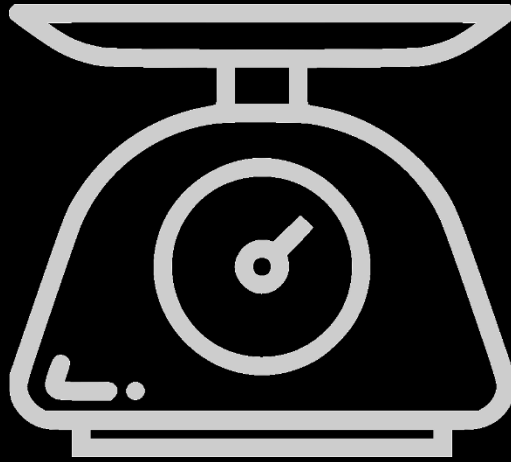
CODE

```
50
51 void loop() {
52     B = round(scale.get_units()/0.925);
53     D = (scale.get_units());
54     float x1 = (float)D*10;
55     x1 = x1 + 0.5;
56     int y = (int)x1;
57     float D = (float)y/10.0;
58     if(B == 0 & A == 1) {
59         Serial.print("0"); //scale.get_units() returns a float
60         Serial.print(" lbs"); //You can change this to kg but you'll need to refactor the calibration_factor
61         Serial.println();
62         Serial.print("No drinks, refill needed");
63         Serial.println();
64         A = 0;
65         C = 0;
66     }
67     if(B >= 1 & B != C) {
68         if(D == E[1][0] or D == E[0][1]){
69             drinks = 1;
70         }
71         else if(D == E[2][0] or D == E[0][2] or D == E[1][1]){
72             drinks = 2;
73         }
74     }
```


LIVE DEMO

CHECKLIST

- ☐ CASE #1: CALCULATE THE WEIGHT OF 12 CANS
- ☐ CASE #2: 1 CAN REMOVED (12OZ AND 16OZ)
- ☐ CASE #3: 4 CANS REMOVED
- ☐ CASE #4: NO CANS, REFILL



CHALLENGES ENCOUNTERED

- A CHALLENGE THAT TOOK A GREAT DEAL AMOUNT OF TIME WAS FIGURING OUT THE PLACEMENT OF THE SCREWS INTO THE PLATFORM AND THE WEIGHT SENSOR.
- DETERMINING THAT ONE 20KG WEIGHT SENSOR PLACED IN THE MIDDLE WAS MUCH BETTER THAN FOUR 5KG WEIGHT SENSORS DISPLACED AROUND THE PLATFORM.
- UNDERSTANDING AND CREATING A MATRIX FOR THE COOLER TO HOLD BOTH 12OZ AND 16OZ CANS.



NEXT DEMO – COOLING SYSTEM

- **WHAT'S NEXT?**
 - **SHOW STANDARD TEMPERATURE**
 - **REACH DESIRED TEMPERATURE BY COOLING TO <45 DEGREES**
 - **BEING ABLE TO MAINTAIN THAT TEMPERATURE AND SELF-CORRECT**



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