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IDE Coffee Maker - CoffeeMaker_FinalProject_SHeck/Core/Src/main.c - STM32CubeIDE
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P X C S T
main.c MX CoffeeMaker_FinalProject_SHeck.ioc startup_stm32l475vgtx.s
10 * All rights reserved.</center></h2>
11 *
12 * This software component is licensed by ST under BSD 3-Clause license,
13 * the "License"; You may not use this file except in compliance with the
14 * License. You may obtain a copy of the License at:
15 * opensource.org/licenses/BSD-3-Clause
16 ****
17 */
18 */
19/* USER CODE END Header */
20/* Includes -----*/
21#include "main.h"
22
23/* Private includes -----*/
24/* USER CODE BEGIN Includes */
25#include "stm32l4xx_hal.h"
26#include "stm32l475e_iot01_tsensor.h"
27#include "string.h"
28/* USER CODE END Includes */
29
30/* Private typedef -----*/
31/* USER CODE BEGIN PTD */
32
33/* USER CODE END PTD */
34
35/* Private define -----*/
36/* USER CODE BEGIN PD */
37/* USER CODE END PD */
38
39/* Private macro -----*/
40/* USER CODE BEGIN PM */
41
42/* USER CODE END PM */
43
44/* Private variables -----*/
45ADC_HandleTypeDef hadc1;
46
47DFSDM_Channel_HandleTypeDef hdfsdm1_channel1;
48
49I2C_HandleTypeDef hi2c2;
50
51QSPI_HandleTypeDef hqspi;
52
53SPI_HandleTypeDef hspi3;
54
55UART_HandleTypeDef huart1;
56UART_HandleTypeDef huart3;
57
58PCD_HandleTypeDef hpcd_USB_OTG_FS;
59
60/* USER CODE BEGIN PV */
```

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main.c [CoffeeMaker_FinalProject_SHeck.ioc] startup_stm32l475vgtx.s

```
118 MX_USB_OTG_FS_PCD_Init();  
119 MX_ADC1_Init();  
120  
121 /* USER CODE BEGIN 2 */  
122 int powerButton;  
123 int LED2State;  
124 int powerDownTimer;  
125 int powerDown_BTN;  
126 int extraStrengthButton;  
127 int extraStrengthLED;  
128 int autoOffBTN;  
129 int autoOffLED;  
130 int XL_BTN;  
131 int L_BTN;  
132 int M_BTN;  
133 int S_BTN;  
134 int halResult;  
135 int adcResult;  
136 float waterTemp;  
137 char *brew = "BREWING BEGAN\n";  
138 char *done = "BREWING COMPLETE\n";  
139 char *xstrength = "EXTRA STRENGTH SELECTED\n";  
140 char *normal = "NORMAL STRENGTH SELECTED\n";  
141 int index = 0;  
142 int xStronglen = strlen (xstrength);  
143 int brewlen = strlen (brew);  
144 int doneLEN = strlen (done);  
145 int normalLEN = strlen (normal);  
146  
147 //char lowWater[15] = "Water Level Low";  
148 // uint32_t adcWaterLevel;  
149 // HAL_StatusTypeDef halWaterLevel;  
150  
151 powerButton = 0;  
152 LED2State = 0;  
153 autoOffBTN = 0;  
154 autoOffLED = 0;  
155 powerDownTimer = 0;  
156 powerDown_BTN = 0;  
157 extraStrengthButton = 0;  
158 extraStrengthLED = 0;  
159 XL_BTN = 0;  
160 L_BTN = 0;  
161 M_BTN = 0;  
162 S_BTN = 0;  
163 halResult = 0;  
164 adcResult = 0;  
165 waterTemp = 0.0;  
166 /* USER CODE END 2 */  
167  
168 /* Infinite loop */  
169 /* USER CODE BEGIN WHILE */
```

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main.c [CoffeeMaker_FinalProject_SHeck.ioc] startup_stm32475vgtx.s

```
170     BSP_TSSENSOR_Init();
171     while (1)
172     {
173         /*
174             * Use User button from board as Power
175             User LED2 from board as Power
176             1. Press button
177                 a. Power on
178                     i. Set variable
179                     b. LED2 comes on
180             2. Press button
181                 a. Power off
182                     i. Set variable
183                     b. LED2 goes off
184             */
185
186         //Power the coffee maker up for the morning
187         powerButton = BSP_PB_GetState(BUTTON_EXTI13_Pin);
188
189         if (powerButton == 0) {
190
191             BSP_LED_On(LED2_Pin);
192             LED2State = 1;
193             HAL_Delay(250);
194         }
195
196         //Power the coffee maker down
197         powerButton = BSP_PB_GetState(BUTTON_EXTI13_Pin);
198
199         if (powerButton == 0 && LED2State == 1) {
200             power_off(LED2State);
201         }
202
203         //Make a Strong Brew cup
204         extraStrengthButton = HAL_GPIO_ReadPin(Extra_Strength_BTN_GPIO_Port, Extra_Strength_BTN_Pin);
205
206         if (extraStrengthButton == 1)
207         {
208             HAL_GPIO_WritePin(Extra_Strength_LED_GPIO_Port, Extra_Strength_LED_Pin, 1);
209             extraStrengthLED = 1;
210             HAL_Delay(250);
211             HAL_UART_Transmit(&huart1, (uint8_t *) &xstrength[index], 1, 0);
212             index++;
213
214             if (index == xStronglen)
215             {
216                 index = 0;
217             }
218             HAL_Delay(10);
219         }
220     }
221 }
```

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main.c CoffeeMaker_FinalProject_SHeck.ioc startup_stm32f475vgtx.s

```
221 //Make a Normal Brew cup
222 extraStrengthButton = HAL_GPIO_ReadPin(Extra_Strength_BTN_GPIO_Port, Extra_Strength_BTN_Pin);
223
224 if (extraStrengthButton == 1 && extraStrengthLED == 1)
225 {
226     HAL_GPIO_WritePin(Extra_Strength_LED_GPIO_Port, Extra_Strength_LED_Pin, 0);
227     extraStrengthLED = 0;
228     HAL_Delay(250);
229     HAL_UART_Transmit(&huart1, (uint8_t *) &normal[index], 1, 0);
230         index++;
231
232         if (index == normallen)
233         {
234             index = 0;
235         }
236         HAL_Delay(10);
237 }
238
239 //Make 12 Ounce cup
240 XL_BTN = HAL_GPIO_ReadPin(xlButton_GPIO_Port, xlButton_Pin);
241
242 if (XL_BTN == 1)
243 {
244     HAL_GPIO_WritePin(xlLED_GPIO_Port, xlLED_Pin, 1);
245     HAL_UART_Transmit(&huart1, (uint8_t *) &brew[index], 1, 0);
246         index++;
247
248         if (index == brewlen)
249         {
250             index = 0;
251         }
252         HAL_Delay(10);
253
254     HAL_Delay(12000);
255     HAL_GPIO_WritePin(xlLED_GPIO_Port, xlLED_Pin, 0);
256     XL_BTN = 0;
257     powerDownTimer = 0;
258     HAL_UART_Transmit(&huart1, (uint8_t *) &done[index], 1, 0);
259         index++;
260
261         if (index == doneLen)
262         {
263             index = 0;
264         }
265         HAL_Delay(10);
266 }
267
268 //Make 10 Ounce cup
269 L_BTN = HAL_GPIO_ReadPin(largeButton_GPIO_Port, largeButton_Pin);
270
271 if (L_BTN == 1)
272 {
```

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main.c [MX] CoffeeMaker_FinalProject_SCheck.ioc [S] startup_stm32l475vgtx.s

```
268     //Make 10 Ounce cup
269     L_BTN = HAL_GPIO_ReadPin(largeButton_GPIO_Port, largeButton_Pin);
270
271     if (L_BTN == 1)
272     {
273         HAL_GPIO_WritePin(largeLED_GPIO_Port, largeLED_Pin, 1);
274         HAL_UART_Transmit(&huart1, (uint8_t *) &brew[index], 1, 0);
275             index++;
276
277             if (index == brewlen)
278             {
279                 index = 0;
280             }
281             HAL_Delay(10);
282
283             HAL_GPIO_WritePin(largeLED_GPIO_Port, largeLED_Pin, 0);
284             L_BTN = 0;
285             powerDownTimer = 0;
286             HAL_UART_Transmit(&huart1, (uint8_t *) &done[index], 1, 0);
287                 index++;
288
289             if (index == doneLEN)
290             {
291                 index = 0;
292             }
293             HAL_Delay(10);
294
295     }
296
297     //Make 8 Ounce cup
298     M_BTN = HAL_GPIO_ReadPin(medButton_GPIO_Port, medButton_Pin);
299
300     if (M_BTN == 1)
301     {
302         HAL_GPIO_WritePin(medButton_GPIO_Port, medLED_Pin, 1);
303         HAL_UART_Transmit(&huart1, (uint8_t *) &brew[index], 1, 0);
304             index++;
305
306             if (index == brewlen)
307             {
308                 index = 0;
309             }
310             HAL_Delay(10);
311
312             HAL_GPIO_WritePin(medLED_GPIO_Port, medLED_Pin, 0);
313             M_BTN = 0;
314             powerDownTimer = 0;
315             HAL_UART_Transmit(&huart1, (uint8_t *) &done[index], 1, 0);
316                 index++;
317
318             if (index == doneLEN)
319             {
```

MX_C MX_D MX_I MX_C MX_S MX_L MX_A power Error assert

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main.c x CoffeeMaker_FinalProject_SHeck.ioc startup_stm32475vgtx.s

```
320 } HAL_Delay(10);
321 }
322 }
323 //Make 6 Ounce cup
324 S_BTN = HAL_GPIO_ReadPin(smallButton_GPIO_Port, smallButton_Pin);
325
326 if (S_BTN == 1)
327 {
328     HAL_GPIO_WritePin(smallLED_GPIO_Port, smallLED_Pin, 1);
329     HAL_UART_Transmit(&huart1, (uint8_t *) &brew[index], 1, 0);
330     index++;
331
332         if (index == brewlen)
333         {
334             index = 0;
335         }
336         HAL_Delay(10);
337
338     HAL_Delay(6000);
339     HAL_GPIO_WritePin(smallLED_GPIO_Port, smallLED_Pin, 0);
340     S_BTN = 0;
341     powerDownTimer = 0;
342     HAL_UART_Transmit(&huart1, (uint8_t *) &done[index], 1, 0);
343     index++;
344
345         if (index == doneLen)
346         {
347             index = 0;
348         }
349         HAL_Delay(10);
350 }
351
352 //Check water level
353 HAL_ADC_Start_IT(&hadc1);
354 halResult = HAL_ADC_PollForConversion(&hadc1, 100);
355 adcResult = HAL_ADC_GetValue(&hadc1);
356 if (adcResult >= 1934)
357 {
358     HAL_GPIO_WritePin(Low_Water_LED_GPIO_Port, Low_Water_LED_Pin, 1);
359     HAL_GPIO_WritePin(xLEDD_GPIO_Port, xLEDD_Pin, 0);
360     HAL_GPIO_WritePin(xLLEDD_GPIO_Port, xLLEDD_Pin, 0);
361     HAL_GPIO_WritePin(medLEDD_GPIO_Port, medLEDD_Pin, 0);
362     HAL_GPIO_WritePin(smallLED_GPIO_Port, smallLED_Pin, 0);
363 }
364 else if(adcResult < 1934)
365 {
366     HAL_GPIO_WritePin(Low_Water_LED_GPIO_Port, Low_Water_LED_Pin, 0);
367 }
368
369 //auto-off
370 powerDown_BTN = HAL_GPIO_ReadPin(autoOffBTN_GPIO_Port, autoOffBTN_Pin);
```

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351 //Check water level
352 HAL_ADC_Start_IT(&hadc1);
353 halResult = HAL_ADC_PollForConversion(&hadc1, 100);
354 adcResult = HAL_ADC_GetValue(&hadc1);
355 if (adcResult >= 1934)
{
    HAL_GPIO_WritePin(Low_Water_LED_GPIO_Port, Low_Water_LED_Pin, 1);
    HAL_GPIO_WritePin(xlLED_GPIO_Port, xlLED_Pin, 0);
    HAL_GPIO_WritePin(xlLED_GPIO_Port, xlLED_Pin, 0);
    HAL_GPIO_WritePin(medLED_GPIO_Port, medLED_Pin, 0);
    HAL_GPIO_WritePin(smallLED_GPIO_Port, smallLED_Pin, 0);
}
else if(adcResult < 1934)
{
    HAL_GPIO_WritePin(Low_Water_LED_GPIO_Port, Low_Water_LED_Pin, 0);
}

//auto-off
powerDown_BTN = HAL_GPIO_ReadPin(autoOffBTN_GPIO_Port,autoOffBTN_Pin );
if (powerDown_BTN == 1)
{
    HAL_GPIO_WritePin(Auto_Off_LED_GPIO_Port, Auto_Off_LED_Pin, 1);
    autoOffLED = 1;
    powerDownTimer = HAL_GetTick();
    powerDown_BTN = 0;
    HAL_Delay(250);
    if (powerDownTimer == 50000)
    {
        power_off(LED2State);
    }
}
powerDown_BTN = HAL_GPIO_ReadPin(autoOffBTN_GPIO_Port,autoOffBTN_Pin );
if (powerDown_BTN == 1 && autoOffLED == 1)
    {HAL_GPIO_WritePin(Auto_Off_LED_GPIO_Port, Auto_Off_LED_Pin, 0);
autoOffLED = 0;
    HAL_Delay (250);}
```

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main.c

```

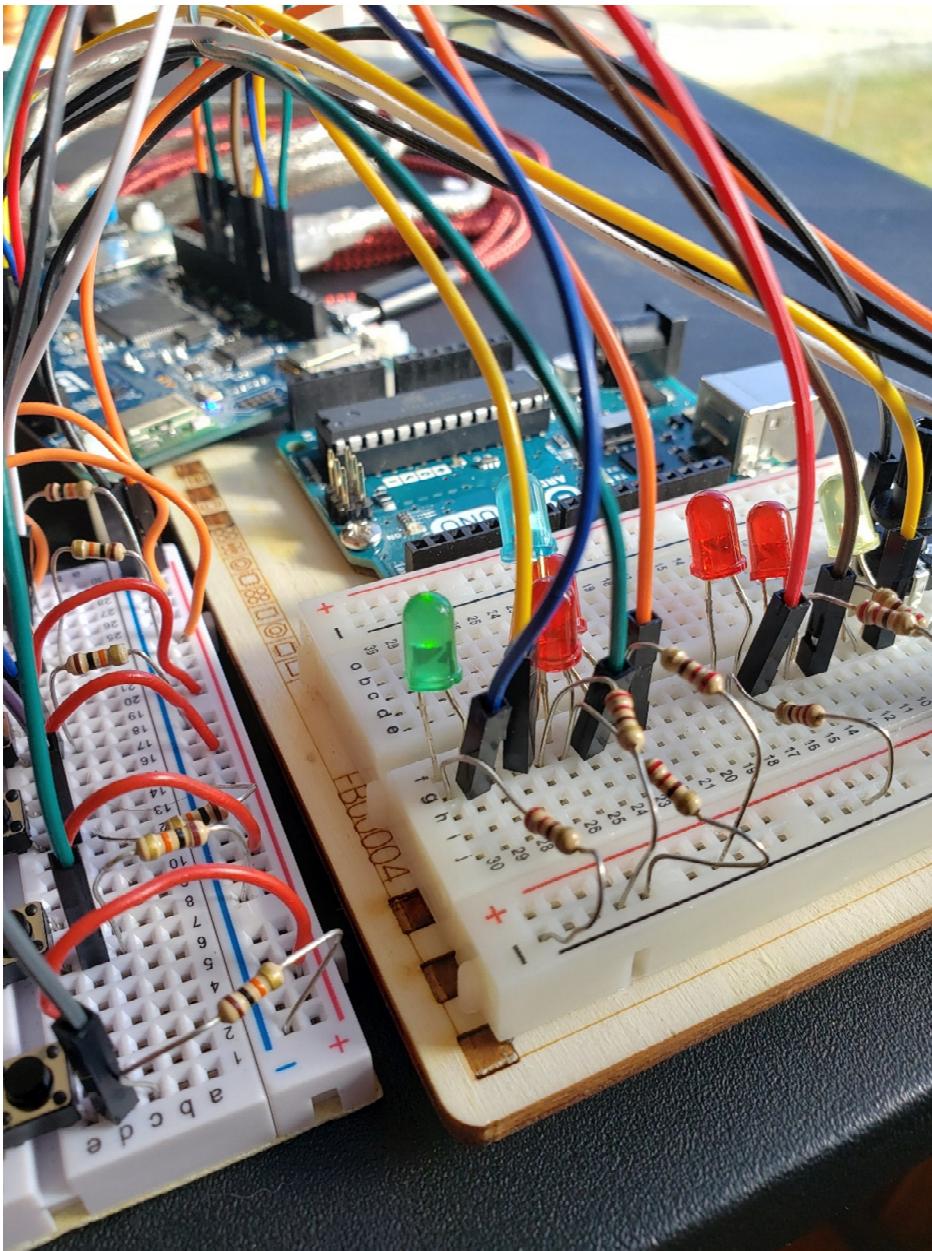
954     GPIO_InitStruct.Pull = GPIO_PULLUP;
955     GPIO_InitStruct.Speed = GPIO_SPEED_FREQ_VERY_HIGH;
956     GPIO_InitStruct.Alternate = GPIO_AF4_I2C1;
957     HAL_GPIO_Init(ARD_D15_GPIO_Port, &GPIO_InitStruct);
958 
959     /* EXTI interrupt init*/
960     HAL_NVIC_SetPriority(EXTI9_5_IRQn, 0, 0);
961     HAL_NVIC_EnableIRQ(EXTI9_5_IRQn);
962 
963     HAL_NVIC_SetPriority(EXTI15_10_IRQn, 0, 0);
964     HAL_NVIC_EnableIRQ(EXTI15_10_IRQn);
965 }
966 
967 /* USER CODE BEGIN 4 */
968 void power_off(int LED2State)
969 {
970     BSP_LED_Off(LED2);
971     LED2State = 0;
972     HAL_Delay(1000);
973     HAL_GPIO_WritePin(Extra_Strength_LED_GPIO_Port, Extra_Strength_LED_Pin, 0);
974     HAL_GPIO_WritePin(xlLED_GPIO_Port, xlLED_Pin, 0);
975     HAL_GPIO_WritePin(largeLED_GPIO_Port, largeLED_Pin, 0);
976     HAL_GPIO_WritePin(medLED_GPIO_Port, medLED_Pin, 0);
977     HAL_GPIO_WritePin(smallLED_GPIO_Port, smallLED_Pin, 0);
978     HAL_GPIO_WritePin(Auto_Off_LED_GPIO_Port, Auto_Off_LED_Pin, 0);
979 }
980 
981 /* USER CODE END 4 */
982 
983 /**
984 * @brief This function is executed in case of error occurrence.
985 * @retval None
986 */
987 void Error_Handler(void)
988 {
989     /* USER CODE BEGIN Error_Handler_Debug */
990     /* User can add his own implementation to report the HAL error return state */
991     __disable_irq();
992     while (1)
993     {
994     }
995     /* USER CODE END Error_Handler_Debug */
996 }
997 
998 #ifdef USE_FULL_ASSERT
999 /**
1000 * @brief Reports the name of the source file and the source line number
1001 * where the assert_param error has occurred.
1002 * @param file: pointer to the source file name
1003 * @param line: assert_param error line source number
1004 * @retval None

```

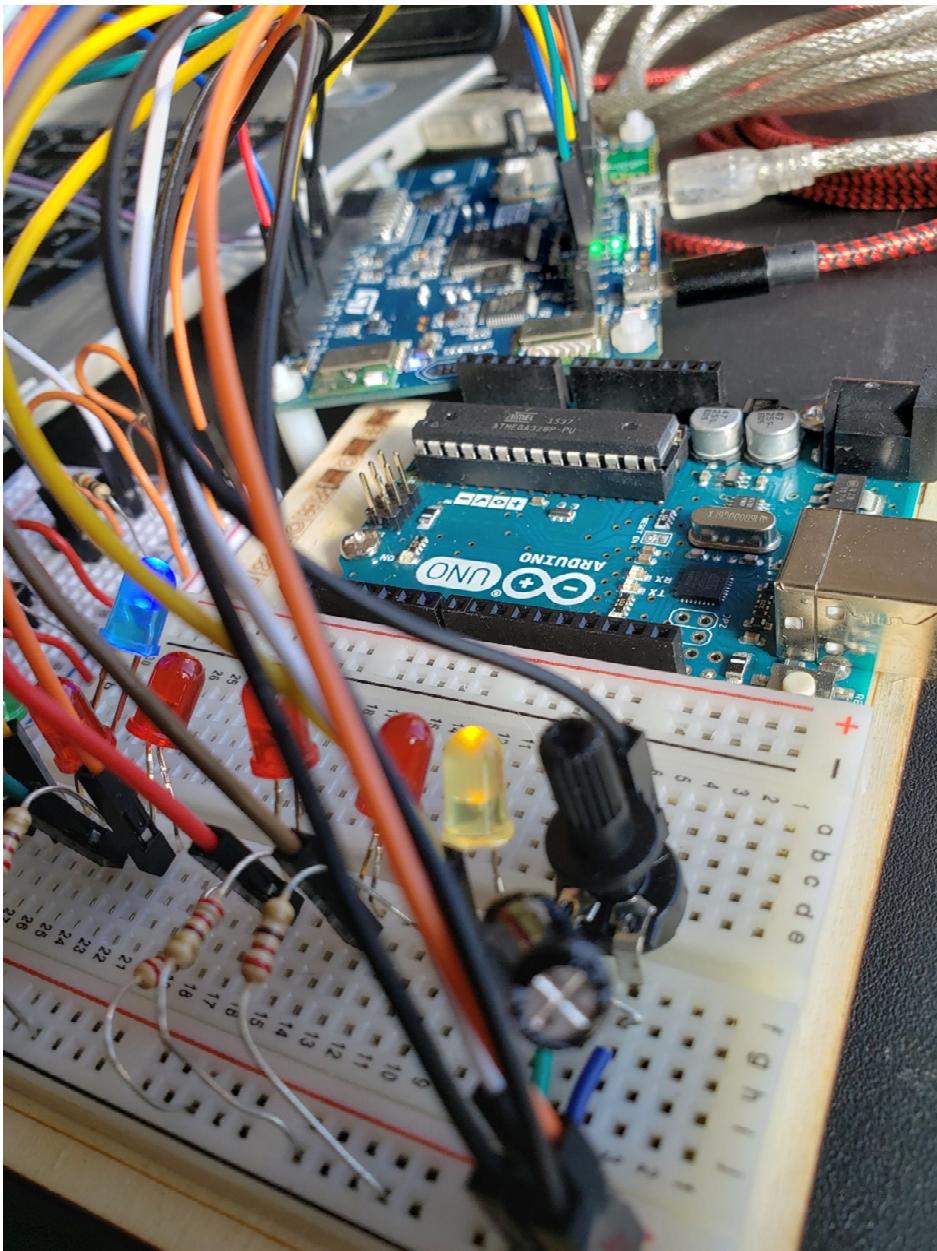
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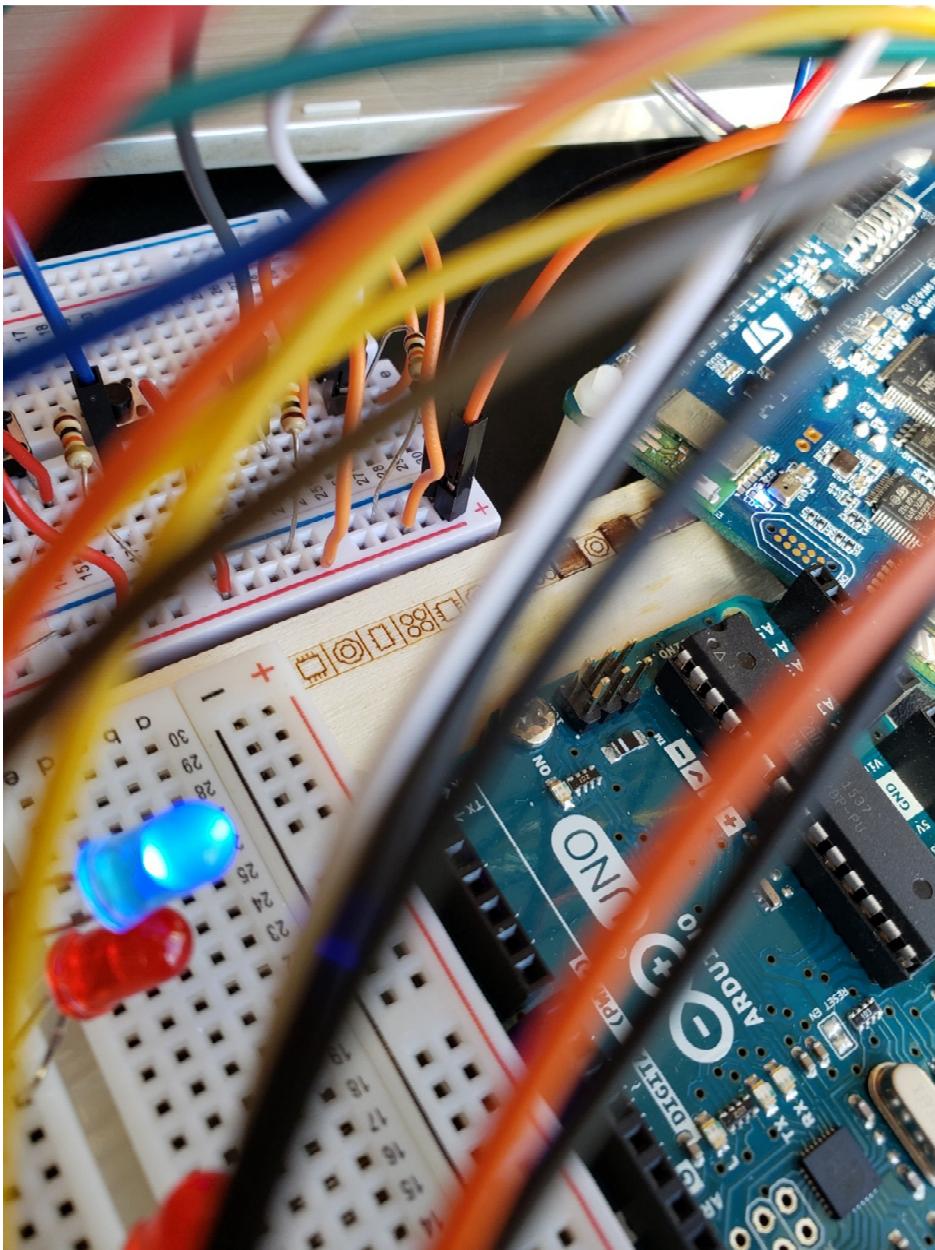
Auto Off (Green) LED



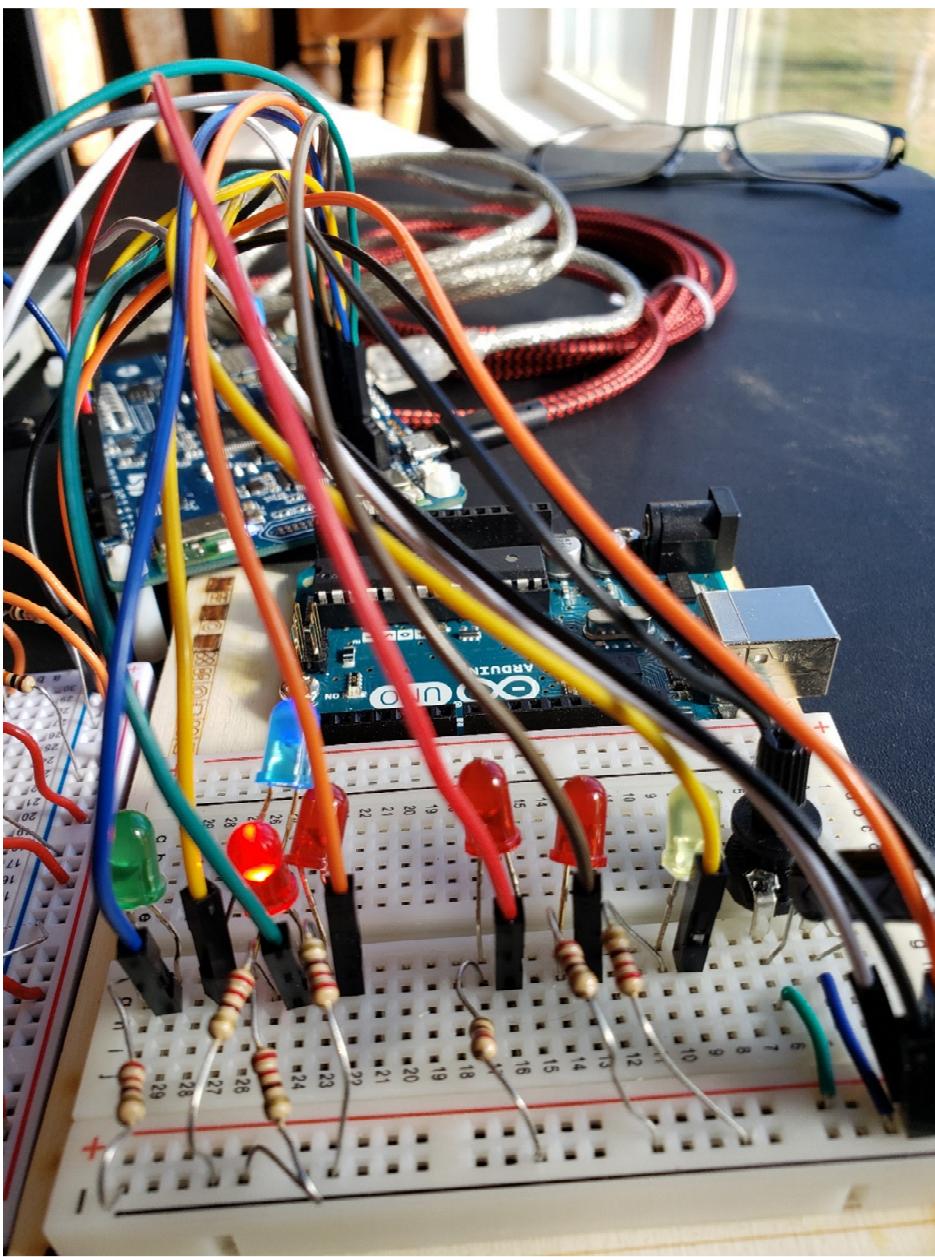
Low Water



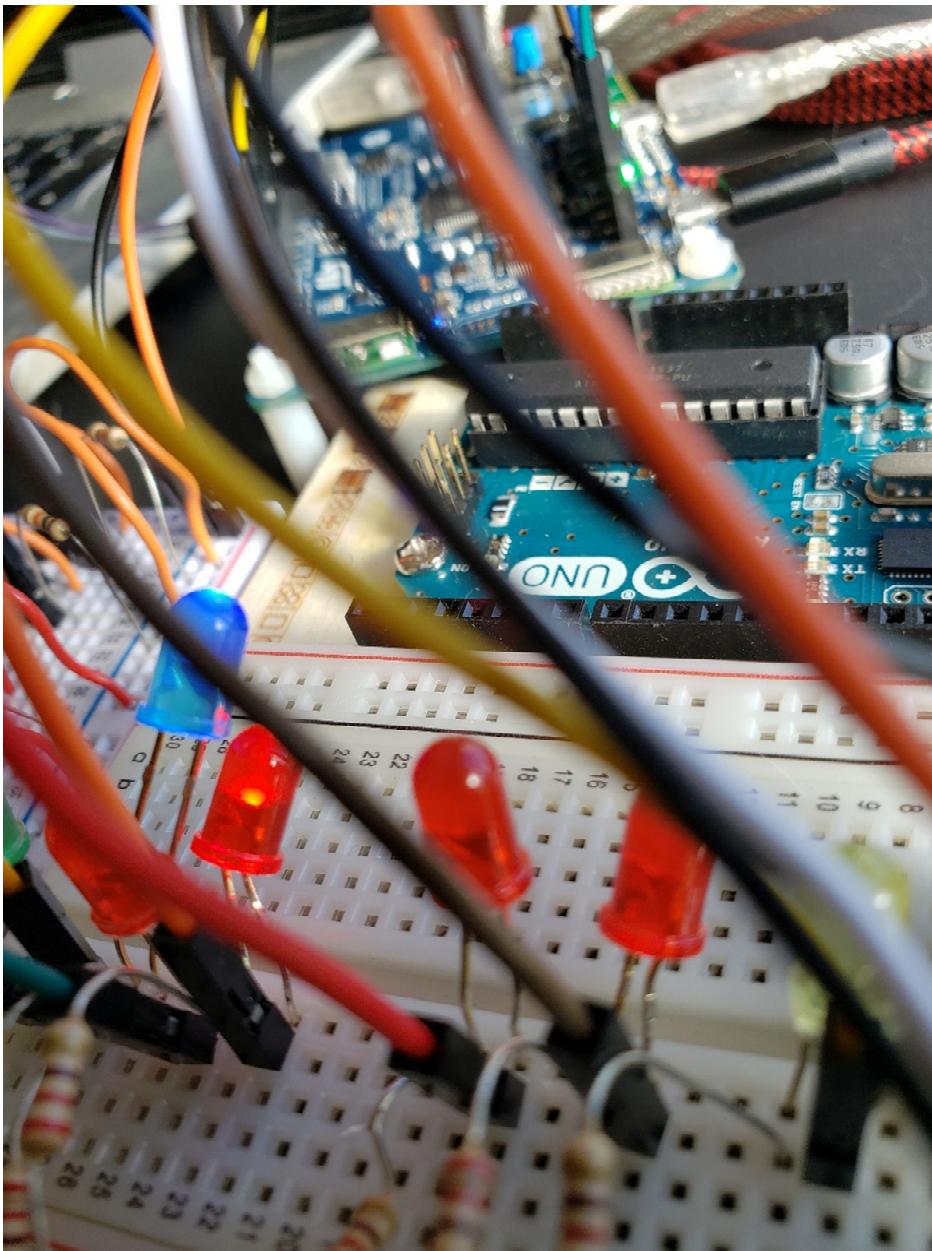
Strong Brew



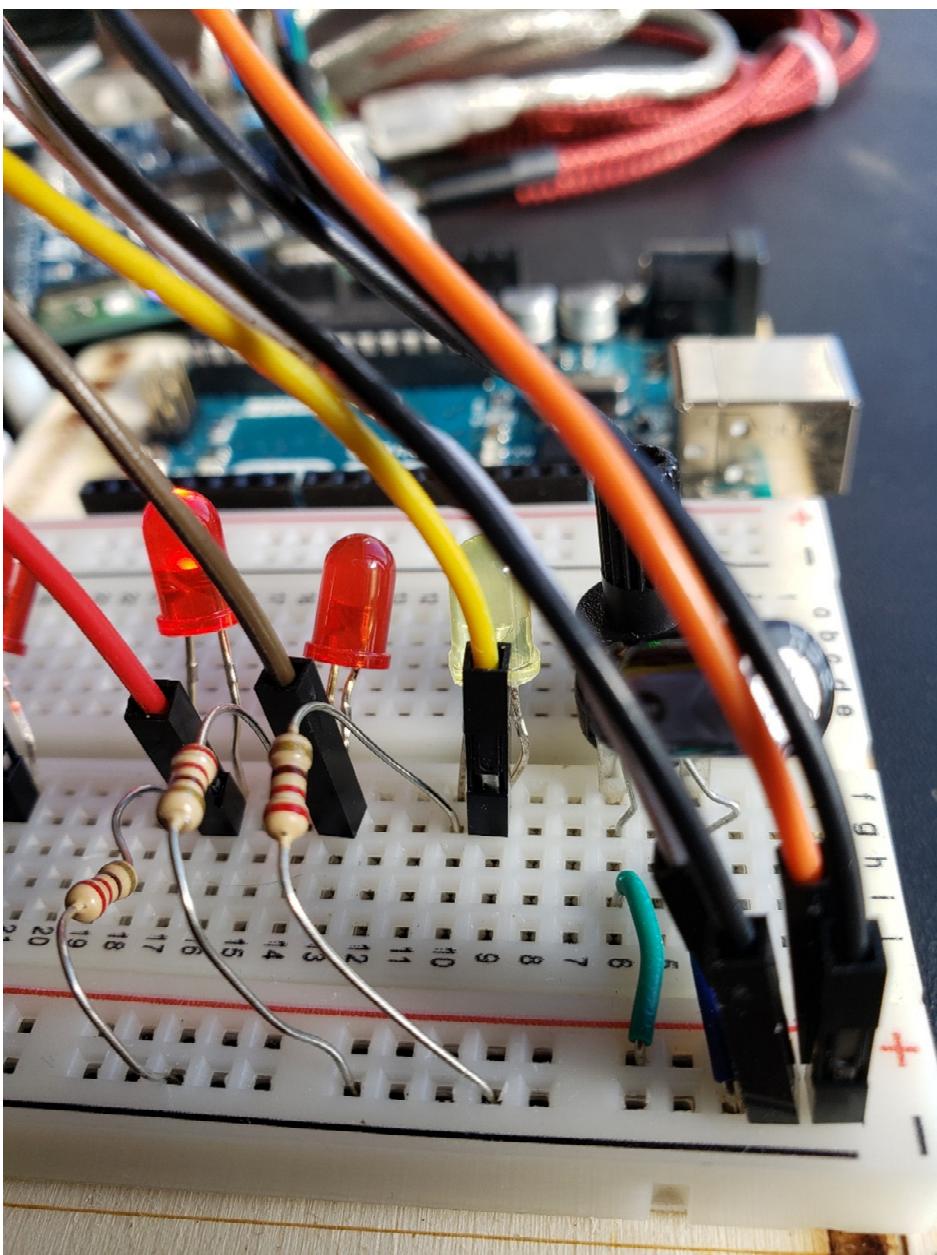
XL Cup



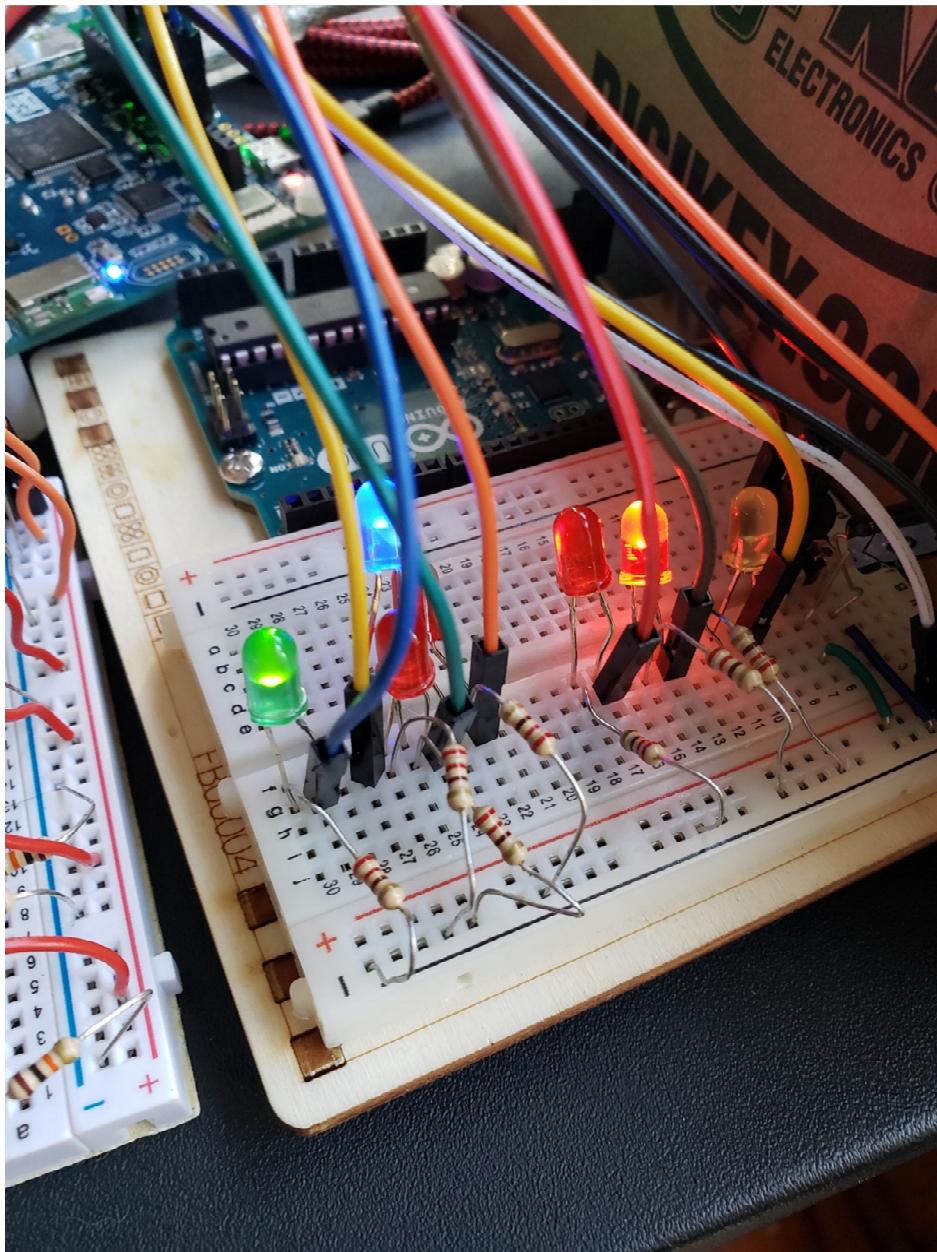
Large Cup



Medium Cup



Small Cup (Red) Auto Off (Green)



Power On

