

```

1 //Anexo B
2
3 /* Programa: Regação Automatizado V.1
4
5 Autor : Luiz Filipe
6 Data: 22/08/2019
7
8 Esta versão beta tem por objetivo analisar primeiramente o horario, no caso 8:00:00
9 horas e 17:00:00 horas,
10 neste horario será feita a medição do solo que irá verificar se há necessidade ou
11 não de ligar o relé e acionar a
12 valvula.
13 */
14
15 /** Incluindo Bibliotecas **/
16 #include "Wire.h"
17 #define DS1307_ADDRESS 0x68
18 byte zero = 0x00;
19
20 #include <LiquidCrystal_I2C.h> //Carrega a biblioteca LCD
21 LiquidCrystal_I2C lcd(0x3F,16,2); //Define os pinos que serão ligados ao LCD
22
23 #define pino_sinal_analogico A0
24 #define pino_led_vermelho 5
25 #define pino_led_amarelo 6
26 #define pino_led_verde 7
27
28 int valor_analogico;
29
30 int pino_rele = 2;
31 boolean ligado = true;
32
33 void setup() {
34     Wire.begin();
35     Serial.begin(9600);
36     setDateTime(); //Necessário configurar na função "setDateTime()"
37
38     lcd.init();
39     // Print a message to the LCD.
40     lcd.backlight();
41     lcd.setCursor(0,0);
42     lcd.begin(16, 2);
43     lcd.clear();
44     Serial.begin(9600);
45
46     lcd.setCursor(0,0);
47     lcd.print("Seja Bem Vindo");
48
49     lcd.setCursor(0,1);
50     lcd.print("Luiz Filipe");
51
52     delay(2000);
53
54     pinMode(pino_sinal_analogico, INPUT);
55     pinMode(pino_led_vermelho, OUTPUT);
56     pinMode(pino_led_amarelo, OUTPUT);
57     pinMode(pino_led_verde, OUTPUT);
58
59     pinMode(pino_rele, OUTPUT);
60     digitalWrite(2, HIGH);
61 }
62
63 void loop() {
64     printDate();
65     delay(1000);
66     Mostrarelogio();
67     delay(1000);
68     Mostrarelogio();
69     delay(1000);
70     Mostrarelogio();
71     delay(1000);
72
73     Stateleds();

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72     delay(2000);
73
74     King();
75     delay(100);
76
77 }
78
79 void setDateTime() {
80
81     byte segundo =      00;  //0-59
82     byte minuto  =      30;  //0-59
83     byte hora    =      14;  //0-23
84     byte diasemana =      5;  //1-7
85     byte dia     =      25;  //1-31
86     byte mes     =       8;  //1-12
87     byte ano     =      19;  //0-99
88
89     Wire.beginTransmission(DS1307_ADDRESS);
90     Wire.write(zero);
91
92     Wire.write(decToBcd(segundo));
93     Wire.write(decToBcd(minuto));
94     Wire.write(decToBcd(hora));
95     Wire.write(decToBcd(diasemana));
96     Wire.write(decToBcd(dia));
97     Wire.write(decToBcd(mes));
98     Wire.write(decToBcd(ano));
99
100    Wire.write(zero);
101
102    Wire.endTransmission();
103
104 }
105
106 byte decToBcd(byte val) {
107     // Conversão de decimal para binário
108     return ( (val/10*16) + (val%10) );
109 }
110
111 byte bcdToDec(byte val) {
112     // Conversão de binário para decimal
113     return ( (val/16*10) + (val%16) );
114 }
115
116 void printDate() {
117
118     Wire.beginTransmission(DS1307_ADDRESS);
119     Wire.write(zero);
120     Wire.endTransmission();
121
122     Wire.requestFrom(DS1307_ADDRESS, 7);
123
124     int segundo = bcdToDec(Wire.read());
125     int minuto  = bcdToDec(Wire.read());
126     int hora    = bcdToDec(Wire.read() & 0b111111); //Formato 24 horas
127     int diasemana = bcdToDec(Wire.read());           //0-6 -> Domingo - Sábado
128     int dia     = bcdToDec(Wire.read());
129     int mes     = bcdToDec(Wire.read());
130     int ano     = bcdToDec(Wire.read());
131
132     //Exibe a data e hora. Ex.:   3/12/13 19:00:00
133
134     Serial.print(dia);
135     Serial.print("/");
136     Serial.print(mes);
137     Serial.print("/");
138     Serial.print(ano);
139     Serial.print(" ");
140     Serial.print(hora);
141     Serial.print(":");
142     Serial.print(minuto);
143     Serial.print(":");
144     Serial.println(segundo);

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145
146 }
147
148 void Mostrarelogio()
149 {
150     Wire.beginTransaction(DS1307_ADDRESS);
151     Wire.write(zero);
152     Wire.endTransmission();
153
154     Wire.requestFrom(DS1307_ADDRESS, 7);
155
156     int segundo = bcdToDec(Wire.read());
157     int minuto = bcdToDec(Wire.read());
158     int hora = bcdToDec(Wire.read() & 0b111111); //Formato 24 horas
159     int diasemana = bcdToDec(Wire.read()); //0-6 -> Domingo - Sábado
160     int dia = bcdToDec(Wire.read());
161     int mes = bcdToDec(Wire.read());
162     int ano = bcdToDec(Wire.read());
163
164     // Imprime mensagem na primeira linha do display
165
166     // Mostra a hora atual no display
167
168     lcd.clear();
169
170     lcd.setCursor(0, 0);
171
172     //Mostra o dia da semana no display
173     switch(diasemana)
174     {
175     case 0:lcd.print("Dom-");
176     break;
177     case 1:lcd.print("Seg-");
178     break;
179     case 2:lcd.print("Ter-");
180     break;
181     case 3:lcd.print("Qua-");
182     break;
183     case 4:lcd.print("Qui-");
184     break;
185     case 5:lcd.print("Sex-");
186     break;
187     case 6:lcd.print("Sab-");
188     }
189
190     // Mostra a data atual no display
191     if (dia < 10)
192     {lcd.print("0");}
193     lcd.print(dia);
194     lcd.print(".");
195
196     if (mes < 10)
197     {lcd.print("0");}
198     lcd.print(mes);
199     lcd.print(".");
200     lcd.print(ano);
201
202     lcd.setCursor(0,1);
203
204     if (hora < 10)
205     {lcd.print("0");}
206     lcd.print(hora);
207     lcd.print(":");
208
209     if (minuto < 10)
210     {lcd.print("0");}
211     lcd.print(minuto);
212     lcd.print(":");
213
214     if (segundo < 10)
215     {lcd.print("0");}
216     lcd.print(segundo);
217 }

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218
219 void apagaleds()
220 {
221     digitalWrite(pino_led_vermelho, LOW);
222     digitalWrite(pino_led_amarelo, LOW);
223     digitalWrite(pino_led_verde, LOW);
224 }
225
226 void piscaled()
227 {
228     // wait for a second
229     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
230     delay(1000);
231     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
232     delay(1000); // wait for a second
233     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
234     delay(1000);
235     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
236     delay(1000); // wait for a second
237     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
238     delay(1000);
239     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
240     delay(1000); // wait for a second
241     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
242     delay(1000);
243     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
244     delay(1000); // wait for a second
245     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
246     delay(1000);
247     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
248     delay(1000); // wait for a second
249     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
250     delay(1000);
251     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
252     delay(1000); // wait for a second
253     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
254     delay(1000);
255     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
256     delay(1000); // wait for a second
257     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
258     delay(1000);
259     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
260     delay(1000); // wait for a second
261     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
262     delay(1000);
263     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
264     delay(1000); // wait for a second
265     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
266     delay(1000);
267     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
268     delay(1000); // wait for a second
269     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
270     delay(1000);
271     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
272     delay(1000); // wait for a second
273     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
274     delay(1000);
275     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
276     delay(1000); // wait for a second
277     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
278     delay(1000);
279     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
280     delay(1000); // wait for a second
281     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
282     delay(1000);
283     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage level)
284     delay(1000); // wait for a second
285     digitalWrite(pino_led_verde, LOW); // turn the LED off by making the voltage LOW
286     delay(1000);
287     digitalWrite(pino_led_verde, HIGH); // turn the LED on (HIGH is the voltage
        level)
288     delay(1000);
289 }

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```

290
291 void Stateleds(){
292     lcd.clear();
293     lcd.setCursor(0, 0);
294     //Le o valor do pino A0 do sensor
295     valor_analogico = analogRead(pino_sinal_analogico);
296
297     //Mostra o valor da porta analogica no serial monitor
298     Serial.print("Porta analogica: ");
299     Serial.print(valor_analogico);
300
301     lcd.print("Valor: ");
302     lcd.print(valor_analogico);
303
304     //Solo umido, acende o led verde
305     if (valor_analogico > 0 && valor_analogico < 400)
306     {
307         Serial.println(" Status: Solo umido");
308         apagaleds();
309         digitalWrite(pino_led_verde, HIGH);
310
311         lcd.setCursor(0, 1);
312         lcd.print("Status: Umido");
313     }
314
315     //Solo com umidade moderada, acende led amarelo
316     if (valor_analogico > 400 && valor_analogico < 800)
317     {
318         Serial.println(" Status: Umidade moderada");
319         apagaleds();
320         digitalWrite(pino_led_amarelo, HIGH);
321
322         lcd.setCursor(0, 1);
323         lcd.print("Status: Moderado");
324     }
325
326     //Solo seco, acende led vermelho
327     if (valor_analogico > 800 && valor_analogico < 1024)
328     {
329         Serial.println("Status: Seco");
330         apagaleds();
331         digitalWrite(pino_led_vermelho, HIGH);
332
333         lcd.setCursor(0, 1);
334         lcd.print("Status: Solo Seco");
335     }
336 }
337
338 void King()
339 {
340     Wire.beginTransmission(DS1307_ADDRESS);
341     Wire.write(zero);
342     Wire.endTransmission();
343
344     Wire.requestFrom(DS1307_ADDRESS, 7);
345
346     int segundo = bcdToDec(Wire.read());
347     int minuto = bcdToDec(Wire.read());
348     int hora = bcdToDec(Wire.read() & 0b111111); //Formato 24 horas
349     int diasemana = bcdToDec(Wire.read()); //0-6 -> Domingo - Sábado
350     int dia = bcdToDec(Wire.read());
351     int mes = bcdToDec(Wire.read());
352     int ano = bcdToDec(Wire.read());
353     if (((hora == 8)&&(minuto == 0))||((hora == 17)&&(minuto == 0)))
354     {
355         if (valor_analogico > 800 && valor_analogico < 1024)
356         {
357             lcd.clear();
358             lcd.setCursor(0, 0);
359             lcd.print("Molhando... Por");
360             lcd.setCursor(0, 1);
361             lcd.print("favor aguarde!");
362

```

```
363         digitalWrite(pino_rele, LOW);
364         Serial.println("Rele 1 Ligado");
365         ligado = false;
366
367         apagaleds();
368         piscaled();           // Incrementa contador em uma unidade.
369
370
371         /* delay(30000); */
372
373         digitalWrite(pino_rele, HIGH);
374         Serial.println("Rele 1 Desligado");
375         ligado = true;
376     }
377
378 }
379 }
```