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'Parking7 - English Version - November 2024 Update - Marc DANIEL
#Region Project Attributes
    #AutoFlushLogs: True
    #CheckArrayBounds: True
    #StackBufferSize: 300
#End Region

' MANAGEMENT OF A PARKING MODEL OF 14 SPACES, 3 of which are FREE at the start of the program
 ' ARDUINO MEGA2560 CARD + Servomotor + LCD screen (4 lines of 20 characters) and its I2C interface
' With an Arduino MEGA 2560 board you will need To connect the SDA pin of the I2C interface To the SDA1 pin of the Arduino MEGA 2560 board And the SCL pin To the SCL1 pin
' (If you use an Arduino UNO board, the SDA pin of the I2C interface is connected to analog pin A4 and the SCL pin is connected to analog pin A5.)

Sub Process_Globals
    Public Serial1 As Serial
    Private pinGreenLED, pinYellowLED, pinRedLED As Pin 'pins for traffic Light
    Private pinBlueLED, pinWhiteLED As Pin ' pins for LEDs
    Private pinButtonEnter As Pin
    Private pinButtonExit As Pin
    Private PinBuzzer As Pin
    Public GreenLED = False As Boolean
    Public Places As UInt
    Public Lock As Boolean
    Public Movement As Boolean
    Private LCD As LiquidCrystal_I2C      'Library "rLiquidCrystal_I2C" to load and use
    Private Barrier As Servo              'Library "rServo" to load and use
    End Sub

Private Sub AppStart
    Serial1.Initialize(115200)
    pinButtonEnter.Initialize(pinButtonEnter.A0, pinButtonExit.MODE_INPUT_PULLUP)   'Enter Button
    pinButtonEnter.AddListener("pinButtonEnter_StateChanged")
    pinButtonExit.Initialize(pinButtonExit.A1, pinButtonExit.MODE_INPUT_PULLUP)   'Exit Button
    pinButtonExit.AddListener("pinButtonExit_StateChanged")
    pinGreenLED.Initialize(7, pinGreenLED.MODE_OUTPUT)                                  ' Green Lights
    pinYellowLED.Initialize(4,pinYellowLED.MODE_OUTPUT)
    ' Yellow light
    pinRedLED.Initialize(5, pinRedLED.MODE_OUTPUT)
    pinBlueLED.Initialize(12,pinBlueLED    .MODE_OUTPUT)
    pinWhiteLED.Initialize(11,pinWhiteLED.MODE_OUTPUT)                          ' Red lights
    PinBuzzer.Initialize(3,PinBuzzer.MODE_OUTPUT)                                       ' Buzzer
    Barrier.Attach2(9,0,190) ' Display at address "0x27"
    'Be careful, the red wire of the servomotor must be connected to the VIN pin of the Arduino card and especially not to a 5 Volt terminal of the card
    LCD.Initialize(0x27, 20, 4) ' Initialization of the LCD screen with 4 lines of 20 characters
    'Arduino pins SCL and SDA reserved for connecting the LCD pins SCL and SDA
    Places=3 '3 parking spaces are available
    ' You can modify line 44 if you wish to change the number of places available at the
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start of the program
46      Lock=False
47      CallSubPlus("Departure", 0,0)
48  End Sub
49
50  Private Sub Departure
51      pinGreenLED.DigitalWrite(True)   'lights the green LED at the start of the session or ↵
in the event of RESET on the ARDUINO UNO card (3 places remain defined on line 44)
52      LCD.Backlight = True
53      LCD.Clear
54      LCD.SetCursor(0,0)
55      LCD.Write("  CENTRAL PARKING  ")
56      LCD.SetCursor(3,1)
57      LCD.Write(NumberFormat(Places,2,0))
58      LCD.SetCursor(5,1)
59      LCD.Write(" FREE PLACES  ")
60      LCD.SetCursor(0,2)
61      LCD.Write("       WELCOME    ")
62      LCD.SetCursor(0,3)
63      LCD.Write("                    ")
64      Barrier.Read
65      If Barrier.Read <> 0 Then Barrier.Write(0)
66  End Sub
67
68  Private Sub pinButtonEnter_StateChanged(State1 As Boolean)
69      Movement = True
70      If State1 = False Then
71          If Lock=False Then
72              If Places > 0 Then
73                  pinGreenLED.DigitalWrite(True)  'lights up the green LED (there are      ↵
places left)
74                  ' NB: The green LED will be lit by default at the start because there are ↵
3 free places
75                  pinRedLED.DigitalWrite(False) 'turns off the Red LED (The parking lot is ↵
no longer full)
76                  pinBlueLED.DigitalWrite(True) 'Light up the blue LED  = Entry of a       ↵
vehicle
77                  Lock=True'Momentarily locks the use of the ENTER (or EXIT) button
78                  CallSubPlus("Buzzer",0,0)
79                  CallSubPlus("Opening",500,0) 'Opening the barrier
80                  LCD.SetCursor(0,3)
81                  LCD.Write(" INCOMING  VEHICLE ")
82                  CallSubPlus("Break",5150,0) 'Vehicle movement
83                  CallSubPlus("Closing", 10300, 0) ' Closing the barrier
84                  CallSubPlus("EndEntrance",14850,0) ' End of closing the barrier
85                  LCD.SetCursor(0,2)
86                  LCD.Write("                    ")
87                  CallSubPlus("Unlock",15300,0)
88                  Places = Places -1
89                  CallSubPlus("SpaceManagement",0,0)
90
91              End If
92          End If
93      End If
94  End Sub
95
96  Private Sub pinButtonExit_StateChanged(State2 As Boolean)
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97      Movement = False
98      If State2 = False Then
99          If Lock=False Then
100             If Places <> 14  Then
101                 pinGreenLED.DigitalWrite(True)  'light up the green LED (there are Places left)
102                 pinRedLED.DigitalWrite(False) 'turns off the Red LED
103                 pinWhiteLED.DigitalWrite(True) ' light up the white LED = Exiting a vehicle
104                 Lock=True ' Momentarily blocks the use of the EXIT (or ENTER) button
105                 CallSubPlus("Opening",500,0)'Opening the barrier
106                 CallSubPlus("Break",5150,0)
107                 'Vehicle movement
108                 CallSubPlus("Closing", 10300, 0) ' Closing the barrier
109                 CallSubPlus("EndOfExit",14850,0) ' End of closing the barrier
110                 CallSubPlus("Unlock",15300,0)
111             End If
112             If Places < 14 Then Places = Places + 1
113             CallSubPlus("SpaceManagement",0,0)
114         End If
115     End If
116 End Sub
117
118 Private Sub Buzzer(Tag As Byte)
119     PinBuzzer.DigitalWrite(True)  'Activates the buzzer after pressing the Enter button
120     Delay (500)
121     PinBuzzer.DigitalWrite(False)  'Turn off the buzzer
122 End Sub
123
124 Private Sub Opening(Tag As Byte)
125     For i = 0 To 110
126     Delay(20)
127         Barrier.Write(i) ' opens the barrier for entry or exit of a vehicle
128     Next
129     LCD.SetCursor(0,3)
130     If Movement = True And Places > 0  Then  LCD.Write("  INCOMING VEHICLE  ")
131     If Movement = False Then  LCD.Write("  EXITING  VEHICLE  ")
132 End Sub
133
134 Private Sub Break(Tag As Byte)
135     'Barrier remains open - Movement of vehicle entering or exiting
136 End Sub
137
138 Private Sub Closing(Tag As Byte)
139     For i= 110 To 0 Step -1
140         Delay(20)
141     Barrier.Write(i) 'closing the barrier
142     Next
143 End Sub
144
145 Private Sub EndEntrance '(Tag As Byte)
146     pinBlueLED.DigitalWrite(False)    'Turns off the blue LED - End of vehicle entry
147     LCD.SetCursor(0,3)
148     If Places > 0 Then LCD.Write("                    ")
149 End Sub
150
151 Private Sub EndOfExit(Tag As Byte)
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152     'End of barrier closure
153     pinWhiteLED.DigitalWrite(False)   'turns off the White LED = End of a vehicle exit
154     LCD.SetCursor(0,3)
155     LCD.Write("                    ")
156 End Sub
157 
158 Private Sub SpaceManagement(Tag As Byte)
159     Select Places
160         Case 0
161             pinRedLED.DigitalWrite(True) 'Lights up the red LED (full parking lot 0 free space)
162             pinGreenLED.DigitalWrite(False) 'turns off the Green LED
163             pinYellowLED.DigitalWrite(False)  'turns off the yellow LED
164             LCD.Clear
165             LCD.SetCursor(0,0)
166             LCD.Write("    FULL PARKING  ")
167             LCD.SetCursor(3, 1)
168             LCD.Write(NumberFormat(Places, 1, 0))
169             LCD.SetCursor(5,1)
170             LCD.Write(" FREE PLACE ")
171             LCD.SetCursor(0,2)
172             LCD.Write("   Wait for a car ")
173             LCD.SetCursor(0,3)
174             LCD.Write("    to come out   ")
175 
176         Case 1
177             pinGreenLED.DigitalWrite(True)  'Green LED on
178             pinYellowLED.DigitalWrite(True)'There is only one place left, the yellow light comes on
179             LCD.Clear
180             LCD.SetCursor(0,0)
181             LCD.Write("  CENTRAL PARKING  ")
182             LCD.SetCursor(3,1)
183             LCD.Write(NumberFormat(Places,2,0))
184             LCD.SetCursor(5,1)
185             LCD.Write(" FREE PLACE  ")
186             LCD.SetCursor(0,2)
187             LCD.Write("       WELCOME   ")
188             LCD.SetCursor(0,3)
189             LCD.Write("                    ")
190 
191         Case Else ' 2 to 14 free places
192             pinRedLED.DigitalWrite(False) ' turns off the red LED
193             pinYellowLED.DigitalWrite(False) ' turns off the yellow LED
194             pinGreenLED.DigitalWrite(True)  ' lights up the green LED
195             LCD.Clear
196             LCD.SetCursor(0,0)
197             LCD.Write("  CENTRAL PARKING  ")
198             LCD.SetCursor(3,1)
199             LCD.Write(NumberFormat(Places,2,0))
200             LCD.SetCursor(5,1)
201             LCD.Write(" FREE PLACES  ")
202             LCD.SetCursor(0,2)
203             LCD.Write("       WELCOME   ")
204             LCD.SetCursor(0,3)
205             LCD.Write("                    ")
206 
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207
208     End Select
209 End Sub
210
211 Private Sub Unlock(Tag As Byte) ' Unlocks the ENTRANCE and EXIT buttons
212     'As long as the blue LED or white LED remains lit, the input and output buttons are
    disabled
213     Lock=False
214 End Sub
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