egypt fwd initiative

UDACITY

10/9/2022

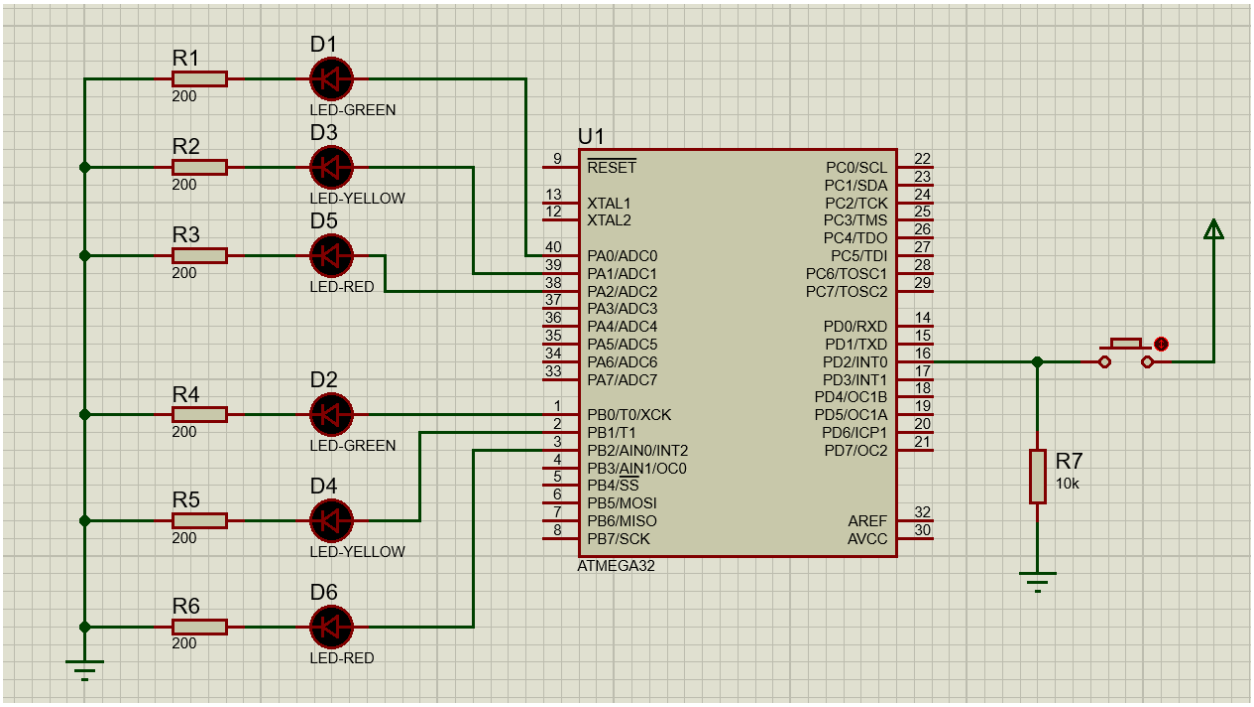
On-demand Traffic Light control

Khaled Tarek

Table of content:

1. System description

1. 1 system overview



2. 1 system functionality

The system can detect when the button is pressed. Afterwards, based on current state it would decide what to do. It allows pedestrians to walk by making sure cars are stopped first.

2.System design

1.1 Hardware requirements

- AVR Atemga32
- 2 Res LED$_s$
- 2 Yellow LED$_s$
- 2 Green LED$_s$
- Resistance 10 k Ω & 6x 200 Ω
- Push button

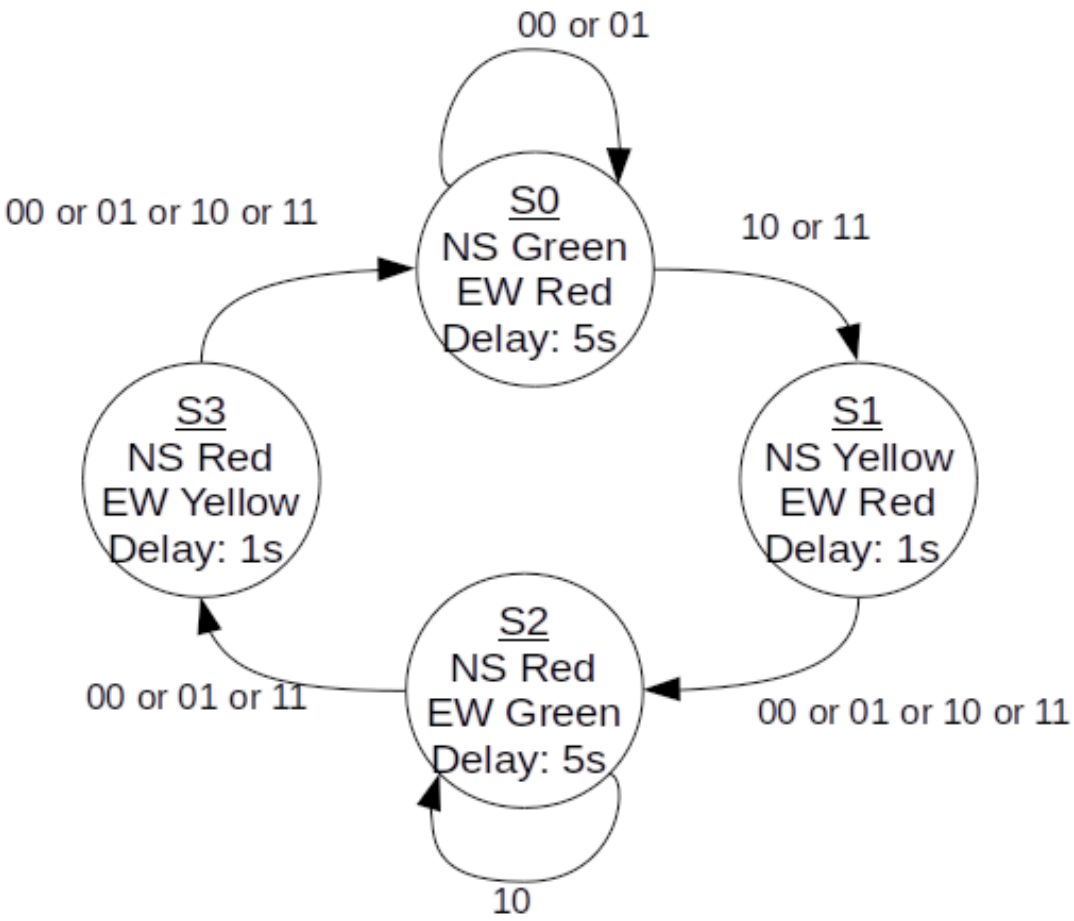
1.2 Simulation requirements

Proetus license.

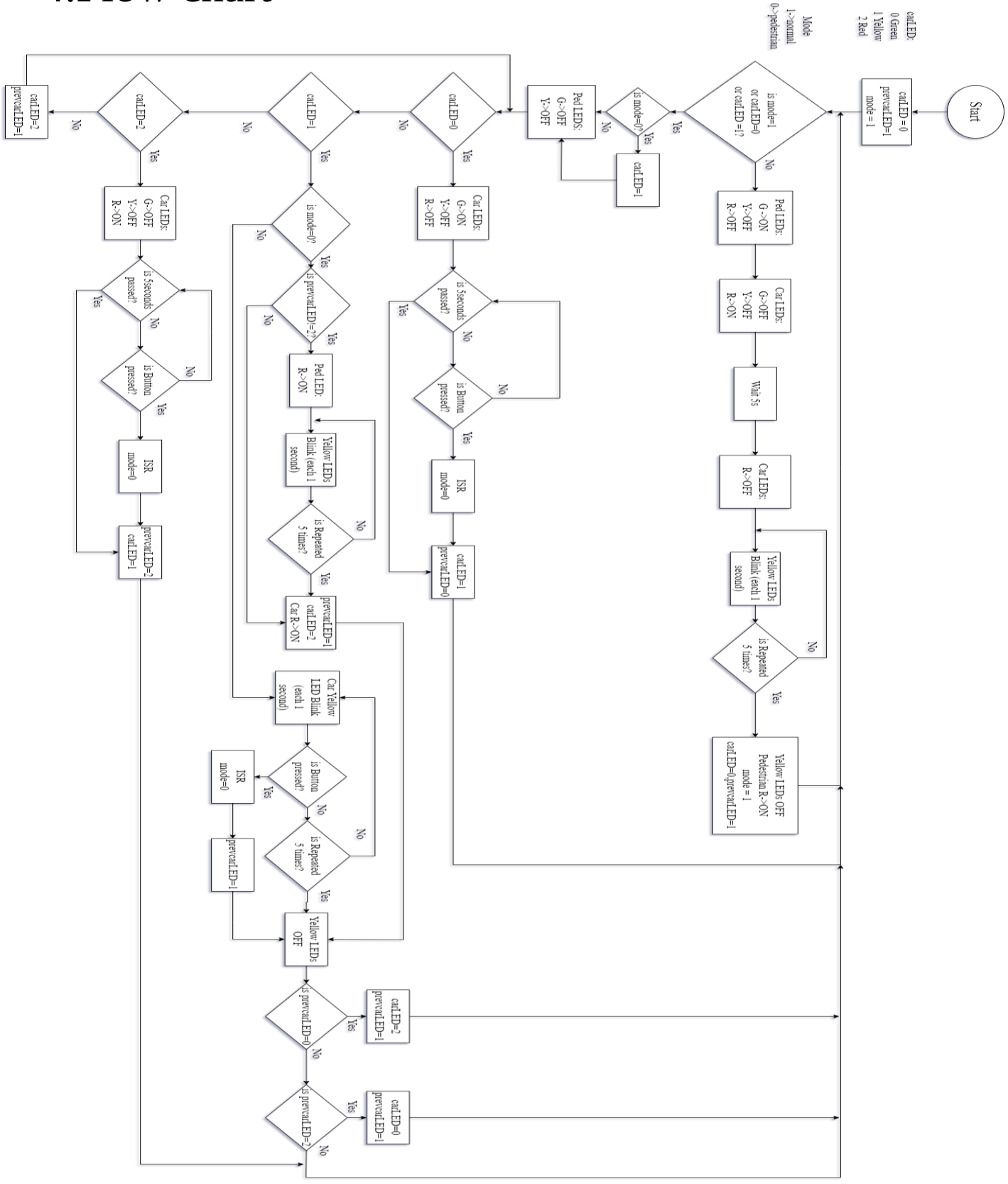
1.3 Input & Output format

The only system input is in the form of the pedestrian push button. When it comes to output it handles 6 LEDs at once given the current state, time and push button press.

3.State machine



4.Flow chart


Start
carLED = 0
prevcarLED=1
mode = 1
carLED:
0 Green
1 Yellow
2 Red
Mode
1->normal
0->pedestrian
is mode=1
or carLED =1?
Yes
No
Ped LEDs:
G->ON
Y->OFF
R->OFF
Car LEDs:
G->OFF
Y->OFF
R->ON
Wait 5s
Car LEDs:
R->OFF
Yellow LEDs
Blink (each 1
second)
is Repeated
5 times?
No
Yes
Yellow LEDs OFF
Pedestrian R->ON
mode = 1
carLED=0;prevcarLED=1
is mode=0?
Yes
No
carLED=1
Ped LEDs:
G->OFF
Y->OFF
carLED=0
Car LEDs:
G->ON
Y->OFF
R->OFF
is Seconds
passed?
No
Yes
is Button
pressed?
No
Yes
ISR
mode=0
carLED=1
prevcarLED=0
carLED=1
Ped LED:
R->ON
Yellow LEDs
Blink (each 1
second)
is Repeated
5 times?
No
Yes
prevcarLED=1
carLED=2
Car R->ON
Car Yellow
LED Blink
(each 1
second)
is Button
pressed?
No
Yes
ISR
mode=0
prevcarLED=1
is Repeated
5 times?
No
Yes
Yellow LEDs
OFF
is prevcarLED=0
Yes
No
carLED=2
prevcarLED=1
is prevcarLED=2
Yes
No
carLED=0
prevcarLED=1
carLED=2
Car LEDs:
G->OFF
Y->OFF
R->ON
is Seconds
passed?
No
Yes
is Button
pressed?
No
Yes
ISR
mode=0
prevcarLED=2
carLED=1
carLED=1
prevcarLED=1