Traffic Signal Management

`http://`

Traffic Management System

Global Configuration

Direction :   Select Direction ▾

Clock Wise
Anti Clock Wise
Up - Down
Right - Left

Interval :   input the time interval (In seconds)

Save/Update

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Traffic Analyzer

< Settings

Time :   Automatic timer (starts from zero to Interval)

Current Open: Display Current open signal

Next Open :   Display Next open signal

Direction: Display selected direction

AA

A

AD   D   B   AB

C

AC

Remaining Time :   Automatic timer (starts interval to zero)
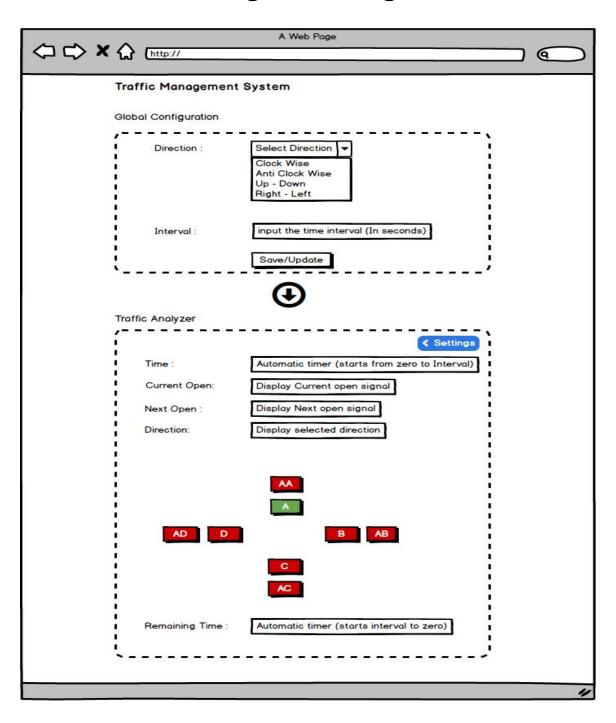
As shown in image, Traffic management practical will consist three pages / wizard as following,

1. Login
2. Global Configuration
3. Traffic Analyzer

Login Page :

You need to design the login page where user can enter username & password and login to the application.

You can take a table in the database for storing username and password, you don't need to create any page to add new users and you can add one or two users data manually.

You need to implement the token based authentication using any techniques (JWT as an example).

After login, each request would be pass with token and need to authorize. There is a logout button, user can logout by clicking on the button.

After login, the global configuration page will be open. **It should not open any pages without authentication in the application.**

Global Configuration:

- This wizard consists global configuration that can be save/update.
- By running the application, it should open this form and user can fill all parameters and save it. It should be saved in database, so it should be used when 2nd wizard is running.
  You can create the table at your own for this.

- There are two parameters in this form:
    - o Direction: It will be a single select dropdown with following values:
        - Clockwise
        - Anti Clock wise
        - Up & Down
        - Left & Right
        User can select any of these options and save it.

    - o Interval: It will be a free form textbox which Is used to enter time interval in seconds.
- Once user will submit the form with all values, it will be close this form and open a new form.

Traffic Analyzer:

This screen will be used to monitor the traffic signals and their statuses. It will show that which signal is currently open. There are some options for emergency cases for ambulance too.
At the top, there are 4 labels displayed which will work following,

Time : It will be a label which will work real time based on values selected on Global configuration screen for interval. For example, If interval may set to 15 seconds then Time will start from zero to 15. It will be real time and once it may reach to interval then it will start again from zero. 0,1,2,…..14,15

Remaining time : It will be a label and similar to the Time field. It will work reversely. It will start from interval to zero. For example, 15,14,13,12…..2,1,0. All other operations will be similar to Time field.

Current Open : It will be a label which shows the current signal which is open at the moment.

Next Open : It will be a label which shows the next signal which will be going to open after the designated time interval.

Direction : It will be label which displayed the direction selected from the global configuration file.

Middle part of the Traffic analyzer screen shows the status of each signal on crossroad.
A, B, C, D : Signal
AA, AB, AC, AD : Ambulance Signal : It indicates that there is an ambulance.

Action :

- Once the application will run, User will choose the direction, interval and save it. It will take them to the 2nd screen.
- On the 2nd screen, it will show the direction on the label. When the screen will load at first, timer will start from 0 to interval for Time field and Remaining Time field will be starting from Interval to 0.

For Example : Interval : 10 seconds, Direction : Clock Wise

2nd Screen : Time field will start from 0 to 10 and remaining time field will start from 10 to 0.
In span of 10 seconds, First A Button will be shows as Green and other buttons(signals) will be Red and Disable.

Once the 10 seconds has been passed, Timer will reset to 0 and start again according to the interval, Signal will be changed as per the direction. All other labels will be changed accordingly like Current Open, Next Open.

If Clock wise direction is selected, It will start from A to B, B to C, C to D, D to A.
For Anti clock wise, It will be in A, D, C, B, A
For Up and Down, It will be A, C, A, C
For Left and Right, It will be B, D, B, D

As per the time interval and direction, After every time interval passed, Signal will be changed as per direction.

It only affects in case of any urgency if any ambulance may arrive on any signal and that signal is closed at the moment. In that case, user will click on the Signal where Ambulance arrive.

For Example :
Interval : 10 Seconds
Direction : Clock Wise
Current Open : B

Ambulance arrive at : A
User will click on AA, Then all signal will be closed and A will open (Signal Green). Interval will start from beginning, Until it is not completed. Once its completed, It will work as per the direction. B will open. Because it is clock wise direction and B is next to A in clock wise.

It should work in all directions.

There is an option called settings in 2nd screen, By clicking on it, it should open the global configuration and form can be updated again and 2nd screen will be refreshed and work as per the given parameters.

Note: A part from above you need to implement the login page and token based authentication and above two forms should be only accessible after login. You can take a table in database for username/password.

Technology Preference:

Front End	React (Any new version would be fine)
Back End	ASP.Net Core API
Database	SQL Server

All logic should be generic and well commented. All methods should be designed in such way so it should handle the error.

You can use any reference to complete the practical using internet/any demo. You will have a day to complete as much as possible.

Please review the complete practical and let me know if you have any query.

Thank you