

TRAFFIC LIGHT SYSTEM

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in partial fulfillment of the requirement for award of the degree of*

**Bachelor of Technology
in
Computer Science & Engineering**

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April, 2023

CERTIFICATE

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DECLARATION

We declare that this written submission represents my ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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ABSTRACT

Traffic light system can control the traffic movement and detect a busy and non busy road. traffic light control system are widely used to monitor and control the flow of automobiles through the junction of many roads. the aim to realize smooth motion of vehicels in the transportation routes , convention systems do not handle variable flows approaching junctions in addition mutual interfaces between accidents and passage of emergency vehicles crossing are not implemented in the existing traffic light system leads to traffic jam and congestion we propose system based on microcontroller using concepts html and css and java script we involved designing and to solve problem of emergency vehicle struck in overcrowded roads

Keywords: web based system, traffic jam

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LIST OF ACRONYMS AND ABBREVIATIONS

TLS	Traffic light system
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheets
JS	Java script
PHP	Hypertext Preprocessor

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Chapter 1

INTRODUCTION

1.1 Introduction

Dynamic traffic light control systems work by adapting their timing to current traffic conditions. They use a detector, which can communicate with the traffic light control system to let them know about current traffic. When an intersection is jammed, they'll adjust timing to let traffic flow better. Dynamic systems use detectors both in the road's surface and above the light. When a car drives over the road-embedded detector, it sends a signal to the control system. This tells the system whether just one car is waiting to go through the intersection, multiple cars or none at all. You've probably noticed this effect before. If you've ever driven up to an empty intersection and the light magically turned green, that doesn't necessarily mean you've perfected your telekinetic powers. It's usually because the detectors above and beneath the road have "seen" your car and adjusted the timing accordingly. These systems use a relatively complex system that allows all the lights in an intersection to communicate with one another. Otherwise, they'd run the risk of causing accidents. Generally, they include a main controller, control circuit, timer, clock signal generator, decoder, decoder drive circuit and digital display decoder drive circuit. Each component plays a critical role in detecting current traffic and communicating the message to the main controller, which relays the message to other traffic lights.

1.2 Aim of the project

Traffic light control systems are widely used to monitor and control the flow of automobiles through the junction of many roads. They aim to realize smooth motion of cars in the transportation routes. The objective is to control traffic congestion in an optimal manner and optimize the duration of green and red lights at intersections. Rather than using a fixed timer for green and red signals, timing should depend on vehicle density.

1.3 Project Domain

Traffic light control system widely used to monitor and control flow of automobiles through the junction of many roads, The aim to realize smooth motion of cars in the transportation routes, as conventional systems do not handle variable flows approaching the junctions. So to solve the problem of emergency vehicles stuck in the overcrowded roads, traffic jam congestion we proposed this traffic light system .

1.4 Scope of the Project

Traffic signals are designed to ensure an orderly flow of traffic, provide an opportunity for pedestrians or vehicles to cross an intersection and help reduce the number of conflicts between vehicles entering intersections from different directions.

1.5 Methodology

FRONT END

First subject area is traffic light and signals we designed the traffic colors for controlling the signals. we used three colors red, yellow, and green using html and css we generated this colors mainly this lights used for operating the traffic rush, and red used for stop light , yellow used for ready light and green used for go light used to store lights and information in signal format

BACK END

Traffic signals play a major role for controlling the traffic over vehicles, stop light, ready light, go light this three are the major colors for controlling the signals to reduce the overtraffic on roads implemented this signals using js

Chapter 2

REQUIREMENT SPECIFICATION

2.1 User characteristics

Road users play an important role in studying traffic engineering. They take up various roles like drivers, pedestrians, cycles etc and assess the conditions in their own unique way. The physical, mental and psychological factors are the main road user characteristics that govern the safe operation of the vehicle on the road. The important mental characteristics of the road user include skill, intelligence, experience, knowledge and literacy. Proper knowledge of the vehicle characteristics, driving practices, rules of roads and traffic behavior is necessary for safe traffic operations.

2.2 Dependencies

Traffic signal system generally consists of three main components: a system control, field equipment, and communications. This is simply because these lights allow the traffic to move in the correct direction. They also stop traffic congestion from arising and they help people to stay safe on the roads. The hardware and the software of the computer/ device on which this specific product will run. There is a database to store the information of all types of users which will be accessible by the Publisher. The data entered by traffic controller are correct. Tracing depends upon Google Maps API's Sign up page consist of user option and their details which stored in Database Mysql. And then login by username and password. This project is depend on web services. Suitable for any kind of person.

2.3 Hardware specification

composition of traffic signal hardware equipment mainly includes the following 6 parts:

1. Traffic lights:
2. Vehicle detector:
3. Wireless remote control device:
4. Electronic police (camera):

5. Single chip microcomputer system:

2.4 Software specification

Traffic light control system widely used to monitor and control flow of automobiles through the junction of many roads, The aim to realize smooth motion of cars in the transportation routes, as conventional systems do not handle variable flows approaching the junctions. So to solve the problem of emergency vehicles stuck in the overcrowded roads, traffic jam, using html, css js

Chapter 3

WEBSITE DESIGN

3.1 Sitemap



Figure 3.1: Architecture Diagram

Description

Traffic controller will enter the user name and password enter the traffic home page and set the time according to the signals through the camera monitoring controller will monitor the traffic signals and pass the traffic lights according to the traffic situation on roads. The web-based interface typically provides an intuitive graphical user interface that allows the user to monitor the status of the traffic lights, view real-time traffic data, and adjust the timing of the traffic lights as needed. Some web-based traffic light systems may also incorporate features like automatic adjustment of traffic light timing based on traffic flow, emergency overrides, and integration with other traffic management systems.

3.2 Design Phase

3.2.1 Data Flow Diagram

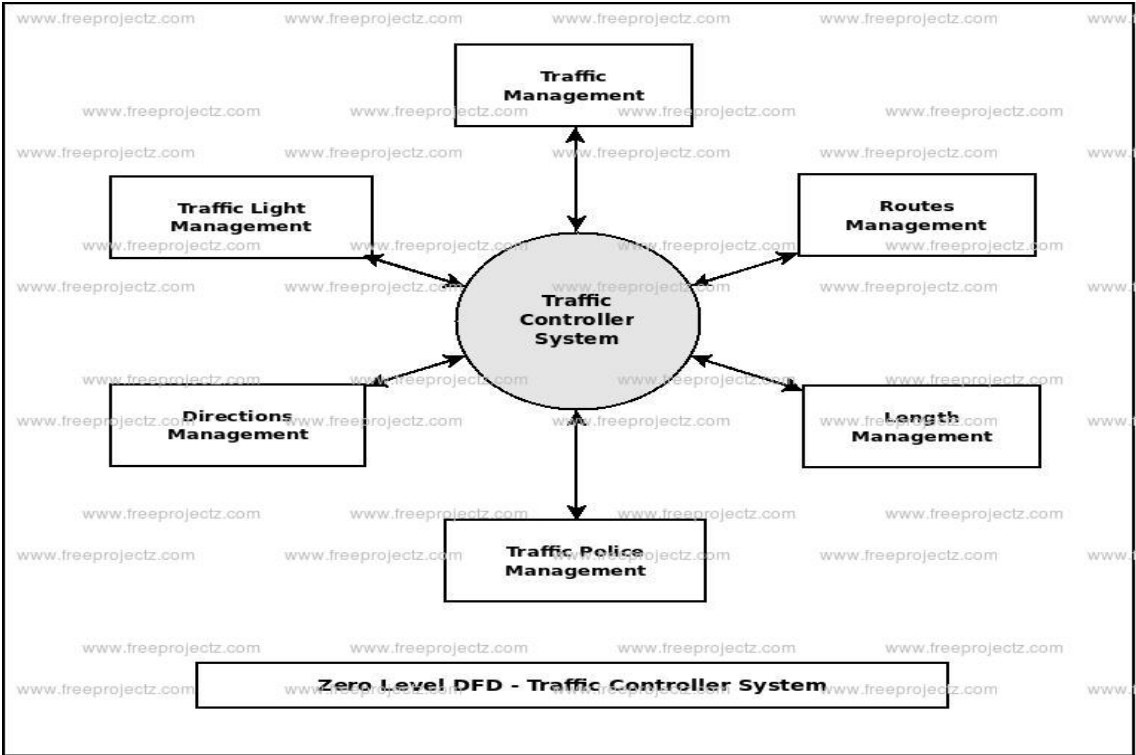


Figure 3.2: Data Flow Diagram

3.3 Front End and Back End Design

3.3.1 Home Page

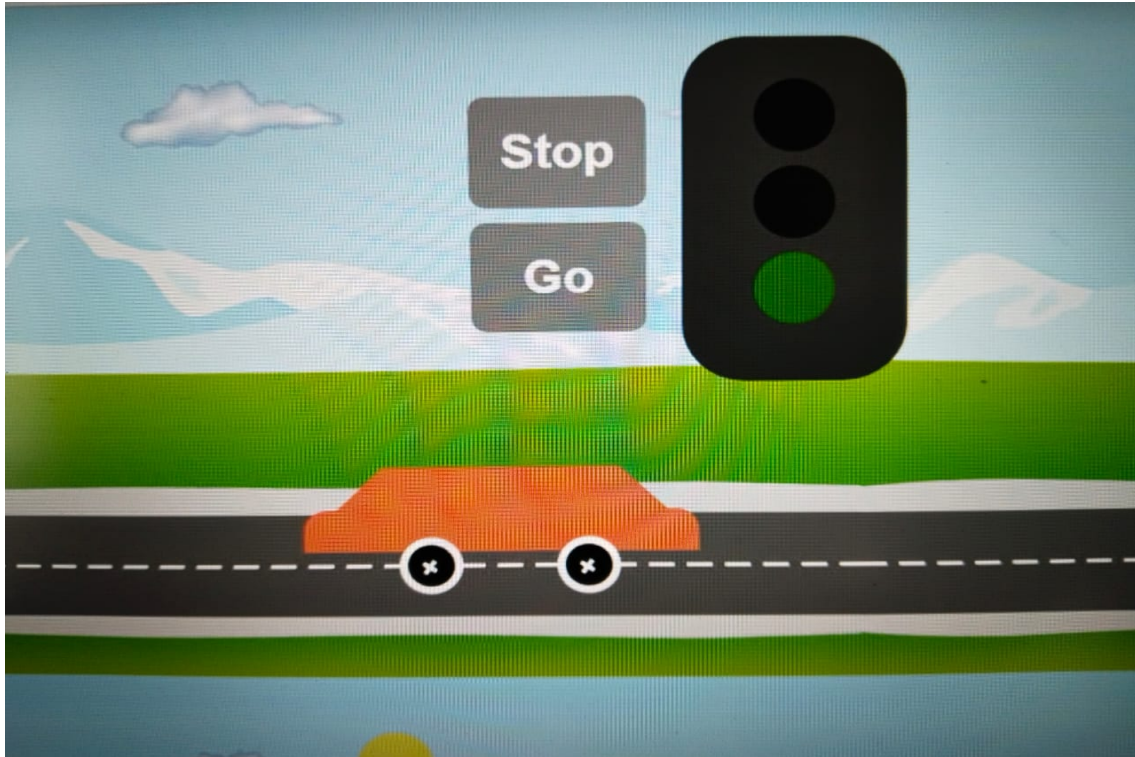


Figure 3.3: Data Flow Diagram

3.3.2 Signup and Login page



Figure 3.4: Data Flow Diagram

Chapter 4

TESTING

4.1 Testing

In any case called as Check. Affirmation is a steady strategy for checking reports and records. This is a method to ensure that whether the product assembled is correct i.e., to check the essentials which we have and to affirm in the case of working up of thing is in the way or not. Exercise required here- are Examinations, surveys, Walkthroughs. Also called as a validation. mainly Traffic Management Systems; Congestion detection; Route suggestion; Traffic efficiency

4.1.1 Test Result

RED

TO STOP THE PARTICULAR VEHICLE

YELLOW

TO GET READY FOR THE MOVING OF VEHICLE

GREEN

START MOVING THE VEHICLE FROM THE CURRENT PLACE

4.1.2 Test Bugs

1. Check if the traffic Signal Light stand has all three lights (green, yellow, and red) per the requirement.
2. Check-in during the expected hours the traffic signal lights are on as per rules.
3. Check the sequence of turn-on traffic Signal lights are based on the specified time (green light- 4.1

min, yellow light 10 sec, red light 1 min).

4. Check if the speed of the Traffic Signal light can be accelerated at the time specified based on the traffic.
5. Check if the traffic lights during off-hours blink in yellow or amber color displaying off for rules.

Chapter 5

WEBSITE LAUNCH



Figure 5.1: Architecture Diagram

Chapter 6

RESULTS AND DISCUSSIONS

6.1 Website performance

Use a Content Delivery Network (CDN): A CDN can help improve the performance of your website by caching your content and serving it from servers located closer to the user. This reduces the time it takes for your website to load. Optimize images: Images can be a significant factor in slowing down website performance. Make sure to compress and optimize all images that are used on your website. You can use tools like Photoshop or online tools like TinyPNG to compress your images. Use efficient algorithms: When writing your JavaScript code, use efficient algorithms to ensure that your code runs quickly. Avoid using loops that have a large number of iterations or operations that are computationally expensive. Test and monitor: Test your website regularly to make sure it performs well. Use tools like Google PageSpeed Insights or Pingdom to monitor your website's performance and identify any issues that need to be addressed.

6.2 Security

When it comes to building a traffic light system, security is an important consideration. Here are some key measures you can take to ensure the security of your traffic light system: Authentication: Implement authentication mechanisms to ensure that only authorized personnel can access the traffic light system. This can be achieved by using strong passwords, two-factor authentication, and other authentication methods. Encryption: Use encryption to protect sensitive data, such as user data and configuration files, from unauthorized access. Use industry-standard encryption algorithms like AES and SSL/TLS to secure data in transit. Access Control: Control access to the traffic light system and limit permissions to authorized personnel only. Use role-based access control (RBAC) to ensure that users only have access to the resources and data they need. Update and Patch: Keep your traffic light system updated with the latest security patches and updates. This will help to prevent security vulnerabilities and ensure that your system is secure against new threats. Audit Trails: Maintain audit trails to track and monitor system activity. This will help you to identify any suspicious activity and provide evidence in case of a security breach.

6.3 Responsiveness and mobile-friendliness

Use a Responsive Design: Use a responsive design framework that allows your website to adapt to different screen sizes and resolutions. This will ensure that your traffic light system looks good and functions well on both desktop and mobile devices. Test on Multiple Devices: Test your traffic light system on multiple devices, including smartphones and tablets, to ensure that it works well and is easy to use on all devices. Optimize Images: Optimize your images to ensure that they load quickly on mobile devices. Use tools like Photoshop or online tools like TinyPNG to compress your images. Keep Forms Simple: Keep your forms and input fields simple and easy to use on mobile devices. Avoid using complex forms that may be difficult to fill out on a small screen. Use Large Font Sizes: Use large font sizes for text on your traffic light system, especially on mobile devices. This will ensure that your text is easy to read and doesn't require users to zoom in. Use Mobile-Friendly Navigation: Use mobile-friendly navigation on your traffic light system to ensure that users can easily navigate your website on a small screen. Use menus that are easy to access and navigate.

Chapter 7

CONCLUSION AND FUTURE ENHANCEMENTS

7.1 Conclusion

In conclusion, building a traffic light system using HTML and CSS can be a fun and rewarding project. By using HTML and CSS, you can create a simple and intuitive user interface that is easy to use and visually appealing. To ensure good website performance, you should optimize your code, use a content delivery network (CDN), and minimize the use of large images and other resources. Additionally, you should consider security measures such as authentication, encryption, access control, and audit trails to protect your traffic light system from unauthorized access and cyber threats. To make your traffic light system responsive and mobile-friendly, use a responsive design framework, test on multiple devices, optimize images, keep forms simple, use large font sizes, and use mobile-friendly navigation. Overall, building a traffic light system using HTML and CSS can be a fun and challenging project that allows you to showcase your coding skills and creativity. By following best practices and incorporating key features, you can create a traffic light system that is both functional and visually appealing, providing a good user experience for all users.

7.2 Future Enhancements

There are several future enhancements that can be made to a traffic light system to improve its functionality and user experience. Here are a few ideas:

- Intelligent Traffic Management:** Implement intelligent traffic management algorithms that adjust the timing of traffic signals based on real-time traffic conditions. This can help reduce congestion and improve traffic flow.
- Integration with Smart City Infrastructure:** Integrate the traffic light system with other smart city infrastructure, such as sensors, cameras, and GPS, to improve traffic management and provide real-time data on traffic conditions.
- Accessibility Features:** Incorporate accessibility features such as text-to-speech capabilities and high-contrast modes to make the traffic light system more accessible to users with disabilities.
- Data Visualization:** Provide data visualization tools to help users better understand traffic patterns and make

informed decisions about their travel plans. Mobile App Integration: Integrate the traffic light system with a mobile app that provides users with real-time updates on traffic conditions and allows them to adjust their routes accordingly. Weather Adaptability: Implement weather adaptability features that automatically adjust the timing of traffic signals based on weather conditions such as rain, snow, and ice. Remote Monitoring and Control: Implement remote monitoring and control capabilities that allow traffic light systems to be remotely monitored and controlled from a central location, improving efficiency and reducing maintenance costs.

Chapter 8

SOURCE CODE

```
;!DOCTYPE html;
;html lang="en";
;head;
;meta charset="UTF-8";
;title;Traffic Signal;/title;
;style;
traffic-signal
border: 8px solid black;
padding: 10px 3px;
width: 50px;
border-radius: 50px;

traffic-signal ; div
width:50px
height: 50px;
border-radius: 50px;opacity: .3;

line1
height:200px;
width:10px; background:000; margin-left:30px; line2
height:10px;
width:70px;
background:000;
green
background-color: green;
yellow
background-color: yellow;
```

```

red
background-color: red;
} /style
} /head
} body onload="timer;"

    } div id="traffic-signal"
} div id="green" } /div
} div id="yellow" } /div
} div id="red" } /div
} /div
} div id="line1" } /div
} div id="line2" } /div
} script
function startTrafficSignal ()
var green=document.getElementById("green")
; var red=document.getElementById("red");
var yellow=document.getElementById("yellow");

    green.style.opacity=1;
setTimeout(function ()
green.style.opacity=.3;
red.style.opacity=.3;
yellow.style.opacity=1;
,5000);

    setTimeout(function ()
green.style.opacity=.3;
red.style.opacity=1;
yellow.style.opacity=.3;
,7000);

    setTimeout(function ()
green.style.opacity=1; red.style.opacity=.3;

```

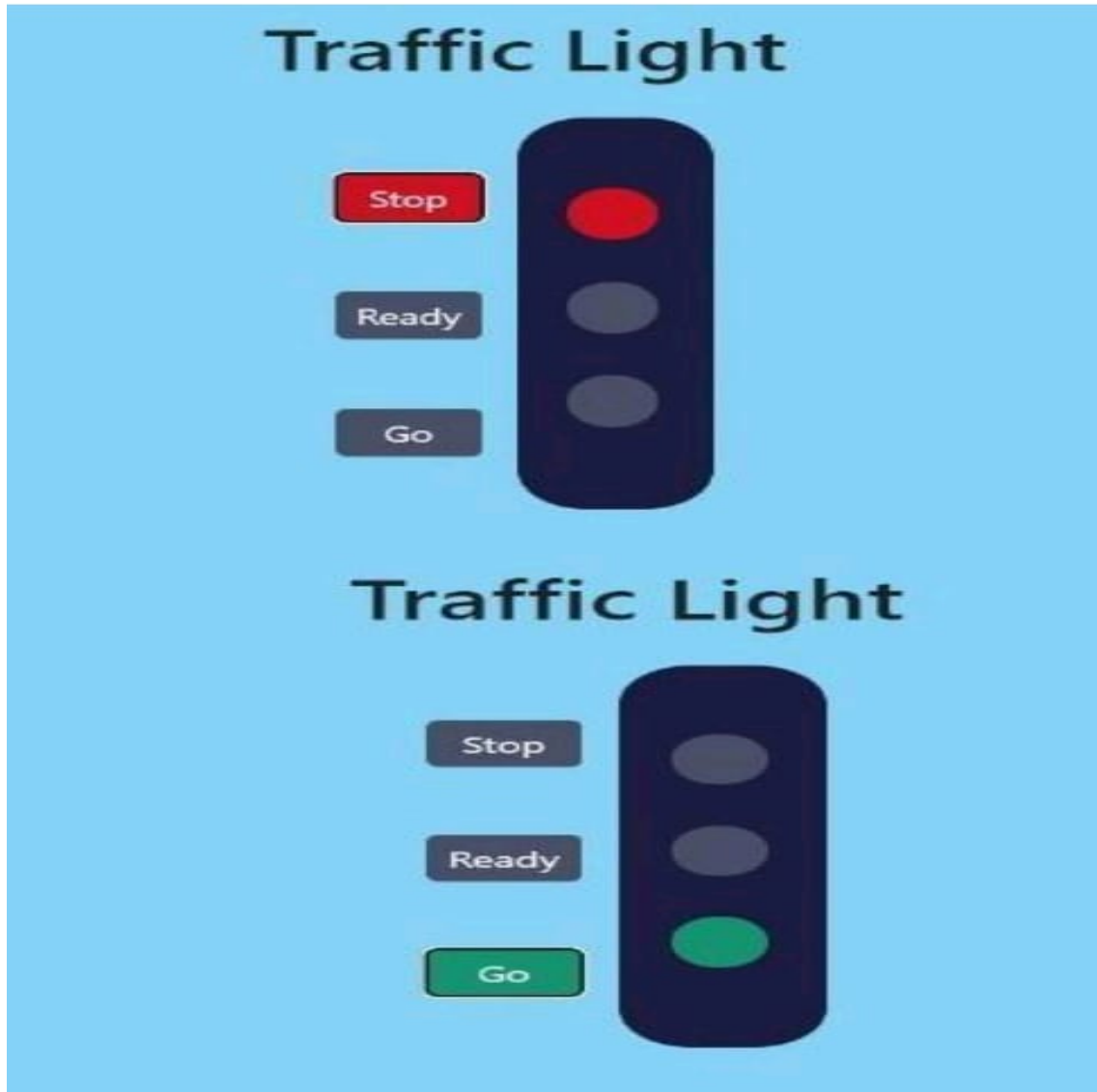
```
yellow.style.opacity=.3;
,12000);

    var timer=setInterval(function ()
startTrafficSignal();
,12000);

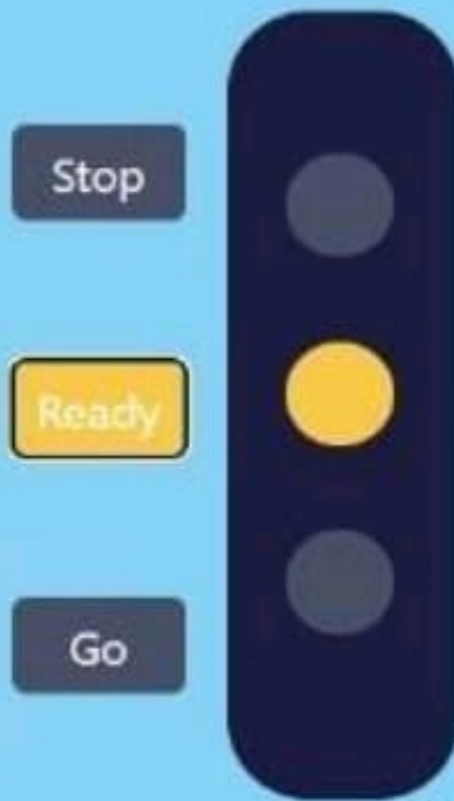
    startTrafficSignal();
;/script;
;/body;
;/html;
```

Chapter 9

SCREENSHOTS



Traffic Light



Traffic Light



Traffic Light



Traffic Light

