Front End Engineering-II

Project Report

Semester-IV (Batch-2022)

PALINDROME CHECKER

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1. INTRODUCTION

1.1 BACKGROUND

The goal of the Palindrome Checker project is to offer a user-friendly tool for determining if a provided input string is a palindrome. A palindrome, whether it's a word, phrase, number, or sequence of characters, reads the same forwards and backwards, disregarding spaces, punctuation, and capitalization. Utilizing web technologies, this project aims to create an interactive and visually appealing interface for conducting palindrome checks.

The inspiration behind the Palindrome Checker project stems from the necessity to provide users with a convenient means of verifying whether a given string qualifies as a palindrome. Palindromes hold significance in various domains, including linguistics, mathematics, and computer science, as they are sequences of characters that exhibit symmetry when read forwards or backwards. By leveraging the capabilities of web technologies, this project endeavors to deliver an accessible solution for palindrome validation.
Here's a breakdown of the background elements:

1. Educational Component: Apart from its practical function, the Palindrome Checker holds educational value. It offers an interactive platform enabling users to delve into the concept of palindromes and comprehend the logic behind their programmable verification. With real-time feedback and clear guidance, users can grasp palindrome concepts more effectively.

2. Technological Advancement: Making use of contemporary web development tools like Alpine.js for interactivity and Tailwind CSS for styling, this project showcases the latest innovations in front-end web development. Through the adoption of these frameworks and libraries, the Palindrome Checker delivers a seamless and visually captivating user experience.

3. Accessibility Integration: Accessibility is a primary focus in the design of the Palindrome Checker. By ensuring compatibility with screen readers, facilitating keyboard navigation, and accommodating other assistive technologies, the project aims to make palindrome verification accessible to all users, irrespective of their physical capabilities.

1.2 OBJECTIVES

1. User-Centric Design: The central aim of the project is to craft an interface that prioritizes user-friendliness, enabling users to effortlessly input a string and promptly receive feedback regarding its palindrome status.

2. Instantaneous Response: The project endeavors to deliver instantaneous feedback to users as they input text, dynamically updating the outcome based on their input. This ensures a fluid and responsive interaction for users.

3. Inclusivity: Another objective is to ensure inclusivity by catering to users with diverse abilities. The interface is designed with accessibility features, including keyboard navigation and compatibility with screen readers, to accommodate all users.

4. Platform Agnosticism: The project strives for compatibility across various platforms, enabling users to access the Palindrome Checker seamlessly across different devices and web browsers, maintaining consistent functionality.

5. Optimized Codebase: Beneath the surface, the project emphasizes the creation of clean and efficient code to enhance performance and facilitate long-term maintainability. This involves harnessing contemporary web development tools for streamlined coding practices.

6. Aesthetic Appeal: The interface is crafted to be visually captivating, employing a harmonious blend of colors, typography, and subtle animations to elevate the user experience, ensuring that using the Palindrome Checker is both engaging and pleasurable.

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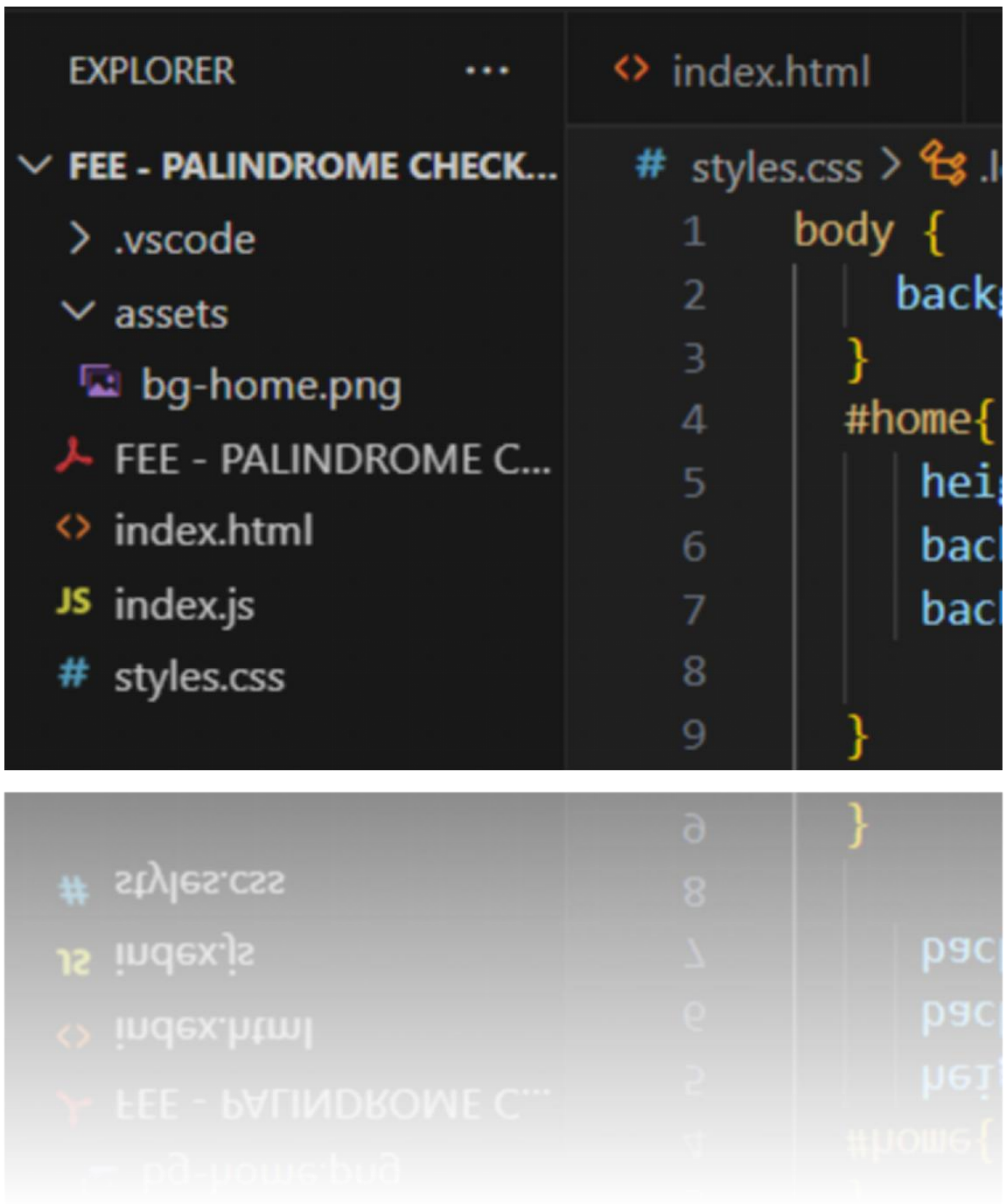
PROBLEM DEFINITION AND REQUIREMENTS

File Structure in VS code snippet



Requirements

1. Input Interface:
Incorporate a text input field for users to input the string for palindrome verification.
Ensure the input field is user-friendly, facilitating effortless text entry and editing.

2. Validation:
Verify that the input contains at least one alphanumeric character.
Handle empty inputs and provide appropriate error messages to guide users.

3. Processing:
Cleanse the input by removing special characters and spaces, and standardize all characters to lowercase for uniform comparison.
Implement the logic to ascertain the palindrome status of the input string.
Offer real-time feedback to users during text input, indicating whether the current input qualifies as a palindrome.

4. Output Display:
Present the result of the palindrome check to users.
Deliver clear and succinct messages conveying whether the input string is a palindrome or not.

5. User Experience:
1.Ensure a seamless and responsive user experience, minimizing delays between input and feedback.
2.Design an interface that is visually appealing and intuitive, fostering user engagement.

6. Accessibility:
Enforce accessibility features such as keyboard navigation and compatibility with screen readers.
Ensure the application is usable by individuals with disabilities, including those with visual or motor impairments.

7. Cross-Platform Compatibility:
Guarantee compatibility across a range of web browsers and devices, spanning desktops, laptops, tablets, and smartphones.
Optimize responsiveness and usability across various screen sizes and resolutions.

8. Performance:
Enhance code efficiency and minimize unnecessary computations to achieve swift response times.
Handle edge cases efficiently, including lengthy input strings or inputs containing special characters.

Methodologies - Code snippets

(1) HTML code

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Palindrome Checker</title>

    <link href="https://cdnjs.cloudflare.com/ajax/libs/mdb-ui-kit/3.4.0/mdb.min.css" rel="stylesheet">
    <link href="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css" rel="stylesheet">
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0-alpha1/dist/css/bootstrap.min.css"
rel="stylesheet">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.4/css/all.min.css"
integrity="sha512-...your-sha-here..." crossorigin="anonymous" />
    <link rel="stylesheet" href="styles.css">
    <script src="index.js"></script>
</head>
<body>

<!-- Home-->
<div id="home" class="jumbotron mb-0">
  <h1 class="display-3">Welcome to Palindrome Checker</h1>
  <p class="lead mb-5">Click below to get started !</p>
  <a id="down" href="#palindromePage" class="btn btn-lg btn-primary">
    <i class="fas fa-chevron-down"></i>
  </a>
</div>
```

```
<!-- Palindrome Checker -->
<div id="palindromePage" class="container-fluid custom-padding">
  <div class="row justify-content-center">
    <div class="col-lg-8">
      <div class="card mb-4">
        <div class="card-body">
          <h2 class="card-title mb-4">Palindrome Checker</h2>
          <div class="input-group mb-3">
            <input type="text" id="inputString" class="form-control" placeholder="Enter a string">
            <div class="input-group-append">
              <button id="button-click" class="btn btn-primary" type="button"
onclick="checkPalindrome()">Check</button>
            </div>
          </div>
          <p id="result" class="text-center"></p>
        </div>
      </div>
      <div class="fun-fact animated-bg" id="box-fact">
        <h3 class="mb-3">Did You Know?</h3>
        <p id="funFact" class="mb-0"></p>
      </div>
    </div>
  </div>
</div>




<script src="https://kit.fontawesome.com/a076d05399.js"></script>


<script src="https://code.jquery.com/jquery-3.5.1.slim.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.5.4/dist/umd/popper.min.js"></script>
<script src="https://stackpath.bootstrapcdn.com/bootstrap/4.5.2/js/bootstrap.min.js"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/mdb-ui-kit/3.4.0/mdb.min.js"></script>

<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0-alpha1/dist/js/bootstrap.bundle.min.js"></script>

</body>
</html>
```

2) CSS CODE

```
body {
   background-color: #f8f9fa;
 }
 #home{
    height: 100vh;
    background-image: url(assets/bg-home.png);
    background-size: cover;

 }
 .display-3{
   margin-top: 130px;
 }
 .lead{
     margin-top: 50px;
     font-size: 30px;
 }
 .custom-padding{
     padding-top: 200px;
 }
 .jumbotron {
   background-color: #343a40;
   color: #fff;
   padding: 100px 30px;
   border-radius: 0;
   text-align: center;
 }
 #palindromePage{
   height: 100vh;
   width: 100%;
   background: linear-gradient(to bottom, #273539, #0e3971, #15677d,#103b74, #273539);
   }

 .btn-primary {
   background-color: #007bff;
   border-color: #007bff;
 }
```

```
#button-click{
  height: 34.8px;
}

.btn-primary:hover {
  background-color: #0069d9;
  border-color: #0062cc;
}
.text-center{
  font-family: 'Cambria';
  color: #0069d9;
  font-size: 18px;
}
.card {
  border-radius: 20px;
  box-shadow: 0px 4px 10px rgba(0, 0, 0, 0.1);
  background-color: rgb(188, 216, 242);
}
.input-group{
  background-color: rgb(188, 216, 242);
}
.animated-bg {
  background: linear-gradient(45deg, #34649b, #2ca2e1, #7b569b,
#36ccd3, #4e35cb);
  background-size: 400% 400%;
  animation: gradientAnimation 15s ease infinite;
}
.btn{
    color: #1e242a;
}
@keyframes gradientAnimation {
  0% {background-position: 0% 50%;}
  50% {background-position: 100% 50%;}
  100% {background-position: 0% 50%;}
}
.fun-fact {
  background-color: #f8f9fa;
  border-radius: 20px;
  padding: 20px;
  margin-top: 30px;
  box-shadow: 0px 4px 10px rgba(0, 0, 0, 0.1);
```

(3) JS code

```
// Fun facts about palindrome checker
var funFactsArray = [
  "The word 'Palindrome' comes from the Greek words 'palin' (again) and 'dromos' (way, direction), meaning 'running back again'.",
  "The longest known palindrome in the English language is 'tattarrattat', coined by James Joyce in Ulysses.",
  "Palindrome sentences are called 'semordnilap', which is 'palindromes' spelled backward.",
  "The date 10-02-2001 is a numerical palindrome, meaning it reads the same forwards and backwards.",
  "Some famous palindromes are 'Madam, in Eden I'm Adam' and 'A man, a plan, a canal, Panama!'."
];


function checkPalindrome() {
  var str = document.getElementById("inputString").value.toLowerCase().replace(/[^a-zA-Z0-9]/g, '');
  var isPalindrome = true;
  for (var i = 0; i < Math.floor(str.length / 2); i++) {
    if (str[i] !== str[str.length - 1 - i]) {
      isPalindrome = false;
      break;
    }
  }
  if (isPalindrome) {
    document.getElementById("result").innerHTML = '"' + str + '" is a palindrome.';
  } else {
    document.getElementById("result").innerHTML = '"' + str + '" is not a palindrome.';
  }
  // Display random fun fact here
  var randomFact = funFactsArray[Math.floor(Math.random() * funFactsArray.length)];
  document.getElementById("funFact").innerText = randomFact;
}

//swipe functionality

document.addEventListener('DOMContentLoaded', function() {
  var startY;
  window.addEventListener('touchstart', function(e) {
    startY = e.changedTouches[0].pageY;
  }, false);
  window.addEventListener('touchend', function(e) {
    var endY = e.changedTouches[0].pageY;
    var deltaY = startY - endY;
    if (deltaY > 10) { // Adjust this threshold as needed
      window.location.href = "#palindromePage"; // Redirect to swipeable content page
    }
  }, false);
});
```

Result

Snippets of the resultant webpage are attached below:-

(1) DESKTOP VIEW