Introduction to Web Development: Building a Simple Web Page

Welcome to the World of Web Development!

In this lesson, we will introduce you to the basics of web development using HTML and CSS. By the end of this lesson, you will have a solid understanding of how to create a simple web page, including adding text, images, and basic styling.

Read the following introduction to web development and answer the questions that follow:

Web development is the process of building and maintaining websites. It involves a combination of technical skills, such as programming languages like HTML, CSS, and JavaScript, as well as non-technical skills like design and user experience.

1. What is web development? _____
2. What are the three main programming languages used in web development? _____

What is HTML and CSS?

HTML (HyperText Markup Language) is used for structuring content on the web. CSS (Cascading Style Sheets) is used for styling and layout.

Complete the following exercises to practice your understanding of HTML and CSS:

1. What does HTML stand for? _____
2. What is the primary function of HTML in web development? _____
3. Write a simple HTML paragraph using the `

   ` tag:

   `<p>` _____ `</p>`

1. What does CSS stand for? _____
2. What is the primary function of CSS in web development? _____
3. Write a simple CSS rule to change the background color of a web page:

```
body {
  background-color: _____;
}
```

```
body {
  background-color: _____;
}
```

Building a Simple Web Page

Create a simple web page using HTML and CSS that includes:

- A heading using the `

`tag

- A paragraph of text using the `

  `tag

- An image using the `` tag
- Basic styling using CSS

Write your HTML code:

```
<!DOCTYPE html>
<html>
<head>
  <title>My First Web Page</title>
  <style>
    /* Add your CSS styles here */
  </style>
</head>
<body>

</body>
</html>
```

Debugging

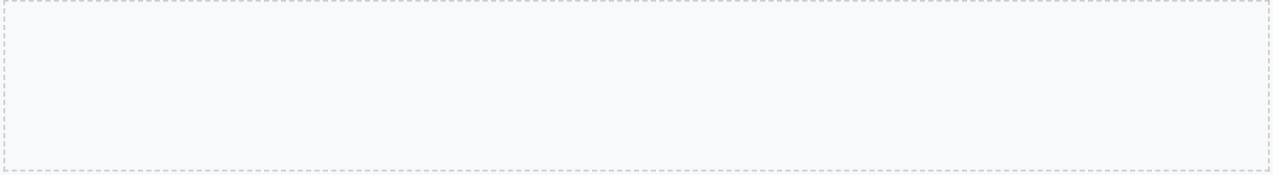Identify and fix the errors in the following HTML code:

```
<html>
<head>
  <title>My Web Page</title>
  <style>
    body {
      background-color: #f2f2f2;
    }
  </style>
</head>
<body>
  <h1>Welcome to my web page</h1>
  <p>This is a paragraph of text.</p>
  <img src="image.jpg" alt="An image">
</body>
</html>
```

What is the purpose of the `alt` attribute in the `` tag? _____

Peer Review

Review a partner's web page and provide feedback on:

- Structure and organization
- Styling and layout
- Content and overall user experience

Write your feedback:

Feedback:
_____

Conclusion

Congratulations! You have completed the introduction to web development lesson. You now have a solid understanding of how to create a simple web page using HTML and CSS.

What did you learn from this lesson? _____

Advanced Concepts

As you progress in your web development journey, you will encounter more advanced concepts that will help you create complex and interactive web pages. One such concept is JavaScript, a programming language that allows you to add dynamic effects to your web pages. With JavaScript, you can create interactive elements, animate graphics, and respond to user input.

Example: JavaScript Basics

JavaScript is a client-side scripting language, meaning that it runs on the user's web browser rather than on the server. This allows for faster execution and more interactive web pages. Here is an example of a simple JavaScript program:

```
let name = 'John Doe';
console.log('Hello, ' + name);
```

Activity: JavaScript Basics

Create a simple JavaScript program that asks the user for their name and then greets them with a personalized message. Use the `prompt()` function to get user input and the `alert()` function to display the message.

Write your JavaScript code:

```
let name = prompt('What is your name?');
alert('Hello, ' + name);
```

CSS Layout

CSS layout is used to control the positioning and arrangement of elements on a web page. With CSS, you can create complex layouts using various techniques such as floats, positioning, and flexbox. In this section, we will explore the basics of CSS layout and how to use it to create responsive and mobile-friendly web pages.

Case Study: Responsive Design

A responsive design is a design that adapts to different screen sizes and devices. This is achieved by using CSS media queries to apply different styles based on the screen size. For example, you can use the following media query to apply a different layout for mobile devices:

```
@media only screen and (max-width: 768px) {
  /* mobile styles */
}
```

Group Activity: Responsive Design

Work in groups to create a responsive design for a simple web page. Use CSS media queries to apply different styles for different screen sizes. Test your design on different devices and browsers to ensure that it is responsive and works as expected.

Web Development Tools

As a web developer, you will use various tools to create, test, and deploy your web applications. Some of the most common tools include text editors, version control systems, and web browsers. In this section, we will explore the different types of web development tools and how to use them effectively.

Example: Text Editors

A text editor is a program that allows you to write and edit code. Some popular text editors for web development include Visual Studio Code, Sublime Text, and Atom. These editors offer features such as syntax highlighting, code completion, and debugging tools to make coding easier and more efficient.

Reflection: Web Development Tools

Reflect on the different web development tools that you have used so far. What are their strengths and weaknesses? How do they help you in your web development journey? Write a short reflection on your experience with web development tools.

Web Development Frameworks

A web development framework is a set of tools and libraries that make it easier to build web applications. Frameworks provide a structure and a set of conventions for building web applications, making it easier to create complex and scalable applications. In this section, we will explore the different types of web development frameworks and how to use them effectively.

Case Study: React

React is a popular JavaScript library for building user interfaces. It allows you to create reusable UI components and manage state changes efficiently. React is widely used in web development and is a popular choice for building complex and scalable web applications.

Activity: React Basics

Create a simple React application that displays a list of items. Use the `useState` hook to manage state changes and the `map` function to render the list of items.

Write your React code:

```
import React, { useState } from 'react';

function App() {
  const [items, setItems] = useState(['Item 1', 'Item 2', 'Item 3']);

  return (


          {items.map((item, index) => (

    • {item}

          ))}


  );
}
```

Web Security

Web security is an essential aspect of web development. As a web developer, you need to ensure that your web applications are secure and protected against common web attacks such as SQL injection and cross-site scripting (XSS). In this section, we will explore the different types of web security threats and how to protect against them.

Example: SQL Injection

SQL injection is a type of web attack that involves injecting malicious SQL code into a web application's database. This can allow an attacker to access sensitive data and compromise the security of the web application. To protect against SQL injection, you can use prepared statements and parameterized queries.

Group Activity: Web Security

Work in groups to identify and fix security vulnerabilities in a sample web application. Use tools such as OWASP ZAP and Burp Suite to scan for vulnerabilities and exploit them. Then, work together to fix the vulnerabilities and secure the web application.

Web Deployment

Once you have built and tested your web application, you need to deploy it to a production environment. This involves setting up a web server, configuring the database, and deploying the web application to a cloud platform or a virtual private server (VPS). In this section, we will explore the different types of web deployment options and how to deploy a web application to a production environment.

Case Study: Deploying to Heroku

Heroku is a popular cloud platform for deploying web applications. It provides a simple and easy-to-use interface for deploying web applications, and it supports a wide range of programming languages and frameworks. To deploy a web application to Heroku, you need to create a Heroku account, install the Heroku CLI, and then use the `git push` command to deploy the web application.

Reflection: Web Deployment

Reflect on the different web deployment options that you have learned about. What are the advantages and disadvantages of each option? How do you choose the best deployment option for your web application? Write a short reflection on your experience with web deployment.

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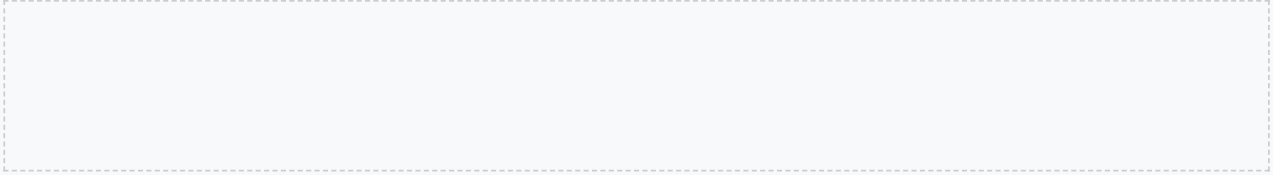Identify and fix the errors in the following HTML code:

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