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FSD Assignment - 01

Aim - Develop responsive web design using HTML5, containing a form. Style the pages using CSS, Use of tag selector, class selector and id selectors. Use Inline, Internal & External CSS, Apply Bootstrap CSS

Objectives - 1. To understand HTML tags
2. To learn the styling of web pages using CSS
3. To learn Bootstrap Front End Framework

Theory -

1) Define Responsive Web Design (RWD). What is its primary goal?

Ans RWD is a design technique where websites automatically adjust their layout, images, and elements to fit any screen size - from desktop monitors to mobile phones.
Primary goal: To provide a smooth, readable, and user-friendly experience across all devices without needing separate websites for each.

2) Explain the role of the <meta name = "viewport" ... >. Why is this tag essential for RWD?

Ans The viewport meta tag tells the browser how to control the page's dimensions & scaling.

Why essential for RWD:
- Sets the page width equal to the devices screen
- Enables proper zooming & scaling
- Ensures media queries & layouts work as int
on mobile devices

3) How does Bootstrap assist in creating a responsive
Discuss the concept of a grid system & how it ad
to different screen sizes

Ans: Bootstrap is a front-end framework that includes a
responsive 12-column grid system.
- Uses predefined classes like .col-sm-4, .col-md-6
.col-lg-3 to define layout per screen size.
- Automatically rearranges columns or stacks
vertically on smaller devices.
- Includes responsive utilities & breakpoints to ad
designs without extra coding.

4) Differentiate between Tag, Class, & ID selectors

Ans: Tag selector: Targets all elements of a certain
HTML tag. Eg: p { color: blue; }
Class selector: Targets elements with a specific class
attribute. Eg: .highlight { background: }
ID selector: Targets one unique element with a sp
Ex: #header { font-size: 20px; }

5) Describe the three main ways to apply CSS to an HTML
Ans:
- Inline: Using style attribute in HTML tags.
- Internal: Using <style> tag in the HTML <head>
- External: Linking a .css file with <link> tag.

...d for RWD:
... width equal to the devices ...
... zooming & scaling.
...ia queries & layouts work ...
...vice

...rap assist in creating a respo...
...nt of a grid system & how...
...n sizes.
...nt end framework that inclu...
...n grid system.
...lasses like .col-sm-4, .col...
... layout per screen size
...rearranges columns on sm...
...ller devices.
... utilities & breakpoints ...
...o coding.

Tag, Class, & ID selecto...
...ts all elements of a ...
... tag. Eg: p { color: ...
...ements with a specific ...
... .highlight { backgrou...
... unique element with ...
... { font-size : 20px; ...

...s to apply CSS to an H...
...ute in HTML tags.
... tag in the HTML <head...
... file with <link> tag.

Conclusion-
In this assignment, I learned how to build responsive web pages using HTML 5. I understtood the use of different CSS selectoss, the ways to apply CSS, and how the view point tag with bootstrap grid system ensures layouts adopt to all screen sizes

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FSD Assignment - 02

Aim - Develop a web application using javascript to implement sessions, cookies, DOM. Perform validations such as checking for emptiness, only numbers for phone numbers, special character requirement for password, regular expression for certain format of the fields etc. Use the mySQL database.

Objectives -
- To understand what form validation is
- To learn basic functioning of Dom objects
- To learn how to apply various techniques to implement it.

Theory -

Explain the role of regular expressions. Why are they a suitable tool for validation data formats like a phone number or checking for the presence of a specific character in a password?

Regular expressions are a powerful tool for matching & manipulating strings based on patterns. They provide a compact way to describe patterns in data that you want to validate or search for. This makes them ideal for validating formats like phone numbers, email addresses, and passwords.

A regex can ensure that a phone number ~~contains~~

matches a specific pattern such as (XXX) XXX-
or XXX-XXX-XXXX.

2) Explain the fundamental difference between a session and a cookie in the context of web application development. How do they work together to maintain a user's state?

Ans Cookie → is stored on the client-side (browser), persists between requests, often used for small data (eg: user preference).

Session → stored server-side, holds dynamic user data (eg: login status), linked via a session ID stored in a cookie.

Together: The session ID is stored in a cookie, allowing the server to identify and retrieve the user's state.

3) What is the purpose of performing both client-side and server-side validation? Describe a scenario where relying solely on client-side validation could lead to a security vulnerability?

Ans Client Side Validation → This occurs in the user's browser before the data is sent to the server. It provides immediate feedback to the user.

Server Side Validation → This occurs on the server after the data has been sent. It serves as the last line of defense to ensure that the data is safe, properly formatted, & secure before it is processed or stored.

Security risk: Relying only on client-side validation can be risky because malicious users can bypass these checks.

5) Give the steps for ... to mysql.

Step 1: Front end sends ...
2: Server-side reg ...
3: Server connects to ...
4 Server sends the ...

FAQs -

Write 3 reasons why ...
- Ensures correct data ...
- Provides instant ...
- Enhances security by ... inputs.

modifying form data

Q Provide a simple example of how a Javascript can interact with the Dom to dynamically change the content of a web page after a user action, such as form submission.

```
<form id = "nameForm">
<input type = "text" id = "nameInput">
<button type = "submit"> Submit </button>
</form>
<script>
document.getElementById('nameForm').addEventListener('submit', function(event){
event.preventDefault();
const name = document.getElementById('nameInput').value;
document.getElementById('greeting').textContent = 'Hello, ${name}!';
});
</script>
```

Give the steps for connectivity from front end using HTML CSS JS to mysql.

Step 1: Front end sends data via JavaScript (AJAX).
2. Server-side (eg. PHP, Node.js) receives & processes the data
3. Server connects to MySQL database.
4. Server sends the response back to the front end.

FAQs -

Write 3 reasons why Form validation are important.

- Ensures correct data format.
- Provides instant user feedback.
- Enhances security by preventing malicious inputs.

2 Give an example of how to modify an attribute using DOM

Ans
```
<img id = "myImage" src = "image1.jpg">
<button onclick = "changeImage()">Change Image</button>
<script>
    function changeImage()
    { document.getElementById('myImage').src = 'image2.jpg';
    }
</script>
```

3 What are the different features of Java Script?

Ans Key Features of Java Script -
- Event handling
- DOM manipulation
- Asynchronous operations (promises, async/await)
- Object oriented & functional programming
- Error handling (try/catch).

Conclusion - This project demonstrates how to build a web app with JavaScript for form validation, DOM manipulation, session & cookie management, & MySQL integration. We validated user input, updated content dynamically, and used sessions/cookies for user state. The database handled secure data storage, making the app interactive and secure.

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FSD Assignment

Aim - Design an interactive front-end application using React.js by implementing templating with components, state & props, & handling events, ensuring a seamless user experience across different platforms.

Objectives - To develop a responsive web application using React.js, applying fundamental concepts of component-based architecture, state management, & event handling. The application will demonstrate the process of building a scalable user interface, templating with components, managing dynamic data with state & props, & handling user interactions with events, ensuring a seamless & responsive experience across various devices & screen sizes.

Theory -

1. Explain the role of state & props in React. How do they differ, & what is the primary purpose of each in managing data flow within a React application?

Ans Role of state → Represents mutable data that can change over time.
: maintained inside a component.
: Used for managing component-specific data.

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FSD Assignment - 03

Aim - Design an interactive front end application using React by implementing template using components, state & props, Class, Events. It must be responsive to scale across different platforms

Objectives - To develop a responsive, interactive front-end application using React.js that effectively demonstrates the fundamental concepts of component-based architecture, state management, and event handling. The application will serve as a practical exercise in building a scalable user interface by implementing templating with components, managing dynamic data with state & props, & handling user interactions with events, ensuring a seamless user experience across various devices & screen sizes.

Theory -

1) Explain the role of State & Props in react. How do they differ, & what is the primary purpose of each in managing data flow within a component based application.

Role of State → Represents mutable data (data that can change over time)
- maintained inside a component.
- Used for managing component-specific data like form

inputs, toggles, counters, etc.

→ Role of props - · Short form for properties.
· Represents immutable data (read only)
· Passed from parent to child component.
· Used to share data between components & make them reusable.

→ Difference:
State - managed within the component, can change
Props - passed from parent, cannot be modified by the receiving component.

2. What is a react component? Difference between a class component & a Functional component, & discuss the advantage of using a functional component with hooks (useState & useEffect) over a class component?

Ans. A react component is a reusable piece of UI, defined either as a class or a function which returns JSX.

(a) Class component → · Uses class keyword.
· State is defined with this.state
· Lifecycle methods like: componentDidMount(), componentDidUpdate().

(b) Functional Component - Defined as a plain JavaScript function. Earlier "stateless", but with Hooks (useState, useEffect), they can handle state & lifecycle.

Advantages of Functional components with Hooks -
· Shorter, cleaner, and easier to read.

· Avoids boilerplate like constructor,
· Hooks (useState, useEffect) make
· Better performance & easier tes

3. Describe the concept of "templat
React. Why is this approach
traditional web development meth
HTML files?

Ans. · In react, UI is built using
instead of one big HTML file
· Each component can encapsu
structure, making the app modu

· Why its superior to tradition
· Reusability → write once, use
· Maintainability - Smaller pieces
manage.
· Scalability → Easy to build
consistent design.
· Faster development → Team can

4. How do you handle user event
code snippet to demonstrate
defined a component & how it
the component's state.

Ans. Handlers defined as function
import React, {useState} from
function Counter() {
const [count, setCount] = use

- Avoids boilerplate like constructor, this.
- Hooks (useState, useEffect) make state management & side effects simpler.
- Better performance & easier testing.

3. Describe the concept of "templating using components" in React. Why is this approach considered superior to traditional web development methods that rely on monolithic HTML files?

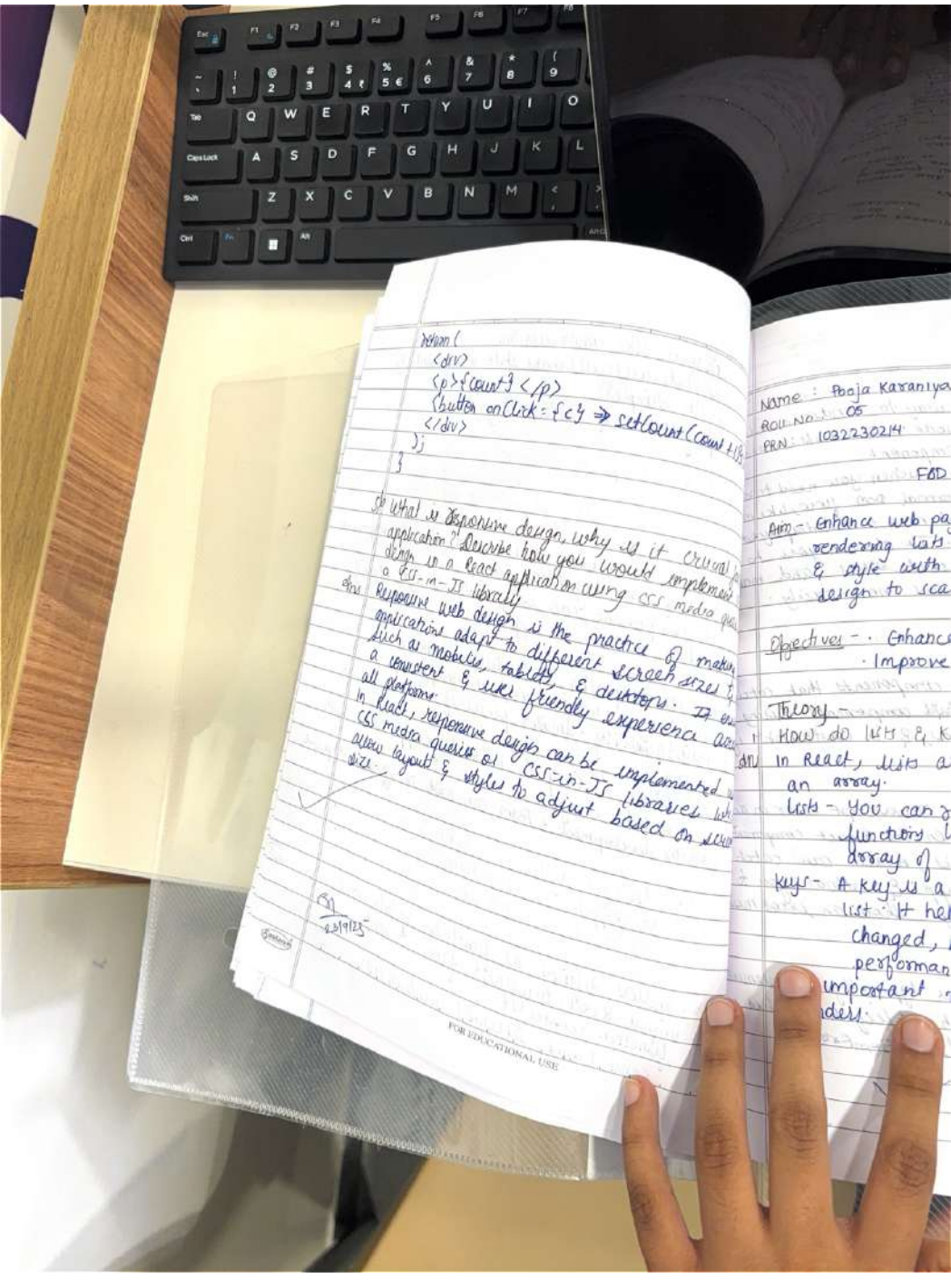
Ans. - In react, UI is built using small, reusable components instead of one big HTML file.
- Each component can encapsulate its logic, style & structure, making the app modular.

- Why its superior to traditional methods -
- Reusability → write once, use multiple times.
- Maintainability - Smaller pieces of code are easier to manage.
- Scalability → Easy to build large applications with consistent design.
- Faster development → Team can work on different components.

4. How do you handle user events in React? Provide a simple code snippet to demonstrate how an event handler is defined in a component & how it can be used to update the component's state.

Ans. Handler defined as function; update state using - useState

```
import React, {useState} from "react";
function Counter() {
  const [count, setCount] = useState(0);
```



return (

{count}
<button onClick={() ⇒ setCount(count + 1)}

);
}

Q6 What is Responsive design, why is it crucial
application? Describe how you would implement
design in a React application using CSS media qu
a CSS-in-JS library

Ans Responsive web design is the practice of makin
applications adapt to different screen sizes &
such as mobile, tablets, & desktops. It en
a consistent & user friendly experience acr
all platforms.
In React, responsive design can be implemented
CSS media queries or CSS-in-JS libraries wh
allow layout & styles to adjust based on view
size.

23/9/23

FOR EDUCATIONAL USE

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FSD

Aim - Enhance web pa
rendering tas
& style with
design to sca

Objectives - · Enhanc
· Improve

Theory -
1. How do lists & k
Ans In React, lists a
an array.
Lists - You can
functions
array of
Keys - A key is a
list. It he
changed,
performan
important
dels.

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FSD - Lab 04

Aim - Enhance web page developed in earlier assignment by rendering lists & portals, Error Handling, Routers, & style with React CSS also make it responsive design to scale well across PC, Tablet & Mobile Phone

Objectives - · Enhance User Interface and Experience.
· Improve Application Robustness & Navigation.

Theory -

1) How do lists & keys work in React?

In React, lists are used to render multiple elements from an array.

Lists - You can render lists by using JavaScript's array functions like map(), which will return an array of React elements to display.

Keys - A key is a unique identifier for each element in the list. It helps React identify which items have changed, been added, or been removed, improving performance during re-renders.

It's important that the key is unique & stable across renders.

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2. What is a react portal & when would you
Ans- A React portal provides a way to render a chil
component into a DOM node that exists outsi
hierarchy of the parent component
Usage- Portals are useful when you need to
a component outside its normal DOM flow, like
tooltips, or dropdowns that need to be displaye
top of the other elements. It allows you to
bypass CSS stacking context issues and m
z-index or positioning issues more easily.

3. Discuss the importance of Error Boundaries in
React.
Ans: Error Boundaries are React components that cat
Javascript errors in their child components durin
rendering, in lifecycle methods, & in constructors
the entire tree below them.
Why important?
· Without error boundaries, a Javascript error in
component will crash the entire React compon
tree. With error boundaries, React can cat
errors in any part of the app & allow you
handle them gracefully (eg: show an error m
or fallback UI).

Usage- Error boundaries are typically implem
using the componentDidCatch lifecycle metho
the new static getDerivedStateFromError.

a react portal is when
Portal provides a way to
ent in to a DOM node
y of the parent component
Portals are useful when
ponent outside its hierarchy
, or dropdowns that need to
the other elements. It also
CSS stacking context
x or positioning issues

the importance of Error Bound

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Error boundaries are typ
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Q. How does React router enable Single Page Application (SPA) functionality?

React Router enables Single Page Application (SPA) functionality by managing routing within the app without the need to reload the page. Instead of traditional full page reloads, React Router uses client-side routing to handle navigation between different views or components.

- SPA concept - In a traditional multi-page app (MPA), each click on a link triggers a new page load from the server. In an SPA, only the necessary part of the page are updated, making the app feel faster & more responsive.
- How react router works - React router uses a <Router> component to manage the history of the app and dynamically render components based on the URL path.

Explain the different ways to style a React application?

There are several methods to style a React application, ranging from traditional CSS to JavaScript driven styles.

1. External CSS - · You can use traditional CSS files or libraries like Bootstrap.
   · This is a simple & familiar way to style React apps but can cause global scope issues.

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2. Inline Styles - You can use the style prop to add inlin
styles to directly to components, but this
approach does not support pseudo cl
or media queries.

3. CSS Modules - CSS modules provide scoped & locall
scoped CSS by default. You import the
as an object and use the class name
as properties.

4. Styled components - is a library that uses tagged
template literals to write CSS-in-JS
It supports dynamic styling & scoped
style by default.

5. Emotion - Similar to styled components, Emotion
is another library for writing CSS in
script, with an emphasis on performan
and flexibility.

6. Tailwind CSS - is a utility first CSS frame
that allows you to apply pre-define
utility classes to elements. You can
it with React to apply styles
directly in JSX.

Conclusion - In conclusion, the React features like
with keys, portals, error boundaries,
, & flexible styling options help build
efficient, user-friendly, and maintain
applications.

23/9/25

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FSD Assignment-05

Aim - Develop a responsive web design using Express Framework to perform CRUD operation & deploy with Node.js use MongoDB.

Objectives - · Develop a Full stack web application.
· Demonstrate Backend development & deployment Policy

Theory -

1) What is the role of Express.js as a web framework for Node.js?

Ans: Express.js is a lightweight and flexible web framework for Node.js that simplifies the process of building web servers & APIs. It provides essential features like routing, middleware support, and request/response handling, allowing developers to create scalable and maintainable server-side applications with minimal setup.

2) Explain the concept of CRUD operations in the context of a web applications?

Ans: CRUD stands for create, read, update and Delete which are the four basic operations needed

to manage data in any application.
- Create → add new data
- Read → retrieve existing data
- update → modify existing data
- delete → remove data

In a web application CRUD is usually implemented through API endpoints that interact with the database. These operations form the backbone of most dynamic application.

3) Why is MongoDB suitable choice for this project?

Ans MongoDB is a document-oriented NoSQL database that stores data is JSON format. This makes it natural to use with JavaScript & Node.js. Its flexible schema allows developers to store different types of data without needing a fixed structure which speeds up development. MongoDB also offers scalability, high performance and easy integration with Express.js through libraries like Mongoose. This makes it a perfect choice for modern web applications where data requirements may change frequently.

4) What steps are involved in deploying a Node.js express application?

Ans: (1) Develop locally → Build your app with express routes & MongoDB integration.

(2) Version control → Push your code to GitHub or another repository.

(3) Choose hosting

(4) Install depe

(5) Configure

(6) Run App

(7) Test A

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in any application.
data
existing data
existing data
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tion CRUD is usually implemen
b that interact with the da
rom the backbone of most
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table choice for this proje
nt-oriented NoSQL databa
JSON format. This make
JavaScript & Node.js. I
developers to store diffe
needing a fixed struct
opment. MongoDB also
ormance and easy integ
ugh libraries like Mong
ct choice for modern
ta requirements may

in deploying a Node.j
your app with expr
& MongoDB integrat
code to GitHub
repository.

(3) Choose hosting → use platforms like heroku, render AWS or digital ocean.

(4) Install dependencies → Run npm install on the server.

(5) Configure environment variables → Set up MongoDB connection string, port, etc.

(6) Run App → Start using node server.js or a process manager like PM2.

(7) Test Deployment → Ensure routes & database connections work correctly online.

Conclusion - Express.js plays a crucial role in simplicity server-side development, while CRUD operations form the foundation of dynamic applications MongoDB is well being suited due to its flexibility. JSON Based storage and scalability deploying an Express app involves preparing the code, hosting it on server, configuring the database & running it efficiently together these components enable the creation of a robust, responsive and fully deployable full stack application.

26/11/25