MERN Syllabus

For Summer Training Program

```
import React from
import logo from
import './App.css

function App() {
  return (
    <div classNam
      <header cla
        <img src=
        <p>
          Edit <c
        </p>
        <a
          classNa
          href="h
          target=
          rel="no
        >
          Learn R
        </a>
      </header>
    </div>
  );
}

export
```

EXPRESS JS

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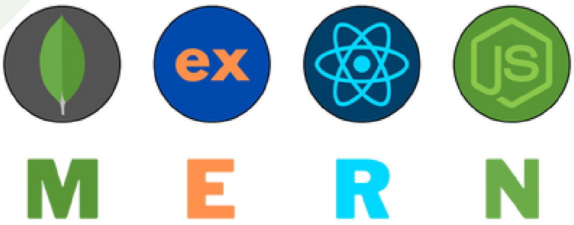
MERN stands for **MongoDB, Express.js, React.js, and Node.js.** These four technologies come together to form a powerful stack that allows developers to build dynamic, full-stack web applications with ease. Each component in the MERN stack serves a specific role, contributing to a seamless development process that is ideal for building both modern, user-friendly websites and robust, scalable web applications.

MongoDB is a NoSQL database that stores data in a flexible, JSON-like format. It allows developers to handle large amounts of data in a highly scalable and efficient way. Unlike traditional relational databases, MongoDB is schema-less, meaning that data can be easily modified and expanded as your application grows. This flexibility makes it a perfect choice for applications that require the storage and retrieval of unstructured or semi-structured data.

Express.js, a web application framework for Node.js, simplifies the process of building web applications by providing robust features for routing, handling HTTP requests, and managing middleware. Its minimalist approach allows developers to build scalable web applications and APIs quickly, without getting bogged down in the complexities of the server-side code. By using Express.js, developers can focus more on the logic and functionality of their applications rather than worrying about the infrastructure.

React.js, the front-end library in the MERN stack, is renowned for its ability to build fast, interactive, and highly dynamic user interfaces. Developed by Facebook, React allows developers to create reusable UI components that update efficiently as the application's data changes. Its virtual DOM ensures optimal performance, making React a preferred choice for building single-page applications (SPAs) and large-scale web projects that require dynamic, real-time user experiences.

Finally, **Node.js** is a powerful, event-driven JavaScript runtime that allows developers to run JavaScript on the server side. It enables fast and efficient execution of code, which is crucial for handling high volumes of requests in real-time applications. Node.js is built on Chrome's V8 engine, giving it exceptional performance capabilities. Moreover, its non-blocking I/O model makes it ideal for building scalable network applications, where thousands of connections can be handled simultaneously.



HTML : MODULE 1

Introduction:

- What is HTML?
  1. Definition and importance of HTML
  2. Role of HTML in web development
  3. Overview of how HTML works with CSS and JavaScript
- History Of HTML ?
  1. Evolution of HTML from HTML 1.0 to HTML5
  2. Key milestones and developments in HTML history
  3. Impact of HTML advancements on web development
- Basic Structures of a Web Page
  1. Fundamental structure of an HTML document
  2. Understanding the <!DOCTYPE html> declaration
  3. Introduction to HTML elements and attributes

HTML Head Tags:

- Purpose and Use of the <head> Section
  1. Common head tags: <title>, <meta>, <link>, <style>, <script>, <meta viewport="">
  2. Using meta tags for SEO and responsive design

HTML Body Tags:

- Structure and Purpose of the <body> Section
  1. Creating and organising content within the body
  2. Basic HTML tags for structuring web pages

HTML Basic Tags:

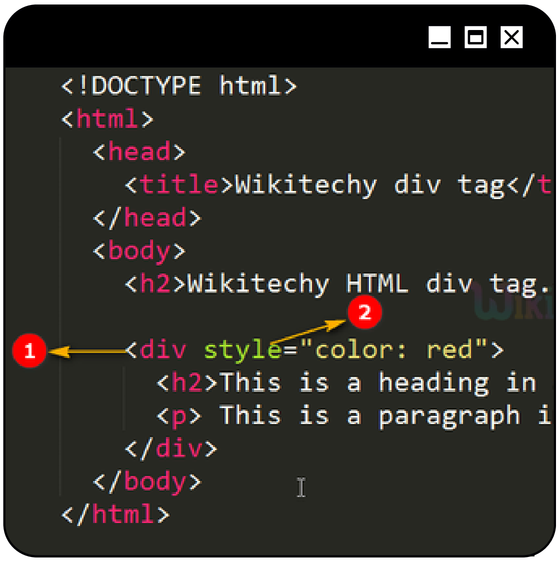
- <br> and <hr> Tags
  1. Usage and examples of line breaks with <br>
  2. Creating horizontal rules with <hr>
- <p>, <h1> to <h6>, <a>, <img>, <ul>, <ol>, <li>, <div>, <span>, <strong>, <em>, <table>, <tr>, <td>, <th>, <form>, <input>, <button>

HTML Link Creation:

- HTML Anchor Tags
  1. Creating hyperlinks with the <a> tag
  2. Understanding href attribute and link destinations
  3. Opening links in new tabs or windows with target attribute

HTML Tables

- HTML Tables
  1. Constructing tables with <table>, <tr>, <td>, and <th> tags
  2. Basic table structure and usage



```
<!DOCTYPE html>
<html>
  <head>
    <title>Wikitechy div tag</t
  </head>
  <body>
    <h2>Wikitechy HTML div tag.

    <div style="color: red">
      <h2>This is a heading in
      <p> This is a paragraph i
    </div>
  </body>
</html>
```

- HTML Nested Tables
  1. Creating tables within tables
  2. Managing nested table layouts
- HTML Merging Cells
  1. Merging table cells with colspan and rowspan attributes
  2. Practical examples of cell merging
- HTML Text Wrapping
  1. Wrapping text within table cells
  2. Handling overflow and text alignment
- HTML Table Background Image
  1. Adding background images to tables or cells
  2. Customising table aesthetics with background images
- HTML Table Cell Alignment
  1. Aligning text and content within table cells
  2. Using align and valign attributes

HTML : MODULE 2

HTML Lists:

- HTML Unordered Lists
  1. Creating bulleted lists with <ul>
  2. Using <li> for list items
  3. Styling unordered lists
- HTML Ordered Lists
  1. Creating numbered lists with <ol>
  2. List item customization and attributes
  3. Nested lists and their formatting

HTML Image Insertion:

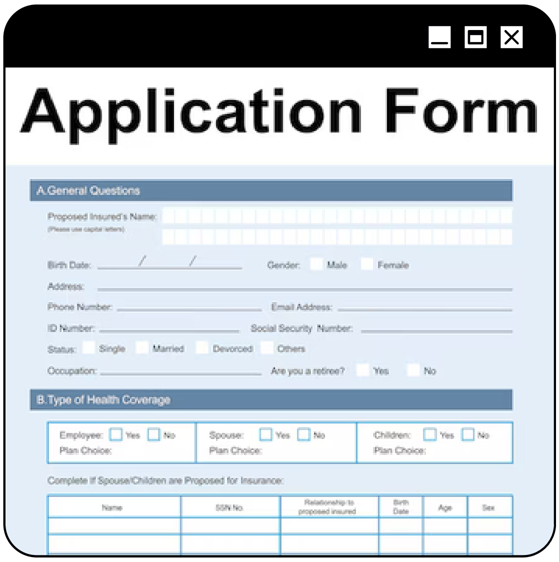
- Inserting Images with the <img> Tag
  1. Understanding src and alt attributes
  2. Image dimensions and alignment

HTML Embedding Videos:

- Embedding Videos Using the <video> Tag
  1. Video attributes: controls, autoplay, loop, muted
  2. Supporting different video formats

HTML Forms:

- Introduction to Forms
  1. Purpose and structure of HTML forms
  2. Basic form elements and their roles



Application Form

A.General Questions

Proposed Insured's Name:
(Please use capital letters)

Birth Date: ____/____/____ Gender: □ Male □ Female

Address: ____

Phone Number: ____ Email Address: ____

ID Number: ____ Social Security Number: ____

Status: □ Single □ Married □ Devorced □ Others

Occupation: ____ Are you a retiree? □ Yes □ No

B.Type of Health Coverage

Employee: □ Yes □ No Plan Choice:	Spouse: □ Yes □ No Plan Choice:	Children: □ Yes □ No Plan Choice:

Complete If Spouse/Children are Proposed for Insurance:

Name	SSN No	Relationship to proposed insured	Birth Date	Age	Sex

- HTML Form Tags and Attributes

1. Essential form tags: <form>, <input>, <label>, <fieldset>
2. Understanding form attributes: action, method, name, id

- HTML Forms - Post vs. Get

1. Differences between POST and GET methods
2. Appropriate use cases for each method

- HTML Forms - Input Text Fields

1. Creating text input fields with <input type="text">
2. Attributes for text fields: placeholder, maxlength, required

- HTML Forms - Select Menus

1. Creating drop-down lists with <select> and <option> tags
2. Handling multi-select menus

- HTML Forms - Checkboxes and Radio Buttons

1. Using <input type="checkbox"> and <input type="radio">
2. Grouping radio buttons for exclusive selection

- HTML Forms - Text Areas and Buttons

1. Creating multi-line text input with <textarea>
2. Adding buttons: <button>, <input type="submit">, <input type="reset">

TAILWIND CSS FUNDAMENTALS : MODULE 1

Introduction to Tailwind

- What is Tailwind CSS?
- Why use utility-first CSS?
- Comparison: Tailwind vs. traditional CSS

Setting Up Tailwind

- Create a basic HTML file
- Add Tailwind CDN link
- Verify Tailwind classes work (e.g., bg-red-500)

Working with Utility Classes

- Text & Font: text-lg, text-red-500, font-bold
- Background & Color: bg-blue-500, text-white, bg-gray-100
- Spacing: m-4, p-2, mt-8

Border and Radius Utilities

- Add borders: border, border-2
- Customize radius: rounded, rounded-full
- Border color & shade: border-gray-300, border-red-500

```
class="bg-q md:flex md:items-center md
v class="fl   bg-teal-50
<h2 class="t   bg-teal-100
  Back End D   bg-teal-200
 </h2>         bg-teal-300        backgrou
/div>          bg-teal-400
div class="mt  bg-teal-500
 <span class=  bg-teal-600
  <button ty   bg-teal-700
    Edit       bg-teal-800
  </button>    bg-teal-900
 </span>       bg-transparent
 <span class=  bg-top
  <button type="button" class="inline-f
    Publish
  </button>
 </span>
</div>
```

TAILWIND CSS LAYOUT & POSITIONING : MODULE 2

Flexbox Layout

- Enable flex: flex
- Center content: justify-center, items-center
- Direction and gap: flex-col, gap-4

Grid Layout

- Basic grid: grid, grid-cols-2
- Responsive grids: md:grid-cols-3, lg:grid-cols-4
- Grid spacing: gap-2, gap-x-4, gap-y-6

Responsive Design

- Screen prefixes: sm:, md:, lg:
- Example use: text-sm md:text-lg
- Hide/show: hidden md:block

Position and Alignment

- Use relative, absolute
- Align content with text-center, text-right
- Center items vertically using flexbo

TAILWIND CSS INTERACTIONS & PROJECT : MODULE 3

Hover and Focus Effects

- Background hover: hover:bg-green-500
- Text hover: hover:text-blue-700
- Focus styles: focus:outline-none, focus:ring

Shadow & Transitions

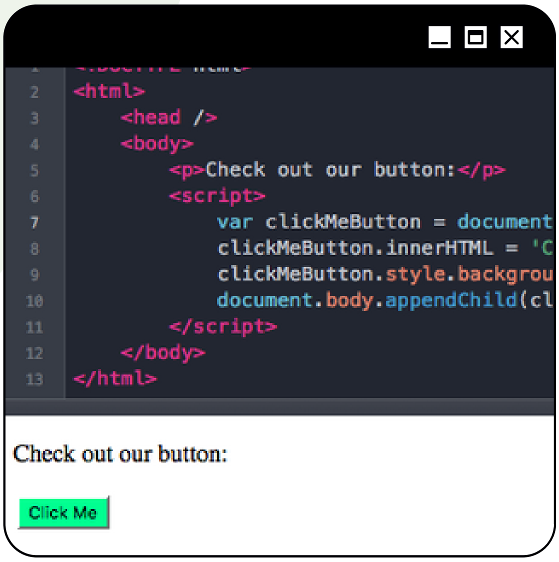
- Basic shadow: shadow, shadow-md
- On hover: hover:shadow-lg, hover:shadow-xl
- Smooth transition: transition, duration-300, ease-in-out

Button and Card Styling

- Buttons: bg-blue-500 text-white px-4 py-2
- Cards: p-6 shadow rounded-lg
- Hoverable cards: hover:bg-gray-100

Mini Project – Landing Page or Card

- Use layout utilities (flex/grid)
- Make it responsive with sm:, md:, lg:
- Add hover effects, spacing, and transitions



```
<html>
    <head />
    <body>
        <p>Check out our button:</p>
        <script>
            var clickMeButton = document
            clickMeButton.innerHTML = 'C
            clickMeButton.style.backgrou
            document.body.appendChild(cl
        </script>
    </body>
</html>
```

Check out our button:

JAVASCRIPT : MODULE 1

Introduction: In this module we will learn about what JavaScript is and the benefits of the language. We can also learn how to write the first JavaScript program.

- JavaScript Introduction
- First Javascript program
- Benefits of Javascript

JAVASCRIPT : MODULE 2

Language Syntax: In this module we will learn about JavaScript language syntax and how to use the program level. And we can also learn to understand the arrays.

- Variable declaration
- Operators
- Control Statements
- Error Handling
- Understanding arrays
- Function Declaration

JAVASCRIPT : MODULE 3

HTML Forms: In this module we will learn about how to use the forms. What are the properties in JavaScript? HTML form validation can be done by JavaScript.

- HTML Document object Model
- Working with HTML form and its elements

JAVASCRIPT : MODULE 4

HTML DOM: In this module we will learn about how JavaScript can access and change all the elements of an HTML document.

- HTML Document object Model
- Working with HTML form and its elements

```
<p id="resultT

<script>
    var targe
```

INTRODUCTION : MODULE 1

Introduction
What is the “MERN STACK”?
MERN - A FIRST OVERVIEW
Course Outline
How To Get The Most Out Of The Course
Using the Course Resources
Course Setup

THE MERN STACK : MODULE 2

Module Introduction
Understanding the Big Picture
Diving Into the Frontend
Understanding the Backend
REST vs GraphQL
Connecting Node & React
MERN - Essentials
Creating our Development Environment & the Development Servers

PLANNING THE APP : MODULE 3

Module Introduction
Understanding the General App Idea
Sketching out the Frontend
Data & API Endpoints used in our App
Required SPA Pages for the Frontend

WHAT IS AN AI IMAGE GENERATOR?

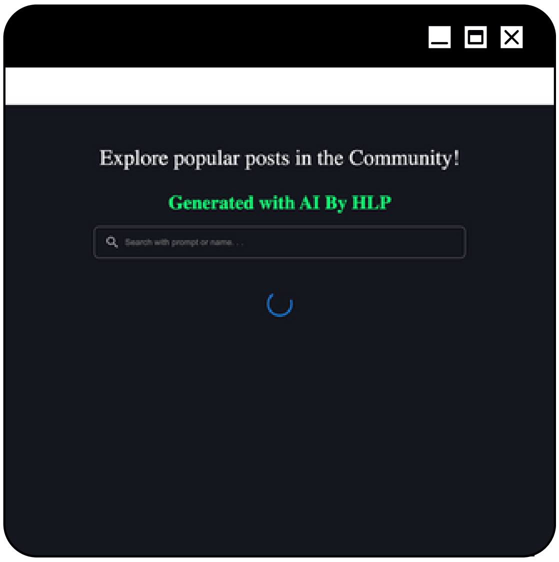
An AI image generator uses machine learning models to create images based on textual descriptions or other input data.

OVERVIEW OF THE MERN STACK FOR THE PROJECT

The MERN stack consists of MongoDB (database), Express (backend framework), React (frontend framework), and Node.js (runtime environment).

SETTING UP THE FOLDER STRUCTURE FOR A MERN PROJECT

The folder structure includes separate directories for backend (server), frontend (client), and shared components like utilities or assets.



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INSTALLING NECESSARY DEPENDENCIES FOR THE BACKEND AND FRONTEND

Use npm to install dependencies like Express for the backend, and React along with MUI for the frontend.

CREATING A GIT REPOSITORY FOR VERSION CONTROL

Initialize a Git repository and commit your project to maintain version control and collaborate efficiently.

BACKEND DEVELOPMENT (NODE.JS + EXPRESS + MONGODB)

Set up Node.js and Express to create the backend API that communicates with MongoDB to store and retrieve data.

SETTING UP UNSPLASH API, CLOUDINARY, AND MONGODB CREDENTIALS

Obtain credentials for Unsplash API and Cloudinary, and securely store MongoDB credentials to access the services.

CREATING API ENDPOINTS FOR FETCHING AND STORING IMAGES

Implement API endpoints to interact with the image sources (Unsplash and Cloudinary), allowing image fetch and storage operations.

FRONTEND DEVELOPMENT (REACT)

Use React for the frontend to display the images fetched/generated from the backend.

SETTING UP A REACT PROJECT WITH STYLED COMPONENTS AND MUI DESIGN USER INTERFACE

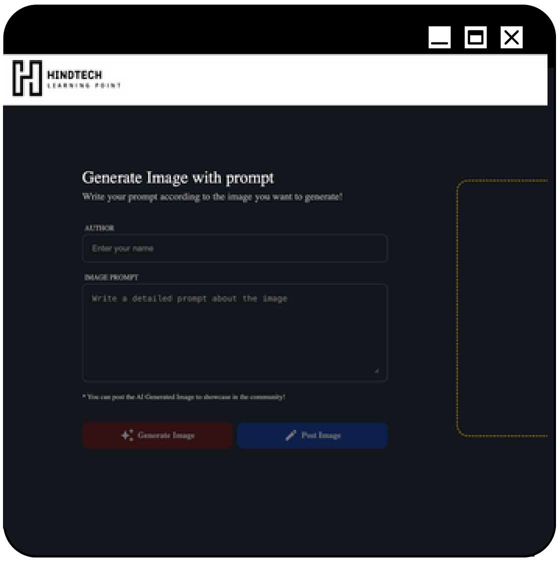
Set up the React project with MUI for styling and custom components to create a user-friendly interface.

INTEGRATE FRONTEND AND BACKEND, DISPLAY FETCHED/GENERATED IMAGES

Integrate the React frontend with the backend API to display the fetched or generated images.

DEPLOYMENT

Deploy the MERN application on a hosting platform like Heroku or Vercel, ensuring the backend and frontend work seamlessly.



Generate Image with prompt

Write your prompt according to the image you want to generate!

AUTHOR

Enter your name

IMAGE PROMPT

Write a detailed prompt about the image

* You can post the AI Generated Image to showcase in the community!

PROJECT VIEW

MERN SUMMER TRAINING SYLLABUS PROGRESS TRACKER

PROJECTS

○ AI Chat & Gen (MERN)

NOTES

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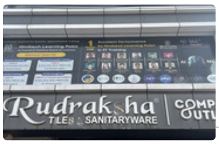
Branch 1



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