



## Mern Stack Web Development

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“Great web design without functionality is like a sports car with no engine.”

~Paul Cookson



## About Coding Ninjas

At Coding Ninjas, our mission is to continuously innovate the best ways to train the next generation of developers and transform how tech education is delivered. Training is designed and provided by professional developers turned educators who have experience working at bigwigs like Facebook, Amazon, Google etc. and are Stanford, IIT, IIIT alumni.

Coding Ninjas teaches 17+ Programming courses in Foundation, Advanced, Data & Development courses such as Machine Learning, Data Science, Web Development, Android and more.

## Doubt Support

We have developed a very scalable solution using which we are able to solve 4000+ doubts every single day with the help of 500+ doubts on the platform itself with an average rating of 4.8 out of 5.

## Placement Cell

50,000<sup>+</sup>

Students taught so far

78%<sup>+</sup>

Percentage placement

2500<sup>+</sup>

Students placed in top MNCs

300<sup>+</sup> Placement Partners

Number of placement partners and average salary of students

7.6L Average Salary

100<sup>+</sup>

Students received International job offers



# Ankush Singla

Co-Founder & Instructor

Ankush holds a Bachelor's degree in Computer Science from India's most premier institute- IIT Delhi and a Master's degree in Computer Science from Stanford University.

He is a coding enthusiast and has worked with bigwigs like Amazon and Facebook in the past.



### Live Mentor Support & Student Experience Team

Dedicated TAs and Student experience team to make sure that your doubts get resolved quickly and you don't miss your deadlines.



### Want A Break? Pause Your Course

Take a short break when you need it. Pause your course for upto 60 days. Resume when you are ready



### Get An Industry Recognised Certificate

Get awarded with an industry recognised certificate after you complete your programming course



### Be A Part Of The Learning Community

Slack groups to meet your batchmates. Learn from your peers about resources, doubts and more!

# Programme Overview

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## ○ Course Overview

Become a full stack web developer using the best tools and technologies out there - MERN. By the end of this course you will gain the mastery over nodejs, reactjs and advanced HTML & CSS which will enable you to create effective and responsive web applications for all intents and purposes.

## ○ Features

16

Months

12<sup>+</sup>

Projects

140<sup>+</sup>

Hours of video  
content

400<sup>+</sup>

Problem

## WHY Mern Stack web development?

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- MERN Stack web development can make the development entire process smooth
- Learn the best practices of converting data to a graphical interface, through the use of HTML, CSS, and JavaScript.
- Learn the basics of adding server-side logic to any web application using Node.js.
- MERN stack can make faster development of smaller applications.

## Companies Hiring

amazon

Adobe

LinkedIn

intel

slack

Google

ORACLE

zomato

Flipkart

## Course Outcome

### ○ INTRODUCTION TO PROGRAMMING

Learn the basics of the most popular programming languages (C++ /Java / Python) and become an expert in the core fundamentals of programming.

### ○ DATA STRUCTURES AND ALGORITHMS

Data structures and algorithms is all about organising the information and finding the most efficient approach to solve a problem. Learning these concepts will in turn help you to improve your problem-solving skills and solve any real-world problems using technology.

### ○ Front end Web Development with React

Learn the best practices of converting data to a graphical interface, through the use of HTML, CSS, and JavaScript. Build amazing user interfaces or UI components using React library.

### ○ Backend web development with Node.js

Learn the basics of adding server-side logic to any web application using Node.js

## Placement after the course



Abhishek Jha

Capgemini



Sudhanshu Kumar

Deloitte.



Rubleen Kaur

amazon



sidharth pantula

Cognizant

# Course Offerings

## Basic

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x

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Front-End Web Development

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Back-End Web Development with Node.js

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Advanced frontend with React.js

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x

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NASSCOM Certificate

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Dedicated Placement Cell with curated job openings

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x

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x

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x

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x

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8 Months

80<sup>+</sup> Hours

12<sup>+</sup> Projects

60<sup>+</sup> Assignments

## Standard

Introduction to Programming

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Data structures and algorithms

.....

Front-End Web Development

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Back-End Web Development with Node.js

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Advanced frontend with React.js

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x

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NASSCOM Certificate

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Dedicated Placement Cell with curated job openings

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x

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x

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x

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x

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x

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14<sup>+</sup> Months

140<sup>+</sup> Hours

12<sup>+</sup> Projects

10<sup>+</sup> Assignments

300<sup>+</sup> Problems

## Pro

x

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x

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Front-End Web Development

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Back-End Web Development with Node.js

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Advanced frontend with React.js

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Premium Hirst Account

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NASSCOM Certificate

.....

Dedicated Placement Cell with curated job openings

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Mock interview/Industry mentor guidance sessions (10)

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Workshops for building your resume and

.....

Curated interview problems (100)

.....

DSA based product companies Mock Test Series

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2 months Free Course Extension

10<sup>+</sup> Months

80<sup>+</sup> Hours

12<sup>+</sup> Projects

60<sup>+</sup> Assignments

100<sup>+</sup> Problems

## Premium

Introduction to Programming

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Data structures and algorithms

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Front-End Web Development

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Back-End Web Development with Node.js

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Advanced frontend with React.js

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Premium Hirst Account

.....

NASSCOM Certificate

.....

Dedicated Placement Cell with curated job openings

.....

Mock interview/Industry mentor guidance sessions (10)

.....

Workshops for building your resume and

.....

Curated interview problems (100)

.....

DSA based product companies Mock Test Series

.....

2 months Free Course Extension

16<sup>+</sup> Months

140<sup>+</sup> Hours

12<sup>+</sup> Projects

100<sup>+</sup> Assignments

400<sup>+</sup> Problems

# Detailed Curriculum

## Introduction to Programming

Topics	Sub-topics	Details
Basics of Programming	Flowcharts	Introduction to flowcharts, Decision making using flowcharts, Loops, Example problems
	Variables and Data types	First program, Variables and data types, Taking input, How data is stored in memory, Arithmetic Operators
	Conditional statements	Introduction to If else, Relational and logical operators, Nested conditionals
Loops and Functions	While loops	While loops, Flow of execution of statements in while loop, Example problems using while loop
	Patterns	Introduction to patterns, Basic Patterns, Square Patterns, Triangular Patterns, Character Patterns, Reverse Triangle, Inverted patterns, Isosceles triangles
	For loops	For loops, Break and Continue, increment - decrement operators
	Functions	Introduction to functions, Working of function calling, Variables and its scope, Pass by value
Arrays	Introduction to arrays	Introduction to arrays, How arrays are stored in memory, Passing arrays to functions
	Searching and Sorting	Understanding Binary Search, Selection sort, Bubble sort, Insertion sort, Merging two sorted arrays
Strings and 2D Arrays	Strings	Introduction to strings, storage of strings and their inbuilt functions
	2D Arrays	2D arrays, Storage of 2D arrays, Example problems using 2D Arrays

# Introduction to Data Structures

Topics	Sub-topics	Details
Problem Solving Techniques	Recursion	Introduction to recursion, Principle of mathematical induction, Fibonacci numbers, Recursion using arrays, Recursion using strings, Recursion using 2D arrays
	Time and space complexity	Order complexity analysis, Theoretical complexity analysis, Time complexity analysis of searching and recursive algorithms, Theoretical space complexity, Space complexity analysis of merge sort
Object-oriented programming	Basics of OOP	Introduction to oops, Creating objects, Getters, and setters, Constructors and related concepts, Inbuilt constructor and destructor, Example classes
	Advance concepts of OOP	Static members, Function overloading and related concepts, Abstraction, Encapsulation, Inheritance, Polymorphism, Virtual functions, Abstract classes, Exception handling
Linear Data Structures	Linked lists	Introduction to linked list, Inserting node in linked list, Deleting node from linked list, Midpoint of linked list, Merge two sorted linked lists, merge sort of a linked list, Reversing a linked list
	Stacks and Queues	Introduction to stacks, Stack using arrays, Dynamic Stack class, Stack using linked list, Inbuilt stack, Queue using arrays, Dynamic queue class, Queue using linked list, Inbuilt queue
Trees	Generic Trees	Introduction to Trees, Making a tree node class, Taking a tree as input and printing, Tree traversals, Destructor for tree node class
	Binary Trees	Introduction to Binary Trees, Taking a binary tree as input and printing, Binary Tree traversals, Diameter of binary tree
	Binary Search Trees	Introduction to Binary Search Trees, Searching a node in BST, BST class, Inserting and Deleting nodes in BST, Types of balanced BSTs
Advanced Data Structures	Priority Queues	Introduction to Priority Queues, Ways to implement priority queues, Introduction to heaps, Introduction to Complete Binary Trees and its implementation, Insert and Delete operations in heaps, Implementing priority queues, Heap sort, Inbuilt Priority Queue

Topics	Sub-topics	Details
	Hashmaps	Introduction to Hashmaps, Inbuilt Hashmap, Hash functions, Collision handling, Insert and Delete operation implementation in hashmap, Load factor, Rehashing
	Tries	Introduction to Tries, Making a Trie Node class, Insert, Search and Remove operation implementation in Tries, Types of Tries, Huffman Coding
	Graphs	Introduction to Graphs, Graph Terminology, Graph implementation, Graph Traversals (DFS and BFS), Weighted and Directed Graphs, Minimum Spanning Trees, Cycle Detection in Graphs, Kruskal's algorithm, Prim's Algorithm, Dijkstra's algorithm
Dynamic Programming	Introduction to Dynamic Programming	Introduction to Memoization, Introduction to Dynamic Programming, Fibonacci numbers using recursion, memoization and dynamic programming
	Applications of Dynamic	Longest Common Subsequence (LCS) using recursion, memoization and dynamic programming, Edit distance using recursion, memoization and dynamic programming, Knapsack problem using recursion, memoization and dynamic programming





# Frontend Module

Topics	Sub-topics	Details
Getting started with Basics	History of Web	Understanding how and who built the web
	Client server architecture	General architecture used by websites
	What happens when you visit a	Learning what happens behind the scenes while opening a website
Introduction to HTML	HTML structure	How to create the structure of a web page
	Tags in HTML	Learning about various tags in HTML like <a>, <ul> etc
More on HTML	More tags	Practice creating HTML with more tags
	Block v/s Inline elements	Understand the difference between inline and block HTML elements
	Table	Learn to create tables in HTML
Forms	Form	How to create the structure of a web page
	Form fields	What is an HTML form
Intro to CSS	CSS Introduction	What is CSS and how to use it in HTML
	Blog page	Building and styling the blog project

Topics	Sub-topics	Details
Styling with CSS	CSS units	Learning about various CSS units used to style HTML elements
	CSS box model	Understanding the CSS box model
Starting with Resume project	Starting the project	Start building the Resume project by creating the HTML structure
Flex	Intro to Flex	Introducing SASS, setting up SASS for our project
	Flex properties	Explaining 1:1, 1:M and M:M DB relations
	Using flex in Resume	Utilising flex to style the Resume project
Responsive designs	Media queries	Learning storage in SQL databases
Completing Resume	Pseudo elements	What are pseudo elements and where to use them
	Finishing up	Finish building the Resume project
Animations and 3D space	Animation properties	Basics of CSS animation and how to animate HTML elements using animate.css
Bootstrap	Frontend frameworks	What are frontend frameworks and how to use one
	Grid system	Learning about grid system of bootstrap
	Bootstrap components	Using various other bootstrap elements like Navbar, Jumbotron etc
Major Project	Assignment	Build a music player project with your newly gained skill set

Topics	Sub-topics	Details
Starting with Javascript	Intro to JS	What is JS and history of JS
	Variables, operators, loops	Learning the basics of the language
JavaScript: Functions and Arrays	Scope	Understanding scope in JS
	Hoisting	What is hoisting and its application
	Functions expressions v/s Function declaration	Difference between function expression and declaration
	Arrays and its usage	What are arrays and using array functions like splice, slice etc.
Objects and Timing Events	Intro to Objects	What are objects, how to create them and using different notations to access object's data
	Object functions	Learn to iterate over objects, delete object properties, creating nested objects
Understanding DOM	DOM	Understanding DOM, what it is, how to access elements from the DOM
	Events	How to manipulate DOM events in JS
Calculator Project	Assignment	Creating a mini calculator with basic functionality
Mini Projects Using Javascript	let v/s var	Learning different ways to create variable
	Catch me if you can	Build a game using vanilla Javascript

Topics	Sub-topics	Details
Closures	Revision	Revising some old concepts like Scope, window object etc
	IIFE	What are immediately invoked function expressions
	Closures	What are closures and its application
	Arrow functions	Learning about arrow functions and bindings in arrow functions
Constructors and Prototypes	“this” keyword	How does the “this” keyword works in JS
	Prototypes	Discussing what are prototypes in JS, why do we use them and its application
	Class	Learning about using classes in JS and how to deal with class inheritance in JS
Project: Ping Pong Game	Assignment	Building the famous ping pong game with Javascript
Ashynchronous JavaScript	Promises, Callback	What are promises and callbacks in Javascript, Why to use
	Timed Events	What is setTimeout, Event loops in javascript
	Async Await	What are Async Await in Javascript, Why that is important
TODO list	SPA, MPA	Single page application and multiple page application
	API	How to use API in Javascript
	IIFE module design pattern	
jQuery	Intro to jQuery	What is jQuery and what is the need for it
	Event handling in jQuery	Handling various JS events with jQuery and exploring the library
Ajax	Intro to AJAX	What are async requests, what is API and JSON
	Ajax requests with jQuery	Making ajax requests with jQuery and handling errors
Promises	Intro to promises	What is a promise, how do we use promises and chaining promises

Topics	Sub-topics	Details
Git	Intro to Git	What is git and why it's helpful
	Branches	Exploring branches in Git. How to create branches.
	Git workflow	Understanding push, commits, pull requests and using git for teams and individual

## Backend Module

Topics	Sub-topics	Details
Node.js : The Beginning	Intro to Node	Introduction to the course, hello world with nodejs
	Setting up	Setting up tools and the project
Node.js : Writing Our First Server	Intro to servers	What are servers and how one can use them
	Setting up node server	Beginning the project by setting up the very first node server
	nodemon	Introducing nodemon to monitor changes made to the server
My First Express App :: A List of contacts	MVC	MVC architecture for our server
	Express	What are frameworks, using express with node

Topics	Sub-topics	Details
My First Express App : Continued	Ejs	What are template engines, setting up and working with Ejs
	Creating the contact list	Building the contact list, sending data to server, parsing the data
	Middleware	Using query parameters in our app for deleting contact
	Query parameters	What is a middleware and how to use one
My First Express App :: Intro To Databases	Intro to Databases	What are databases, SQL and NoSQL databases
	MongoDB	What is MongoDB, how to use it and setting up MongoDB for the project
	DB operations	CRUD operations for MongoDB
Beginning The Major Project 1	Directory structure and setup	Setting up the MVC directory structure, router and ejs setup
	Controllers	Creating controllers and router for handling incoming requests to the server
Major Project - 1	Assignment	Build a Todo list app using Nodejs and MongoDB
Beginning the Major Project - 2	Partials, Layouts	Understanding and creating Partials and layouts in views
	Static files	Setting up static file access
	Mongoose	Linking MongoDB using Mongoose
Authentication Using Passport js	Intro to passportjs	What is passportjs, setting up passportjs for the project
	MongoStore setup	Setting up MongoStore for session cookies

Topics	Sub-topics	Details
Manual Authentication	User schema	Setting up user schema for our app
	Cookies	What are cookies and how to use them in the app
	User sign up and sign in	Build user sign in and sign up flow and learn how to authenticate users manually
SASS	Intro to SASS	Introducing SASS, setting up SASS for our project
Database Relations (Posts, Comments)	DB relations	Explaining 1:1, 1:M and M:M DB relations
	Relationship for Post and Comments	Understanding the relationship between Post and Comments, creating schemas for both
	SQL storage	Learning storage in SQL databases
Deleting and Updating Objects in Database + Distributing Views	Deleting Posts/Comments/Users	Understanding how deletion works with Posts and Comments
	User profile	Working on user profile and updating SCSS for other pages
Async Await + Error Handling	Async await	What is async await and converting our code to async await
	Flash messages	How to create flash messages, using Noty to show flash messages
Converting to AJAX	Using AJAX	Learn how to use AJAX for post creation, deleting post etc
File upload	Intro to file upload	Learning how to handle file uploads
	Multer	Using multer to handle profile picture upload in the project

Topics	Sub-topics	Details
Social Authentication (Mini Lecture)	Social auth with Google	What is social authentication and how does it actually works
	Using passport for Google auth	Setting up passport for google social auth
APIs (making APIs and JWT authentication)	Intro to APIs	What are APIs and why do we use them
	JWT	Understand what is JWT, how does authentication and authorization works, build some APIs for the same
Parallel Jobs + Mailer	Nodemailer	Intro to mailers, setting up Nodemailer for sending emails
	Sending mails	Learn how to setup and send emails for your project
	Delayed jobs	Understand what are delayed jobs and how they can be helpful using the Kue library
Friends + Likes	Polymorphic relation	Intro to a new DB relationship i.e. Polymorphic relations
	Making friends	Using Polymorphic relationship to create add a friend functionality
Chatting Engine	Sockets	What are sockets and how to use them
	Socket.io	Setting up Socket.io and using it to send messages
Gulp :: Getting deployment ready	Introduction to production environments	Learn how to create a production environment for the project using environment variables
	Gulp	What is gulp, using gulp to automate certain tasks
Deployment	AWS	Learning how to deploy apps on AWS, SSH to set up the server, understand and setup Nginx
Beginning the Major Project - 2	Starting to build a new project	Setting up to build the major project assignment



Topics	Sub-topics	Details
Angular	All about Angular	Intro to frontend frameworks, creating a basic app
React	All about React	Intro to React and building basic components
Vue	All about Vue	Intro to React and building basic components

## React Module

Topics	Sub-topics	Details
Intro to React	SPAs v/s MPAs	Difference between Single page apps and Multi page apps
	React philosophy	What is React's philosophy?
	React v/s others	Why React stands out from other JS libraries and frameworks.
	All About React	Intro to React and Building basic components
Hello World	Using React	Ways to start using React in a project
	Babel	Using babel and understanding how it works with React
	Conditional rendering	Rendering different components based on different conditions

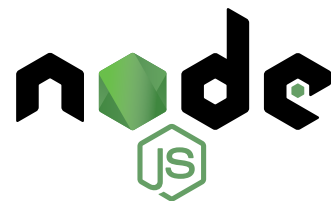
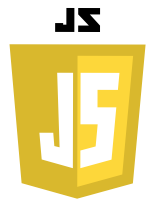
Topics	Sub-topics	Details
Mini Project: Starting the project	Introduction to the project	Introduction to Cart and its working
	Adding CSS	Styling the cart using CSS
	Using state	Adding state to Cart
Mini Project: Managing state	More on React state	React state in depth
Mini Project: Finishing up	Rendering lists	How to render list of items
	Props	What are props and how do we work with them
	Delete, adding Navbar, total products count	Building more functionalities of cart
Firebase: Mini project extended I	Introduction to Firebase	Understanding what is firebase and how it actually works
	Component lifecycle	Learning about lifecycle of a React component
	Firebase setup	Setting up firebase and adding it to the project
Firebase: Mini project extended II	CRUD with Firebase	Learning how to create, read, update and delete data from firebase
	Querying data	Querying data from firebase
Mini Project		Assignment project, building a vintage iPod
Major Project: User profile	Settings page, editing a user, add user as a friend	Building various functionalities of the social media app

Topics	Sub-topics	Details
Intro to Redux	All about Redux	What is redux, why and when do we use it
	Setting up the project	Setting up the Movie search project
	Adding U	Start adding components to the project
Redux: Actions, Reducers, Store	Reducers	What are reducers and creating reducers for the app
	Actions	What are actions, dispatching actions, creating actions for the app
	Store	What is store, subscribing to the store and adding store to the project
Redux continued	Currying	Understanding the currying concept in Javascript
	Combining Reducers	How to combine reducers to make the app more efficient
	Middleware	Learning about middlewares and using some with Redux
	Thunk	Using thunk to make async calls to an API
Major Project: Search and Chat	Searching users	Adding functionality to search users
	Building the chat box	Creating the chat using sockets
React Hooks	Use Effect, use State and other	What are hooks, why do we use them and various React hooks out there

Topics	Sub-topics	Details
React and Redux	Context API	What is the context API and how to use it
	HOC	Learning about Higher order components in React
	connect() with Redux	Diving deep into how connect() works in Redux and using react and redux together
Major Project: Setup and Intro	Project setup	Setting up the social media project
	PropTypes	Using PropTypes for props validation
Major Project: Routing and Auth	React router	Adding react router to the project to handle different routes
	Auth in SPA	Understanding how auth works for SPAs
	Form handling	Ways to handle form in React
	User login	Building the user login functionality

# Tools and Techniques

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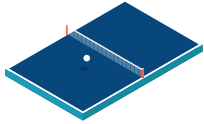


# Projects



## Static Blog

Build the UI of a basic blog using HTML



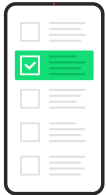
## Ping Pong Game

Build a vintage game, ping pong, using vanilla Javascript



## Mini Contact List

Understand how the backend works and create a contact list by storing the data in a DB



## Todo List App

Build a todo list app using Node.js and express.js



## Shopping Cart

Build the basic functionality of the shopping cart as you see in Amazon and Flipkart



## Movies App

Search any movie and store it as your favourite



## Mini Calculator

Build a calculator web app with Javascript as the core and style it with CSS



## Chatting Engine

Build a basic chat engine using sockets, which enables the users to chat with each other on the website



## Social Media Website

Create a social media website with popular features like post, comment etc using Node.js, Mongo DB and more



## Music Player

Build and style a music player like Spotify/Youtube Music using HTML and CSS



## iPod

Build a clone of iPod nano 5th gen



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