



# COMPLETE GUIDE TO

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# MERN STACK

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(Most Famous Tech Stack)



**'MERN'** is a word that gets thrown around a lot in web development circles. But what exactly does it stand for?

It is a set of four technologies that are used for faster building and deployment of full stack web applications or CRUD (create, read, update and delete) apps.

They are:

**MongoDB:**

A document-oriented cross-platform database

**Express.js:**

A web framework for Node.js

**React:**

A JavaScript library for building user interfaces

**Node.js:**

An cross-platform, open source, JavaScript run-time environment that executes JavaScript code outside of a browser

Web

**React.JS**

Server

**Express.JS**

**Node.JS**

Database

**Mongo.DB**

## MongoDB:

- It is the database used for the full stack web application. It is used to store and update any data that is used by the application.
- MongoDB stores data in binary JSON format, and it is document based. Thus it is very easy to access the indexed files.
- It is open-source, highly scalable and is used to store readily available large volumes of data.

# ExpressJS Framework:

- ExpressJS is simply a framework built on top of Node.js. We use it to simplify the process of writing backend logic and developing many Node modules.
- As an open-source framework, it utilizes JavaScript on the server side. Express.js also supports various middlewares, which make writing code much easier.
- Express.js aids in tasks such as URL routing and handling HTTP requests and responses.

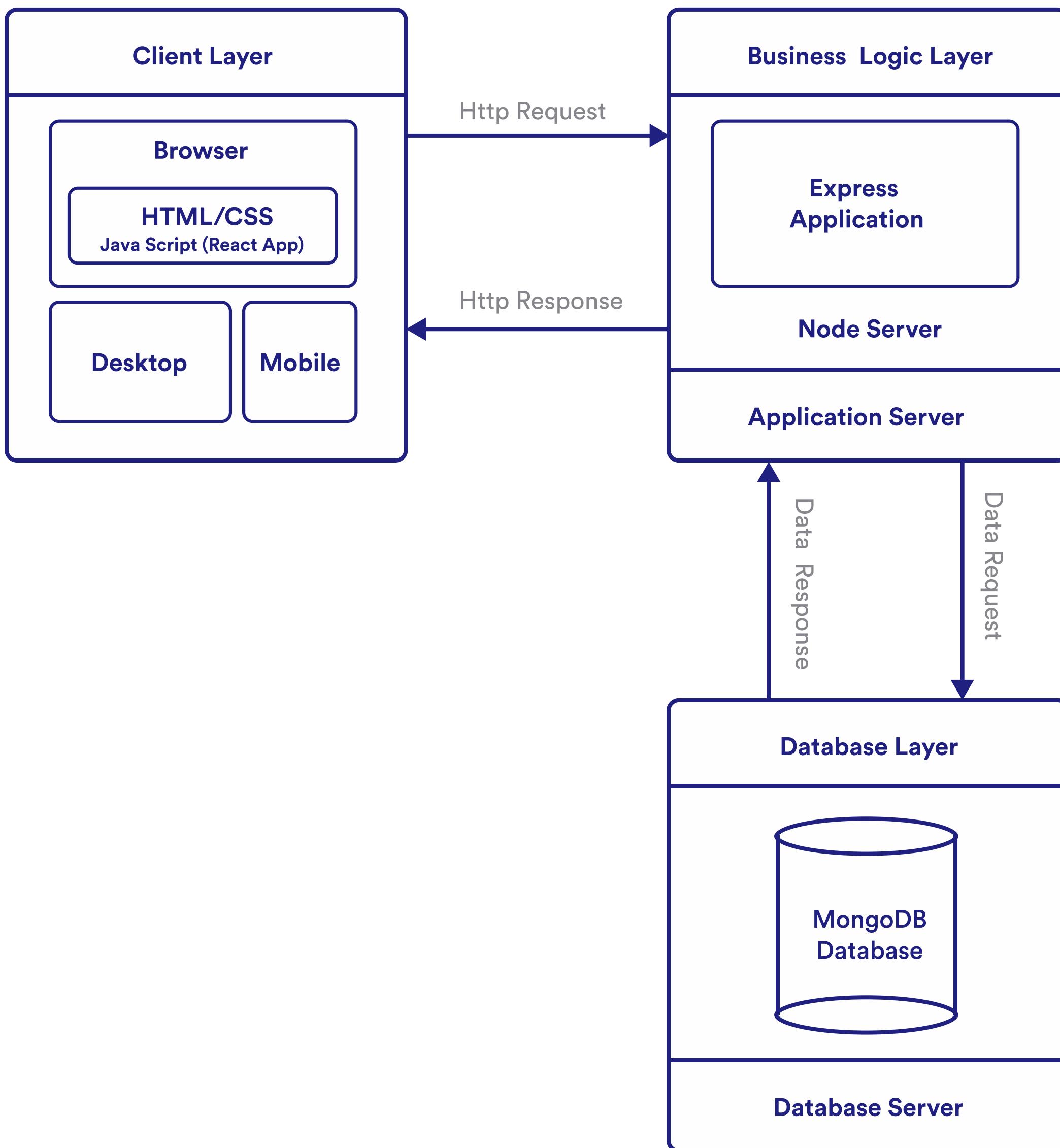
# React JS:

- React.js is a front-end JavaScript library developed by Facebook, primarily used for building user interfaces.
- React is declarative, flexible, and supports the creation of small, isolated, and reusable pieces of code called components.
- Additionally, React Native enables the development of Android or iOS-based mobile apps using JavaScript.
- It is specifically useful in building stateful, data-driven interfaces with minimal code and minimal pain.

# Node JS:

- Node.js is the back-end layer that allows for the execution of JavaScript outside the browser, providing an environment for users to run their code on the server.
- It is cross-platform, open-source and is built on Google Chrome's JavaScript Engine.
- Node.js hosts thousands of public/private packages via NPM (Node Package Manager) to facilitate application development across multiple domains.

# Layers of MERN Stack



# Most MERN Stack applications follow a 3 layer architecture pattern

## Client Layer

- The client layer consists of the web pages which are visible to the client or end user.
- It is developed using React framework along with Javascript, HTML & CSS.

## Application layer

- Acts as the communication layer between client & database layer.
- It contains business logic in the form of an Express application built on the Node.js platform
- Services client requests by fetching appropriate data from the database layer.

## Database Layer

- The MongoDB database operates within this layer
- All the application data required by the client is fetched from this database layer.

## **Basic Working of any MERN Application involves the following steps:**

### **1. User Interaction:**

User interacts with frontend of the application. React components are used to create a dynamic and responsive user interface.

### **2. Client-Server Communication:**

When a user performs an action (e.g., submits a form or clicks a button), the frontend sends an HTTP request to the backend via API endpoints created using Express.js.

### **3. Backend Processing:**

The Express.js application, running on the Node.js platform, receives the request and processes it. This may involve applying business logic, input validation, and/or authentication and authorization checks.

## 4. Database Interaction:

If the request requires data storage or retrieval, the backend communicates with the MongoDB database. MongoDB stores data in a flexible, JSON-like format called BSON, making it suitable for handling various data types and structures.

## 5. Response Formation:

Once the backend processing is complete and any required data has been fetched or stored, the server forms an appropriate response, usually in JSON format, and sends it back to the client.

## 6. Frontend Update:

The React frontend receives the response and updates the user interface accordingly, providing feedback to the user or displaying the requested data.

This process continues as users interact with the MERN application, with the different layers working together to provide a seamless and efficient user experience.

## **Advantages of using MERN stack when developing applications**

### **1. Single Language Stack:**

MERN enables developers to use JavaScript throughout the entire stack, frontend to backend, simplifying the development process and reducing the need to learn multiple languages.

### **2. Reusable Components:**

React uses a component-based architecture, allowing developers to create reusable components that can be easily integrated into different parts of the application. This promotes consistency and speeds up development.

### **3. High Performance:**

React's virtual DOM enhances application performance by minimising DOM manipulations and reducing the need for full-page refreshes. Node.js provides non-blocking, event-driven I/O operations, which improves server-side performance.

## 4. Scalability:

The MERN stack is designed to build scalable applications. Node.js is lightweight and efficient, while MongoDB is a highly scalable, document-based database that can handle large volumes of data.

## 5. Active Community & Ecosystem:

All components of the MERN stack have active and supportive communities, which contribute to ongoing improvements, extensive documentation, and a wide range of third-party libraries and tools.

## 6. Flexibility & Modularity:

MERN provides a modular and flexible architecture, making it easy to add, remove, or modify components as needed. This facilitates easier maintenance and enhances adaptability to changing requirements.

## 7. Open Source:

All technologies in the MERN stack are open-source. This helps reduce development costs and ensures that developers have access to a wealth of resources and support.

# ABOUT BOSSCODER

Bosscoder is an online upskilling platform for techies. We help learners upskill in tech roles to get them placed at top tech companies. We do so through our structured & mentored program designed by industry experts.

## USP of our program include:

### ✨ **STRUCTURED CURRICULUM:**

Covers everything you need to get placed at top tech companies: Problem solving in DS & Algo, CS Fundamentals, System Design (HLD + LLD), Full stack Projects

### ✨ **LIVE CLASSES:**

An active learning classroom program taught by engineers working at companies like Microsoft, PayPal, Amazon

### ✨ **1:1 MENTORSHIP & MOCK INTERVIEWS:**

Personal mentors from top tech companies help you provide the right guidance, feedback, and support.

### ✨ **24/7 DOUBT SUPPORT:**

Through our army of Teaching Assistants

### ✨ **INDUSTRY-RELEVANT PROJECTS:**

Full stack specialization with Industry-relevant projects

### ✨ **PLACEMENT SUPPORT:**

Providing opportunities to tech engineers in eminent startups & top tech companies.

# BUILD YOUR CAREER WITH US

-  **750+** Alumni placed at Top Product-based companies.
-  Highest package of **86 LPA**
-  Average package of **24 LPA**.
-  Resume reviewed and interview scheduled for **1000+** students



**Lakshmi susmitha**  
Software Engineer II, JP Morgan

## Service Based to JP Morgan in 4 months

From a tier-3 college to working in service-based companies, my thirst to join a product-based company didn't go away. BossCoder helped me provide a very detailed path from coding to system design. The way of teaching, and 1:1 mentorship helped me a lot.

Before  
**IBM**  
Application Engineer



After  
**JP Morgan**  
Software Engineer II



**Dheeraj Barik**  
Software Engineer 2, Amazon

## System Engineer at Service Based to SDE 2 at Amazon

Working in Infosys, I was looking for a platform to prepare for interviews of product-based companies. I found BossCoder has a highly structured program covering DSA, System Design etc. in detail. Top-quality instructors and mock interviews proved helpful for me.

Before  
**Infosys**  
Systems Engineer



After  
**Amazon**  
SDE 2



**Vishal Srivastava**  
Software Developer, Barclays

### Service Based to London Based Bank

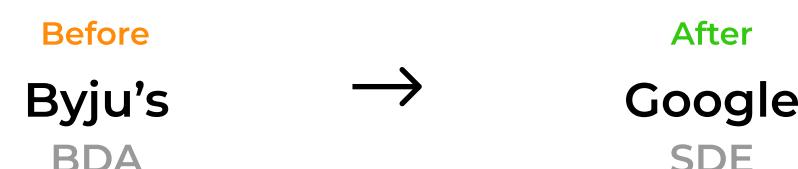
Doing self-prep, I couldn't even pass online assessments of Top companies. But the change BossCoder Academy brought into my preparation is phenomenal. Crucial topics taught in Live classes like DSA, HLD, and LLD, and my personal mentor's guidance ensured I clear my dream company.



**Ujesh Nada**  
Software Development Engineer, Google

### Business Development Associate to SDE at Google

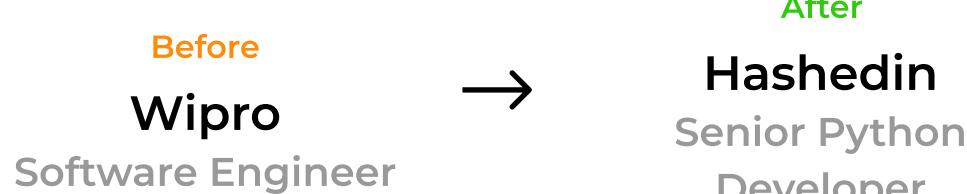
I self-prepared DSA for 8 months, without any results. I joined BossCoder Academy since I wanted to be mentored by industry experts, and it proved to be a great decision for my DSA and System Design preparation. Their 1-on-1 mentor sessions and Live classes helped me transform my career.



**Rakesh Kumar Satapathy**  
Sr. Developer, Hashedin

### Bsc. Graduate stuck in service based to Hashedin

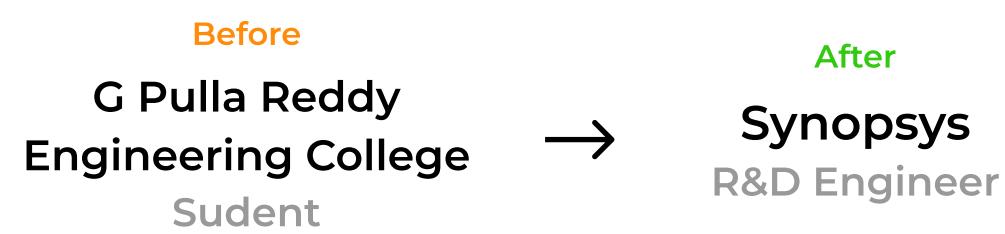
Stuck in a service-based company with no exposure, I always believed that I can realize my dream life, but didn't know how. BossCoder Academy showed the right path to coding geek inside me. Their world-class curriculum and personal mentorship enabled me to switch to my dream role.



**Harshith Ravinoothala**  
R&D Engineer 1, Synopsys

### Tier 3 College Student to Product Based Company

I always wanted to get into a product based company, but being a tier 3 college student lacked exposure to coding. BossCoder Academy helped me gain confidence in DSA and core subjects like OS, DBMS and System Design. Instant Mentor support helped me stay clear of doubts.

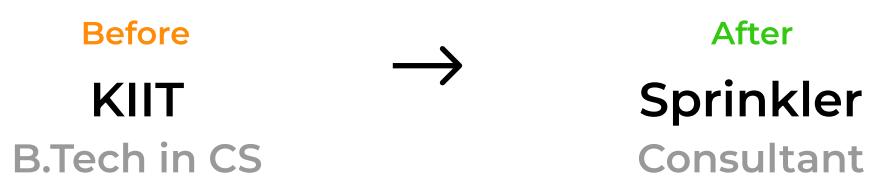




**Sarveshwar Neogi**  
Consultant, Sprinkler

### Clueless college student to Consultant at Sprinkler

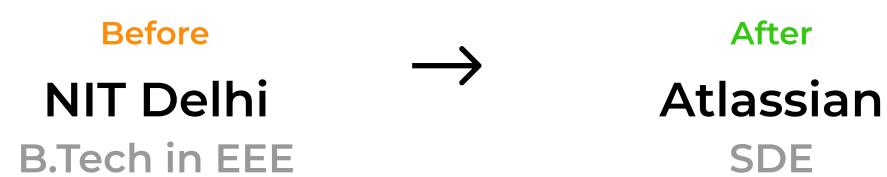
I was wasting my time in college, with no idea how to improve my coding skills. The structured roadmap provided by BossCoder transformed me into a Tech Rockstar. In-depth live lectures and daily handpicked questions helped me become consistent in problem-solving.



**Aarushi Jain**  
Software Development Engineer, Atlassian

### No interest in coding to SDE at Atlassian

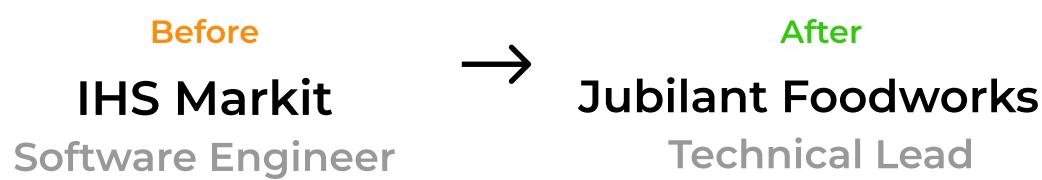
My journey in college was a roller coaster ride, and I wasted lots of time in learning from free resources. BossCoder Academy's excellent curriculum helped me become consistent and invest my efforts in the right direction. With my mentor's guidance, I received offers from Amazon and Atlassian.



**Sumedha Khandelwal**  
Technical Lead at Jubilant Foodworks

### Scared of Technical Interviews to Technical Lead

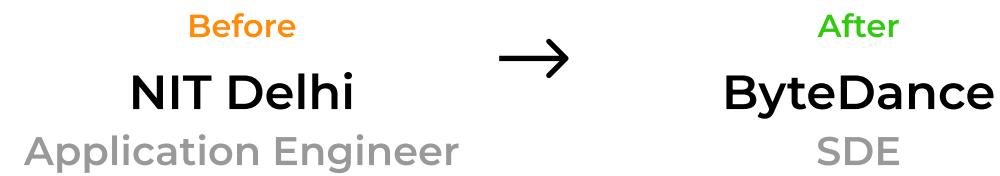
Having 7 years of experience, I always believed there is more to achieve in my career but failed in technical interviews. BossCoder helped me gain confidence to face technical interviews and I received many offers. Mock interviews and mentor feedback helped a lot.



**Irshad K**  
Software Engineer, ByteDance

### NIT Delhi to SDE in Singapore

I am among those talented students who require proper guidance to prosper. Cracking ByteDance was possible due to the guidance of my personal mentor at BossCoder Academy. Their structured curriculum helped me gain confidence in DSA and System Design.





# Want to Upskill?

Go through our website, or email us at  
[ask@bosscoderacademy.com](mailto:ask@bosscoderacademy.com)

**VISIT WEBSITE**  
[www.bosscoderacademy.com](http://www.bosscoderacademy.com)

A screenshot of a laptop displaying the BossCoder Academy website. The left sidebar has a dark blue background with white icons and text: Home, Payment, My Course (highlighted), My mentor, Placement, Calender, Store, Problems, Lead board, Refer Earn, Profile, and Support. The main content area shows a 'My Courses' section with four cards: 'Beginners Lectures' (100% completed, 20/20 problems solved, View Module), 'Advance DSA' (80% completed, 15/20 problems solved, View Module), 'High Level design' (0% completed, 00/20 problems solved, View Module), and 'Low level design' (0% completed, 00/20 problems solved, View Module). On the right, there's a user profile for 'R. Ekunde' with a welcome message, and performance metrics: Points (1856, 15/1000), Streak (32, 32 Days), Solution (64, 64 / 100), and Rating (4.8, 4.8/5). At the bottom, there's a 'Full course context' button for the Advance DSA course.