



COLLEGE CODE : 8203

COLLEGE NAME : A.V.C College of Engineering

DEPARTMENT : B.tech – Information Technology

STUDENT NM-ID : F5E75B782FE75A5B3EC49D5DEFBBF646

ROLL NO : 23IT85

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**Completed the project named as Phase 2
TECHNOLOGY PROJECT NAME : To-Do App with
React Hooks**

SUBMITTED BY,

Name : RAJA ELAMPARITHI S

MOBILE NO : 93427 24039

Tech Stack Selection

The choice of technologies ensures scalability, maintainability, and performance.

Frontend (ReactJS + Hooks):

- React provides a component-based architecture for reusable UI.
- Hooks (useState, useEffect) simplify state management and lifecycle handling.
- TailwindCSS for responsive and modern UI styling.

Backend (Node.js + Express):

- Node.js handles asynchronous, non-blocking operations.
- Express.js simplifies REST API creation, middleware usage, and routing.

Database (MongoDB):

- NoSQL document-oriented storage for flexibility.
- JSON-like documents match API responses directly.
- Indexed by timestamps for faster retrieval of recent tasks.

Additional Tools:

- **Postman** – API testing and debugging.
- **GitHub** – version control and collaboration.
- **Vercel/Netlify** – frontend hosting.
- **MongoDB Atlas** – managed cloud database.

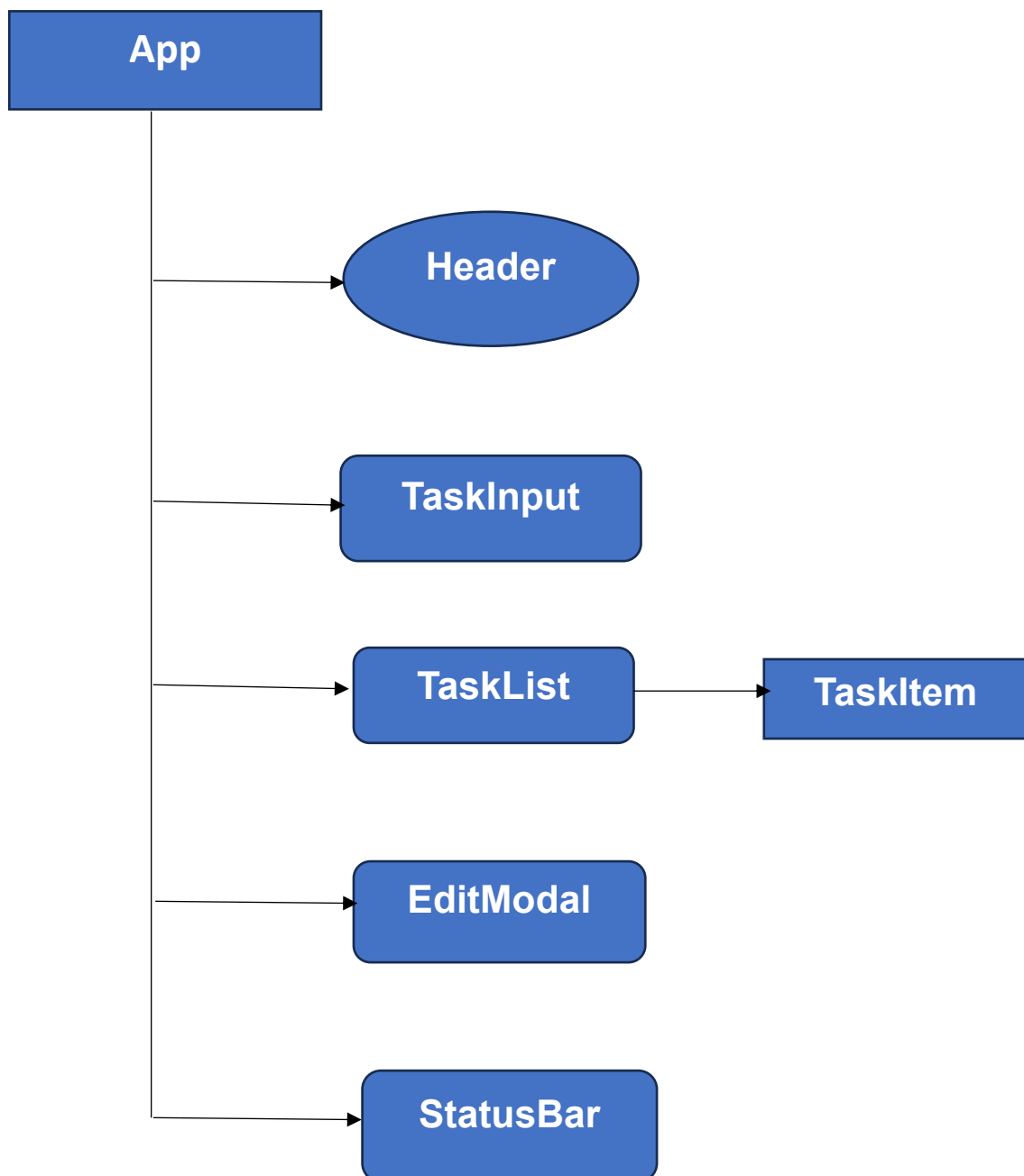
UI Structure

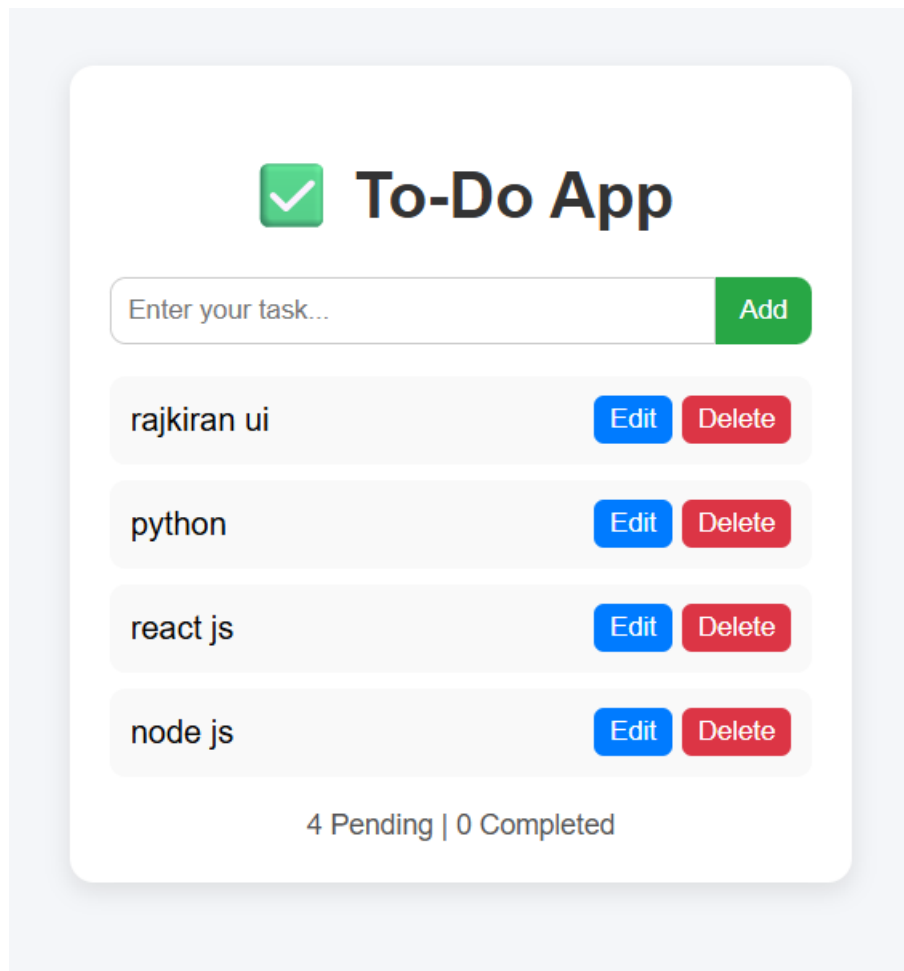
The UI is designed to be simple, responsive, and intuitive.

Main Screens:

- ✓ **Dashboard:** Shows list of tasks.
- ✓ **Task Input Section:** Add new tasks.
- ✓ **Edit Modal:** Update task details.
- ✓ **Delete Confirmation Popup:** Prevents accidental deletion.
- ✓ **Status Bar:** Shows pending vs completed tasks.

Component Hierarchy (React):





API Schema Design

The **API** is built using REST principles with clear endpoints.

MongoDB Schema (Task Model):

```
{  
  "_id": "ObjectId",  
  "title": "string",  
  "completed": "boolean",  
  "createdAt": "Date",  
  "updatedAt": "Date"  
}
```

API Endpoints:

- **GET /api/tasks** → Fetch all tasks
- **POST /api/tasks** → Add a new task
- **PUT /api/tasks/:id** → Update task details
- **PATCH /api/tasks/:id** → Mark complete/incomplete
- **DELETE /api/tasks/:id** → Delete a task

Data Handling Approach

Frontend (React):

- Uses useState for local state management.
- Uses useEffect to fetch tasks on page load.
- Axios/Fetch API for CRUD operations.
- Optimistic updates for real-time feedback.

Backend (Node + Express):

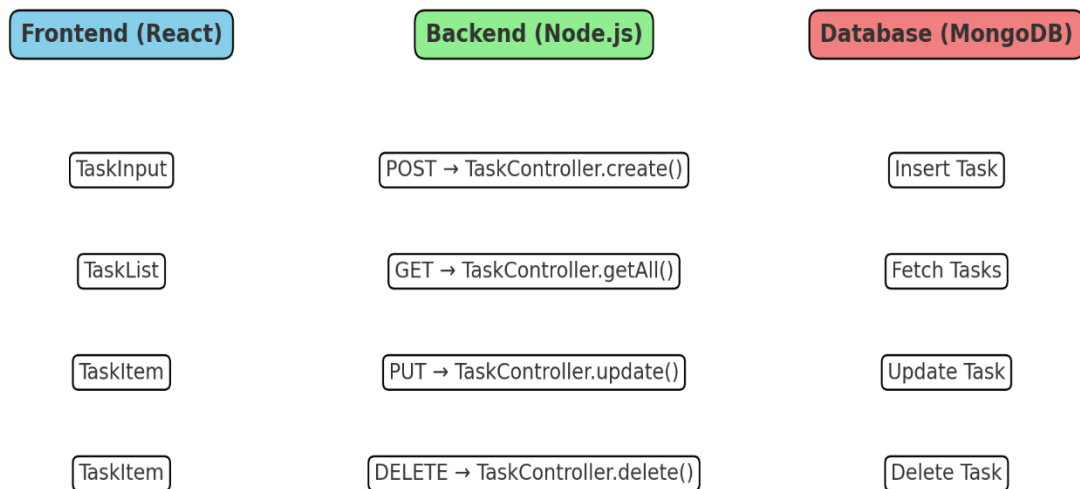
- Request validation with middleware.
- Controller functions handle CRUD.
- Error handling with HTTP status codes.

Database (MongoDB):

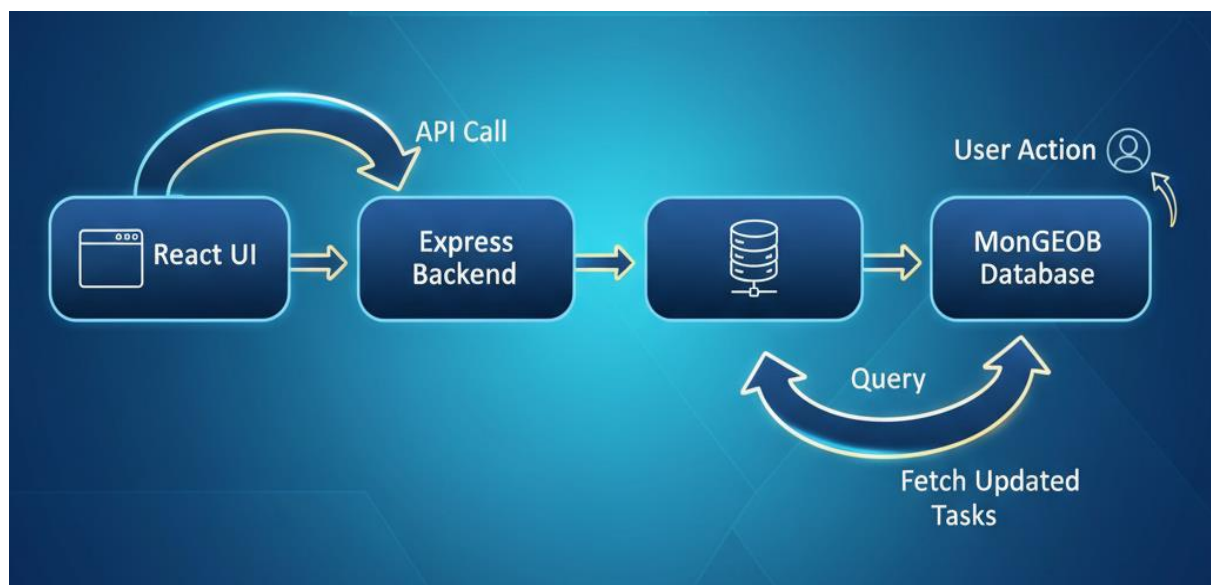
- Tasks stored in collections.
- Indexed by createdAt for fast retrieval.
- Auto-managed _id for unique identification.

Component / Module Diagram

Frontend - Backend - Database Module Flow



Flow Diagram



Expected Outcomes

- ✓ A **clear architecture blueprint** for frontend, backend, and database.
- ✓ **API contracts** well-defined for integration.
- ✓ **UI layout & wireframes** aligned with user needs.
- ✓ **Data handling strategy** ensures smooth task updates.
- ✓ **Flow diagrams & component diagrams** created for team clarity.