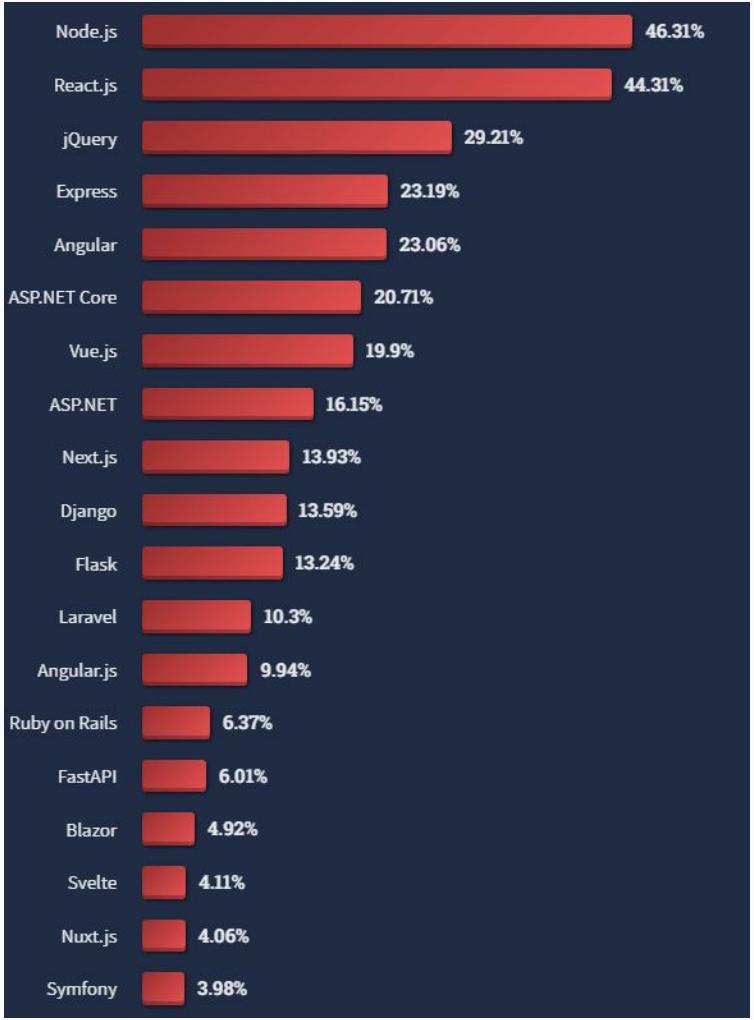
MERN stack

Popularity, CRUD operations and use cases.

POPULARITY

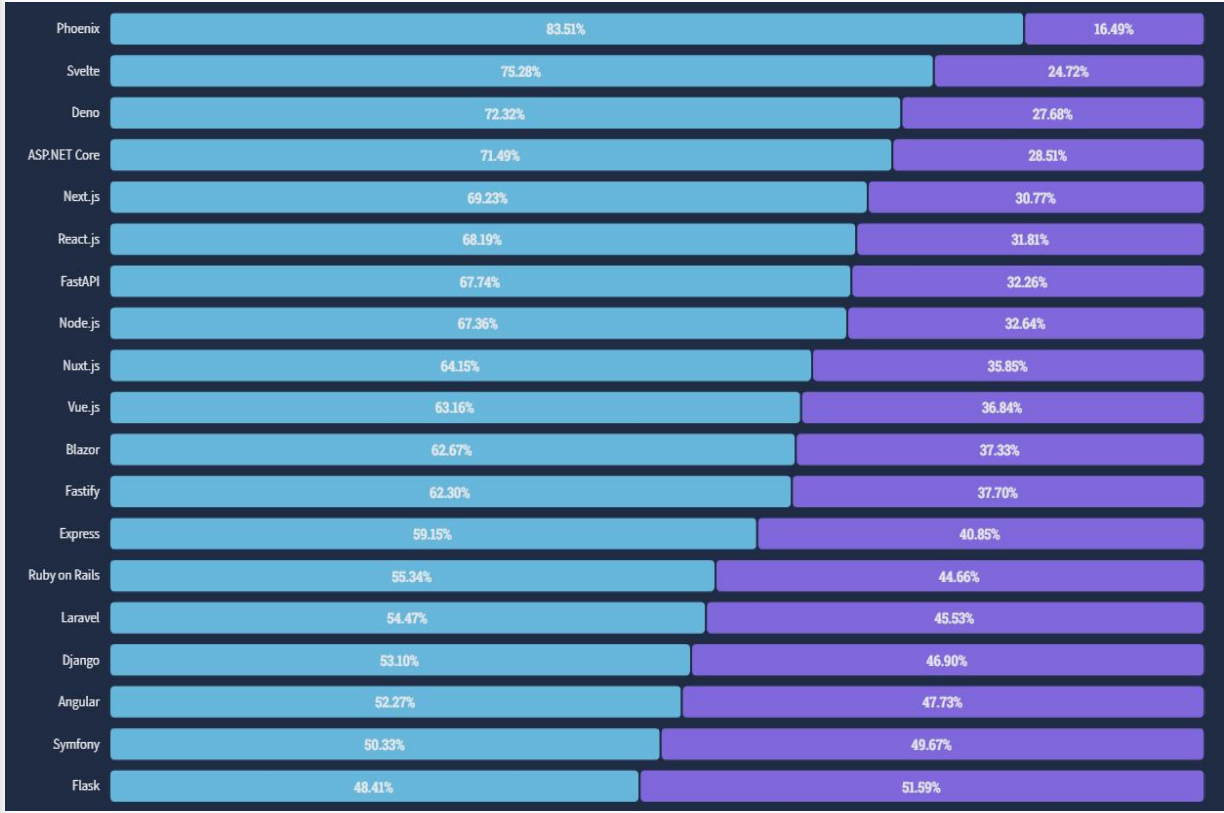
The Stack Overflow dev survey for 2022.

The graph on the right displays the web technologies mostly used in the industry by professional ONLY developers for the current year.



The Stack Overflow dev survey for 2022.

The Loved (Blue) vs Dreaded (Purple) graph.



The Stack Overflow dev survey for 2022.

Technologies that devs show interest in.

PROS AND CONS OF MERN

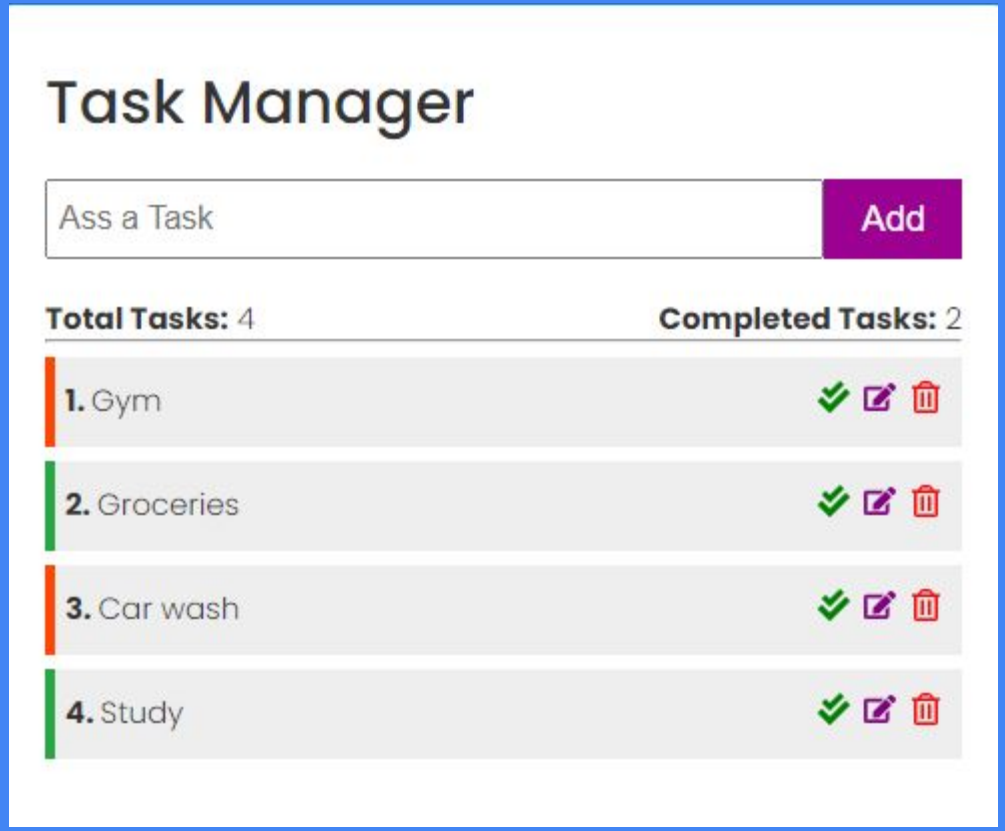
Pros of the MERN stack

- Quick and cost efficient compared to traditional servers.
- Progressive Web Apps (PWAs) with all in one codebase (like Flutter).
- Fullstack applications (better for smaller codebases).
- Fast and interactive applications with modern state management (eg. Redux).
- Variety of external packages to use.
- Easy to learn and get used to.

Cons of the MERN stack

- React is a library - not a framework, thus third party libraries might be needed in the development.
- Big teams do not seem to operate well on this stack.
- You need external libraries for almost everything (e.g. secure of your HTTP requests), due to lack of a framework (although react frameworks like Next.js seem to be rising in popularity).
- Sometimes configurations of external libraries might lead to low productivity.

THE WEB APP

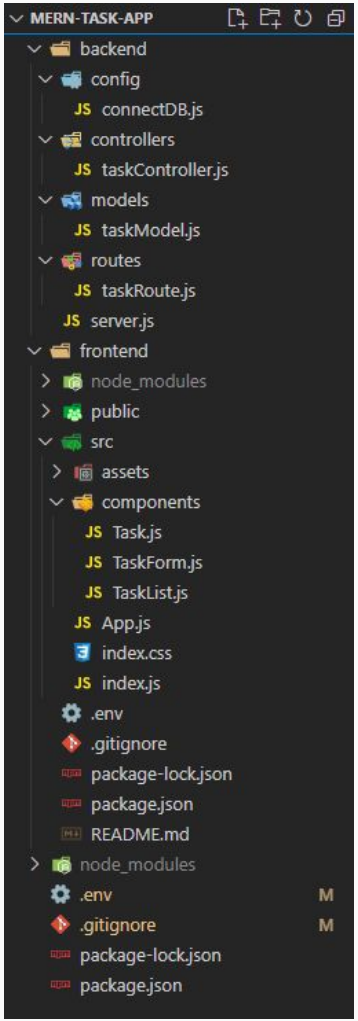

Task Manager
Ass a Task
Add
Total Tasks: 4
Completed Tasks: 2
1. Gym
2. Groceries
3. Car wash
4. Study

MONGO DB

A NoSQL database like Mongo DB.

- Is a non-relational database (like Maria DB).
- Stores documents with key-value pairs instead of tables.
- Offers flexible schemas.
- Fast queries and cost efficienty.
- Good with Big Data and Iot device/sensor data.
- Easy to setup/use and understand.

The project structure



MONGO DB

backend/config/connectDB.js

backend/models/taskModel.js

connectDB.js

backend > config > JS connectDB.js > [@] <unknown>

```
1  const mongoose = require("mongoose")
2
3  const connectDB = async () => {
4      try {
5          const connect = await mongoose.connect(process.env.MONGO_URI)
6
7          console.log(`MongoDB connected: ${connect.connection.host}`)
8      } catch(error) {
9          console.log(error)
10         process.exit(1)
11     }
12 }
13
14 module.exports = connectDB
```

taskModel.js

backend > models > JS taskModel.js > [@] <unknown>

```
1  const mongoose = require("mongoose")
2
3  const taskSchema = mongoose.Schema(
4      {
5          name: {
6              type: String,
7              required: [true, "Please add a task"]
8          },
9          completed: {
10             type: Boolean,
11             required: true,
12             default: false
13         },
14     },
15     {
16         timestamps: true
17     }
18 )
19
20 const Task = mongoose.model("Task", taskSchema)
21
22 module.exports = Task
```

THE BACKEND

Express/Node server setup

backend/server.js

Controller

backend/controller/taskController.js

Routes

backend/routes/taskRoute.js

JS taskRoute.js

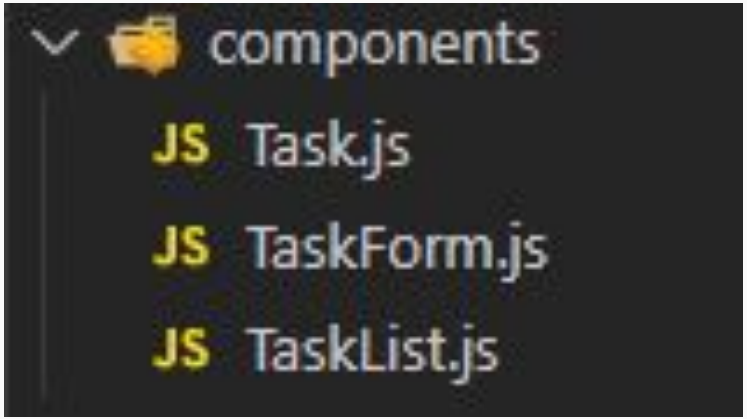
backend > routes > JS taskRoute.js > [@] <unknown>

```
1   const express = require("express")
2   const { createTask, getTasks, getTask, deleteTask, updateTask } = require("../controllers/taskController")
3   const router = express.Router()
4
5   //Create a Task
6   router.post("/api/tasks", createTask)
7
8   // Get Tasks
9   router.get("/api/tasks", getTasks)
10
11  // Get single Task
12  router.get("/api/tasks/:id", getTask)
13
14  // Get single Task
15  router.delete("/api/tasks/:id", deleteTask)
16
17  // Update Task
18  router.put("/api/tasks/:id", updateTask) //update with put --> specify every field --> "name" and "completed"
19
20  module.exports = router
```

THE FRONTEND

React js frontend

- Simple npm create-react-app structure.
- Added the components folder only.



Hooks and state management

frontend/component/TaskList.js

Requests to our API

frontend/component/TaskList.js

```
const getTasks = async (e) => {
    setIsLoading(true)
    try {
        const {data} = await axios.get(`${URL}/api/tasks`)
        setTasks(data)
        setIsLoading(false)
    } catch (error) {
        toast.error(error.message)
        setIsLoading(false)
    }
}

const createTask = async (e) => {
    e.preventDefault()
    if (name === "") {
        return toast.error("Input field cannot be empty")
    }
    try {
        await axios.post(`${URL}/api/tasks`, formData)
        toast.success("Task added successfully")
        setFormData({...formData, name: ""})
        getTasks()
    } catch (error) {
        toast.error(error.message)
    }
}

const deleteTask = async (id) => {
    try {
        await axios.delete(`${URL}/api/tasks/${id}`)
        getTasks()
    } catch (error) {
        toast.error(error.message)
    }
}

const updateTask = async (e) => {
    e.preventDefault()
    if (name === "") {
        return toast.error("Input field cannot be empty.")
    }
    try {
        await axios.put(`${URL}/api/tasks/${taskID}`, formData)
        setFormData({...formData, name: ''})
        setIsEditing(false)
        getTasks()
    } catch (error) {
        toast.error(error.message)
    }
```

The taskList content

frontend/component/TaskList.js

```
return (
    <div>
        <h2>Task Manager</h2>
        <TaskForm name={name} handleInputChange={handleInputChange} createTask={createTask} isEditing={isEditing} updateTask={updateTask}/>
        {tasks.length > 0 && (
            <div className="--flex-between --pb">
                <p>
                    <b>Total Tasks:</b> {tasks.length}
                </p>
                <p>
                    <b>Completed Tasks:</b> {completedTasks.length}
                </p>
            </div>
        )}
    <hr />
    {
        isLoading && (
            <div className="--flex-center">
                <img src={loadingImage} alt="Loading" />
            </div>
        )
    }
    {
        !isLoading && tasks.length === 0 ? (
            <p className="--py">No task added. Please add a task</p>
        ) : (
            <>
            {tasks.map((task, index) => {
                return (
                    <Task key={task._id} task={task} index={index} deleteTask={deleteTask} getSingleTask={getSingleTask} setToComplete={setToComplete}/>
                )
            })}
            </>
        )
    }
    </div>
```

The Task content

frontend/component/Task.js

JS Task.js | JS TaskForm.js

frontend > src > components > JS Task.js > ...

```
1  import {FaEdit, FaCheckDouble, FaRegTrashAlt} from "react-icons/fa"
2
3  const Task = ({task, index, deleteTask, getSingleTask, setToComplete}) => {
4    return (
5      <div className={task.completed ? "task completed" : "task"}>
6          <p>
7              <b>{index + 1}. </b>
8              {task.name}
9          </p>
10         <div className="task-icons">
11             <FaCheckDouble color="green" onClick={() => setToComplete(task)}/>
12             <FaEdit color="purple" onClick={() => getSingleTask(task)}/>
13             <FaRegTrashAlt color="red" onClick={() => deleteTask(task._id)}/>
14         </div>
15     </div>
16   )
17 }
18
19 export default Task
20
```

The TaskForm content

JS TaskForm.js M

frontend > src > components > JS TaskForm.js > default

```
1   const TaskForm = ({createTask, name, handleInputChange, isEditing, updateTask}) => {
2     return (
3       <form className="task-form" onSubmit={isEditing ? updateTask : createTask}>
4         <input type="text" placeholder="Add a Task" name="name" value={name} onChange={handleInputChange} />
5         <button type="submit">{ isEditing ? 'Edit' : 'Add'}</button>
6       </form>
7     )
8   }
9
10  export default TaskForm
11
```

USE CASES

Use cases of MERN stack

- Data intensive apps (eg. iot apps, streaming platforms).
- Smaller codebase apps.
- Interactive and state management intensive apps.
- Single page applications.
- Scalable applications that will be maintained in the future (thanks to npm’s popularity).

and many more…


THANK YOU
FOR THE
YOUR TIME!