Web dev

Foundations

Easy	Medium	Hard
HTML		
CSS		
Bash basics (cd, ls, pwd, mkdir, touch, vi)		
	Bash medium (grep, piping, reverse search)	
Git/Github		
JS Intro, Single threaded nature of JS		
	Async JS, callback queue, event loop	
		Creating promises, Common Promise API methods
Common JS APIs (map, filter, reduce, Object.keys)		

Simple frontend, DOM

Easy	Medium	Hard
Intro to DOM, DOM Tree Structure		
Common DOM APIs (getElementById, getElementsByClassName, querySelector, innerHTML, innerText, getAttribute, setAttribute).		
Event handlers, onClick, stopPropagation,		
localStorage		
	DOM Manipulation, Dynamic frontends	
		Creating a simple reconciler, Foundation for react

Project

1. Pure frontend TODO app using DOM Manipulation

Node.js/Bun/Cloudflare Runtime - Various JS runtimes

easy	medium	hard
What is a JS runtime		
Node.js installation, common APIs		
file system api, fetch.		
External packages, axios vs fetch		
	v8, cf runtime	
		stream, worker threads, cluster module,

HTTP Servers

Simple	Medium	Advance	
What are HTTP Servers			
Methods, routes, URLs, IPs and domains			
	headers, body, query parameters		
	Intro to express, creating routes		
	Middlewares in express		
	File system like DBs		
	Authentication using jwts, basics of jwts		
	Secret management using Doppler		

NoSQL Databases

Easy	Medium	Hard
Intro to Databases		
	SQL vs NoSQL	
MongoDB Intro, getting your first DB		
mongoose, Schemas etc. Simple CRUD		
	Relationships intro	
	Relationsips in Mongo	
	Aggregations in mongo	

SQL Databases

Easy	Medium	Hard
Recap SQL vs NoSQL		
Postgres intro, getting your free	Creating schemas while dealing with SQL databases, CREATE TABLE	
	Creating schemas while dealing with SQL databases, CREATE TABLE	
	SQL queries (CRUD)	
	Indexes	
		Transactions and Concurrency Control
		Normalization
	Sub queries, batch queries	

ORMs

Simple	Medium	Hard
Intro to ORMs		
	Prisma basics, setup, schema generation and CRUD queries	
	Transactions and relationships in prisma	
	Drizzle basics, setup, schema	
	Txns and relationships in drizzle	

React

Revise DOM, foundation of React, why frontend frameworks		
Components in react	useState, useEffect	
Routing in react		Connecting FE to BE
		useRef, useMemo, useCallback
	Custom hooks	
	Context API	
	Intro to state management	
	intro to recoil, atoms and selectors	
		atomFamily, selectorFamily

Styling React apps

Easy	Medium	Hard
Material UI		
	Tailwind	
	Shadcn	

Typescript

Easy	Medium	Hard
TS vs JS, why TS?		
	types in ts	
	interfaces in ts	
		Advance TS APIs (Partial, Exclude ...)

Project

Pure frontend -

1. Gmail clone

Full stack

1. Excelidraw

NextJS

Easy	Medium	Hard
	Why NextJS, SSR vs CSR	
	File based routing	
	Middlewares	
	SSG, ISR	
	Tailwind, shadcn integration	
	API routes	
Data fetching		
	NextAuth, Cookie based auth	
	Internationalization	

Monorepos, Turborepo, lints

Easy	Medium	Hard
What is linting		
	Prettier, eslint	
		pre commit hooks/husky
		lints in CI
What is a monorepo		
	Basic yarn workspaces monorepo	
What is turborepo		
	Turborepo	

Websockets, rtc

Easy	med	hard
one way vs two way comm		
what are ws, how are they diff from http		
	Creating a websocket server	
	Client side logic to connect to a ws server	
	UDP vs TCP communication, webrtc	
		SFUs and Mediasoup

Project

1. Build a chat app (simple)
2. Build a chess app/other real time game

Testing

Easy	Medium	Hard
Why testing?		
	Unit tests	
		Integration tests
	End to end tests	

Advance backend

Easy	Medium	Hard
	Advance BE communication	
	queues (redis)	
	pub subs (redis/kafka/RabitMQ)	
	Scaling ws, http servers	
	Node.js vs golang vs rust for performance	

More topics

- ZOD
* Serverless BE
- openAPI spec
- Autogenerated clients
- Rate Limiting