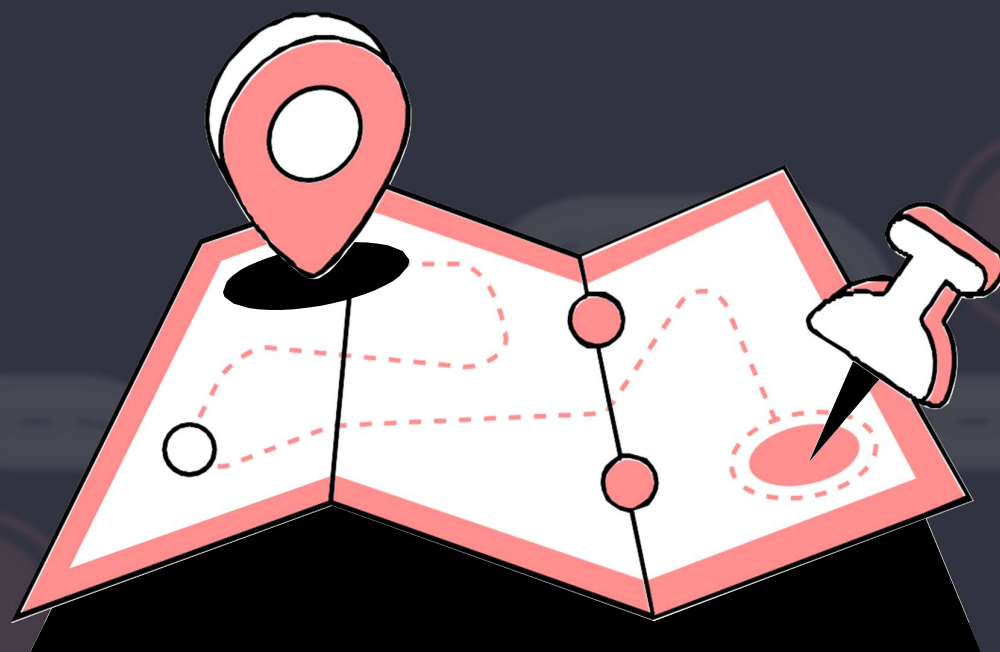
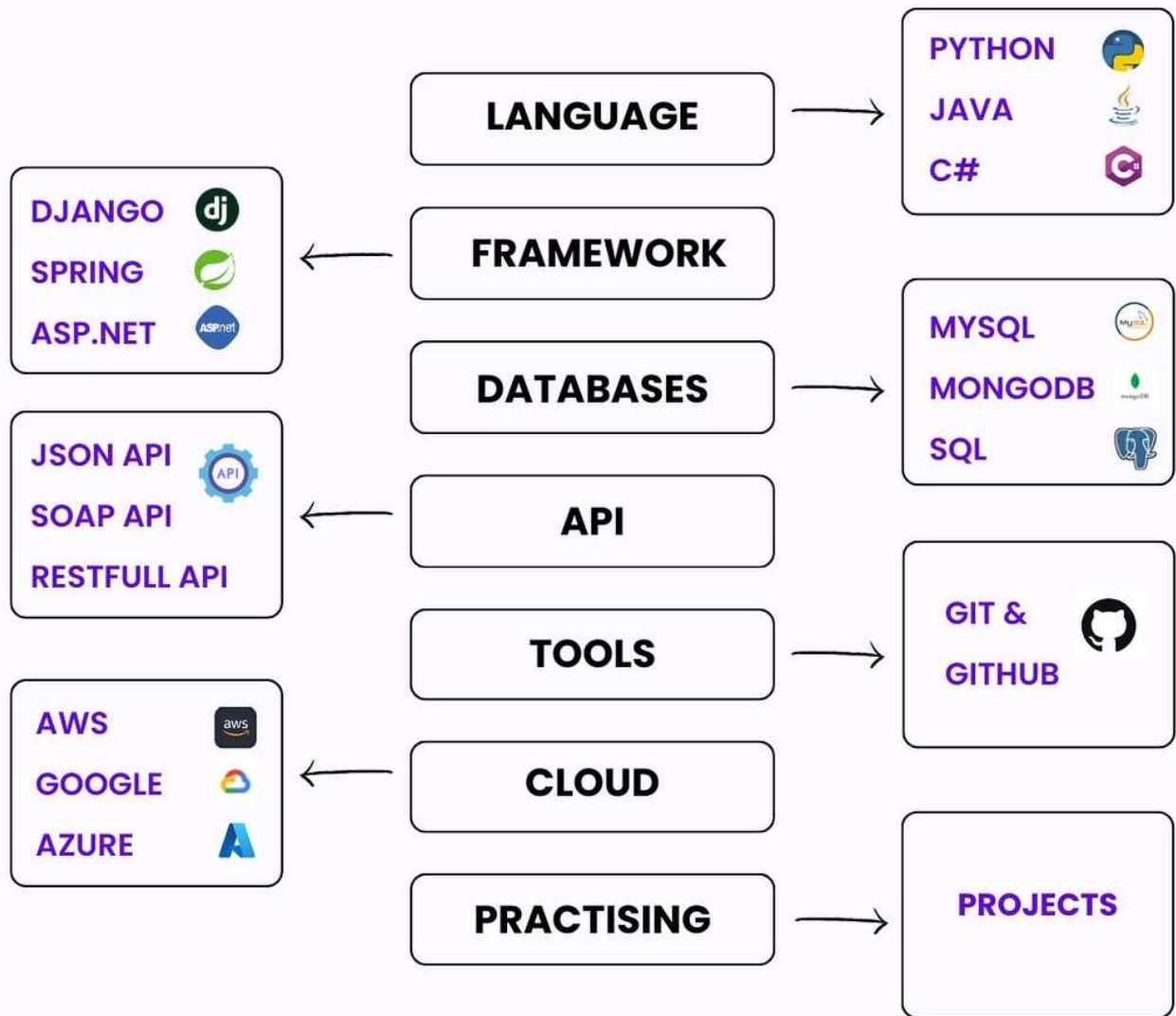


# BACKEND DEV ROADMAP 2025



# MASTERING BACKEND DEVELOPMENT



# BACKEND DEVELOPMENT ROADMAP 2025

## 1. General Knowledge (Foundations)

- How Does the Internet Work?
  - Understand client-server architecture
  - Learn about TCP/IP, routers, switches, and servers
  - Explore how requests travel across the internet
- DNS and How It Works
  - What is DNS (Domain Name System)?
  - Role of DNS in resolving domain names to IP addresses
  - Types of DNS records (A, AAAA, CNAME, MX, etc.)
- HTTP Request/Response Cycle
  - HTTP methods (GET, POST, PUT, DELETE)
  - Headers, status codes, body
  - Difference between HTTP and HTTPS
- Browser Basics
  - Rendering engine, browser storage (cookies, localStorage, sessionStorage)
  - Developer tools: Inspect, Console, Network tab
- Domain Name and Hosting
  - Registering domain names
  - Shared, VPS, Dedicated, Cloud Hosting
  - DNS configuration and SSL certificates

## 2. Basic Front-End (For Backend Understanding)

- HTML
  - Structure of HTML documents
  - Tags, attributes, semantic elements
- CSS
  - Box model, Flexbox, Grid
  - Styling basics: colors, fonts, layout
- JavaScript (Basics)
  - Data types, functions, scope, events
  - DOM Manipulation
  - Fetch API (basic async understanding)

# BACKEND DEVELOPMENT ROADMAP 2025

## 3. Languages & Frameworks (Server-side)

Core Backend Languages:

- JavaScript (Node.js)
  - Non-blocking I/O, event loop
  - npm, Express framework
- Python
  - Syntax, OOP, virtualenv
  - Django (batteries included framework)
- C#
  - OOP principles, .NET Core
  - ASP.NET for MVC and APIs
- PHP
  - Syntax, procedural vs OOP PHP
  - Laravel framework (Routing, Eloquent ORM)
- Java
  - JVM, OOP, Spring Boot framework
- Ruby
  - Syntax, Rails framework (MVC)

Frameworks to Learn:

- Express (JavaScript)
- Django (Python)
- ASP.NET (C#)
- Laravel (PHP)
- Ruby on Rails (Ruby)
- Spring (Java)

# BACKEND DEVELOPMENT ROADMAP 2025

## 4. Databases (Data Management)

- Relational Databases
  - SQL basics, table creation, joins, indexing
  - MySQL, PostgreSQL, MariaDB
- NoSQL Databases
  - MongoDB (Document-based)
  - CassandraDB (Column-based)
  - Redis (Key-Value in-memory store)
  - Firebase (Realtime Database / Firestore)
- ACID Properties
  - Atomicity, Consistency, Isolation, Durability
- ORM (Object-Relational Mapping)
  - Sequelize (Node.js), Hibernate (Java), Django ORM
- Database Concepts
  - Transactions, Triggers
  - Database Normalization

## 5. GIT & Version Control

- What is Git?
  - Version control basics
  - Initialize a repo (git init), check status, staging
- Core Git Commands
  - git add, git commit, git push, git pull
  - Branching, merging, rebasing
  - git clone, git remote, git tag
  - Forking repositories
  - Handling staged vs unstaged changes

# BACKEND DEVELOPMENT ROADMAP 2025

## 6. Web Security & APIs

- Web Security Fundamentals
  - HTTPS, SSL/TLS, CORS, CSRF, XSS
- Authentication & Authorization
  - JWT, OAuth2, Session-based Auth
- APIs
  - REST API Design
  - XML-RPC, SOAP (older), JSON & GSON
  - Encryption: AES, Hashing, Data Integrity

## 7. Containerization & Testing

- Testing Types
  - Unit Testing, Functional Testing
  - Performance & Regression Testing
  - Usability Testing
- Containerization Tools
  - Docker: Images, Containers, Dockerfile, Compose
  - Kubernetes: Pods, Services, Deployments

## 8. Cloud & Deployment

- Service Models
  - SaaS: Software as a Service
  - PaaS: Platform as a Service
  - IaaS: Infrastructure as a Service
- Major Cloud Providers
  - AWS (EC2, S3, Lambda)
  - Google Cloud Platform
  - Microsoft Azure
  - Oracle Cloud, IBM Cloud, Alibaba Cloud
- Deployment & CI/CD
  - CI/CD with GitHub Actions, Jenkins, GitLab CI
  - Hosting with Vercel, Netlify, Heroku, etc.

# Roadmap by: Roadmap.sh

Find the detailed version of this roadmap along with resources and other roadmaps

<https://roadmap.sh>

- 👉 Personal Recommendation / Opinion
- 👍 Alternative Option - Pick this or purple
- 👎 Order in roadmap not strict (Learn anytime)
- 👎 I wouldn't recommend

## Backend

