

## DECEMBER BACKEND & AI LEARNING ROADMAP

### WEEK 1: Core Programming & Backend Basics

- C# refresh (syntax, OOP, small console app)
- ASP.NET Web API basics
- Java refresh (syntax, OOP, mini student manager app)
- Spring Boot REST API
- SOLID principles
- Data structures (lists, stacks, queues)
- Algorithms (sorting & searching)

### WEEK 2: Software Engineering Fundamentals

- SQL fundamentals
- ORM (Entity Framework / JPA)
- JWT authentication
- Clean Code principles
- Git & version control
- Build a small backend system (CRUD + auth)
- Unit testing (JUnit/NUnit)

### WEEK 3: AI Fundamentals + Integration

- AI basics (AI/ML/DL, supervised vs unsupervised learning)
- Python for AI (NumPy, Pandas)
- Build simple ML model
- Intro to neural networks
- Calling AI APIs from backend apps
- Add AI endpoint to your backend
- Final combined project

**FINAL PROJECT:**

- Backend in C# or Java
- Database + ORM
- Authentication
- AI-powered endpoint
- Unit tests
- Hosted on GitHub