📌 STUDY ROADMAP – 1 HOUR PER DAY (ENGLISH)

Objective

To deepen knowledge in software architecture, cloud computing, databases, machine learning, blockchain, advanced software engineering, and information security.

- **Duration: 6 months (can be adjusted according to your pace).**
- **Daily Study Time: 1 hour per day.**

🔹 Month 1 – Software Architecture and Distributed Systems

📖 Study:

- **📘 Book: *Designing Data-Intensive Applications* – Martin Kleppmann – https://www.oreilly.com/library/view/designing-data-intensive-applications/9781491903063/**
- **📄 Article: *The Twelve-Factor App* – https://12factor.net/**
- **📄 Article: *What is Event-Driven Architecture?* – https://microservices.io/patterns/data/event-driven-architecture.html**

🎥 Videos & Courses:

- **🎓 Course: *Distributed Systems – MIT (YouTube)* – https://www.youtube.com/playlist?list=PLUl4u3cNGP63VIBQVWGUx2VuKaB4BvP9K**
- **🎓 Course: *Event-Driven Microservices (Udemy)* – https://www.udemy.com/course/event-driven-microservices/**

🛠️ Practice:
✅ Build a microservice in Go using Kafka for events.
🔗 Example repository: *Golang Kafka Example* – https://github.com/segmentio/kafka-go

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🔹 Month 2 – Cloud, Kubernetes, and Information Security

📖 Study:

- **📄 AWS Fundamentals: IAM, S3, Lambda, EC2, RDS, and DynamoDB – https://aws.amazon.com/what-is/**
- **📄 Kubernetes Basics: Official Documentation – https://kubernetes.io/docs/tutorials/**

- 📄 **Terraform: HashiCorp Documentation – https://developer.hashicorp.com/terraform/docs**

📄 **Information Security:**

- 📄 **Introduction to Information Security and Cybersecurity – https://www.coursera.org/learn/seguranca-da-informacao**
- 📄 **OWASP Top 10: Main Security Vulnerabilities – https://owasp.org/www-project-top-ten/**
- 📄 **Secure Authentication Guide with OAuth 2.0 and JWT – https://oauth.net/2/**
- 📄 **Protection Against AI-Driven Content Analysis and Data Theft:**
  - **Blocking web scrapers and malicious AIs – https://www.cloudflare.com/learning/bots/how-to-block-web-scrapers/**
  - **Data obfuscation techniques and rate limiting – https://portswigger.net/blog/how-to-stop-web-scraping**

🎥 **Videos & Courses:**

- 🎓 **Course: *AWS for Developers (Udemy)* – https://www.udemy.com/course/aws-for-developers/**
- 🎓 **Course: *Docker and Kubernetes (Udemy)* – https://www.udemy.com/course/docker-kubernetes/**
- 🎓 **Course: *Terraform for Infrastructure as Code (Udemy)* – https://www.udemy.com/course/terraform/**
- 🎓 **Course: *Cyber Security Basics – Coursera* – https://www.coursera.org/learn/cyber-security-basics**

🛠️ **Practice:**
✅ **Deploy a local Kubernetes cluster with Minikube.**
✅ **Implement authentication and authorization in an application using OAuth 2.0 and JWT.**
✅ **Set up a CI/CD pipeline with GitHub Actions or GitLab CI.**
🔗 **GitHub Actions CI/CD Guide – https://docs.github.com/en/actions/**
✅ **Implement anti-scraping and AI analysis protection on a website.**

🔹 Month 3 – Databases, Data Streaming, and Database Security

📖 **Study:**

- 📄 **Advanced PostgreSQL: Official Documentation – https://www.postgresql.org/docs/**
- 📄 **NoSQL: DynamoDB vs MongoDB vs Cassandra – https://aws.amazon.com/nosql/**
- 📄 **Kafka Streams: Introduction to Kafka – https://kafka.apache.org/documentation/streams/**

📄 **Database Security:**

- 📄 **Security principles for relational and NoSQL databases – https://www.oracle.com/security/database-security/**
- 📄 **Protecting sensitive data in PostgreSQL and MongoDB – https://www.mongodb.com/docs/manual/security/**

🎥 **Videos & Courses:**

- 🎓 **Course: *Advanced PostgreSQL (Udemy)* – https://www.udemy.com/course/postgresql/**
- 🎓 **Course: *Kafka for Developers (Udemy)* – https://www.udemy.com/course/kafka-for-developers/**

🛠️ **Practice:**
✅ **Write advanced SQL queries in PostgreSQL.**
✅ **Implement encryption in both relational and NoSQL databases.**
✅ **Develop a Kafka consumer-producer in Golang.**
🔗 **Example repository: *Apache Kafka Golang* – https://github.com/confluentinc/confluent-kafka-go**

🔹 Month 4 – Machine Learning and Security in ML

📖 **Study:**

- 📄 **MLOps: Introduction Course – https://www.coursera.org/learn/mlops**
- 📄 **AI APIs: OpenAI API Documentation – https://platform.openai.com/docs/**
- 📄 **LLMs and NLP: Introduction to NLP with Python – https://www.nltk.org/**

📄 **Machine Learning Security:**

- 📄 **Adversarial attacks on ML models – https://arxiv.org/pdf/1708.06939.pdf**
- 📄 **AI privacy and data anonymization techniques – https://arxiv.org/abs/1907.05183**

🎥 **Videos & Courses:**

- 🎓 **Course: *MLOps in Practice (Coursera)* – https://www.coursera.org/specializations/mlops**
- 🎓 **Course: *Deep Learning for Developers (FastAI)* – https://course.fast.ai/**

🛠️ **Practice:**
✅ **Build a chatbot using the OpenAI API.**
✅ **Implement privacy techniques for sensitive data in ML models.**
✅ **Deploy a Machine Learning model using FastAPI + Docker.**

🔹 Month 5 – Blockchain, FinTech, and Blockchain Security

📖 **Study:**

- 📄 **Blockchain Fundamentals: Ethereum and Solidity – https://ethereum.org/en/developers/**
- 📄 **Hyperledger Fabric: Official Documentation – https://hyperledger-fabric.readthedocs.io/en/latest/**

📄 **Blockchain Security:**

- 📄 **Common smart contract attacks and mitigation strategies – https://consensys.net/blockchain-security/smart-contract-best-practices/**
- 📄 **Cryptocurrency wallet security – https://www.coindesk.com/learn/what-is-a-crypto-wallet-and-how-does-it-work**

🎥 **Videos & Courses:**

- 🎓 **Course: *Ethereum and Solidity – Complete Guide (Udemy)* – https://www.udemy.com/course/ethereum-and-solidity-the-complete-developers-guide/**

🛠️ **Practice:**
✅ **Develop and test a Smart Contract in Solidity.**
✅ **Build a decentralized application (DApp) connected to a blockchain.**

🔹 Month 6 – Portfolio Building and Real-World Projects

🛠️ **Practice:**
✅ **Build a distributed system with Kafka and Go.**
✅ **Implement secure authentication and protection against DDoS attacks in a microservice.**
✅ **Develop an AI-integrated application using GPT-4 or Llama 3.**
✅ **Implement anti-scraping and AI analysis protection in a web application.**
✅ **Create a technical portfolio on GitHub to showcase projects.**