Vocational English II (Mesleki Yabancı Dil II) Week 4

12.04.2025

Engineering Faculty

Computeer Engineering

Prepared by: Dr Ercan Ezin

INTRODUCTION

THIS WEEK WE WILL WORK ON

Software Engineering Principles

BLOG POST

TITLE: Top 10 Software Engineering Principles

https://fullscale.io/blog/software-engineering-principles/

INTRODUCTION TO SOFTWARE ENGINEERING PRINCIPLES

- Software engineering is complex and multifaceted.
- Principles help navigate challenges and ensure project success.
- Key benefits: **quality assurance, efficiency, collaboration, maintainability, risk mitigation**.
- Applying principles ensures long-term software success.

WHY SOFTWARE ENGINEERING PRINCIPLES MATTER

Quality Assurance: Reduces defects, improves reliability.

Efficiency & Productivity: Streamlines development, reduces waste.

Collaboration: Ensures clear guidelines for teamwork.

Maintainability & Scalability: Enables long-term modifications.

Risk Mitigation: Identifies and resolves issues early.

PRINCIPLE #1 – KISS (KEEP IT SIMPLE, STUPID)

Simplicity is key to maintainability and readability.

Avoid unnecessary complexity.

Clean, concise, and readable code improves efficiency.

PRINCIPLE #2 & #3 – DRY & YAGNI

2- DRY (Don’t Repeat Yourself): Avoid redundancy, promote modular design.

- Code reuse enhances efficiency and reduces errors.

3-YAGNI (You Aren’t Gonna Need It): Only implement required features.

- Prevent over-engineering and unnecessary functionality.

PRINCIPLES #4 & #5 – SEPARATION OF CONCERNS & MODULARITY

4-Separation of Concerns: Break software into **independent modules**.

- Each module should have **a clear responsibility**.

5-Modularity: Software should be a **collection of reusable, self-contained modules**.

- Enables **easy modification, testing, and scalability**.

PRINCIPLES #6 & #7 – SRP & OCP

6-Single Responsibility Principle (SRP): Each module, class, or function should have **only one responsibility**.

- Prevents mixing multiple concerns in a single unit.

7-Open-Closed Principle (OCP): Software should be **open for extension but closed for modification.**

- Encourages using **abstractions and interfaces** for flexibility.

PRINCIPLES #8, #9 & #10 – LSP, ISP & DIP

8-Liskov Substitution Principle (LSP): Subtypes must be substitutable for base types without affecting functionality.

9-Interface Segregation Principle (ISP): Clients should not depend on unused interfaces.

Use **smaller, more specific interfaces**.

10-Dependency Inversion Principle (DIP): High-level modules should depend on abstractions, not concrete implementations.

Encourages **dependency injection** to improve flexibility.

BENEFITS OF APPLYING THESE PRINCIPLES

Higher Software Quality: Fewer defects, better performance.

Increased Productivity: Faster development cycles.

Better Collaboration: Shared understanding improves teamwork.

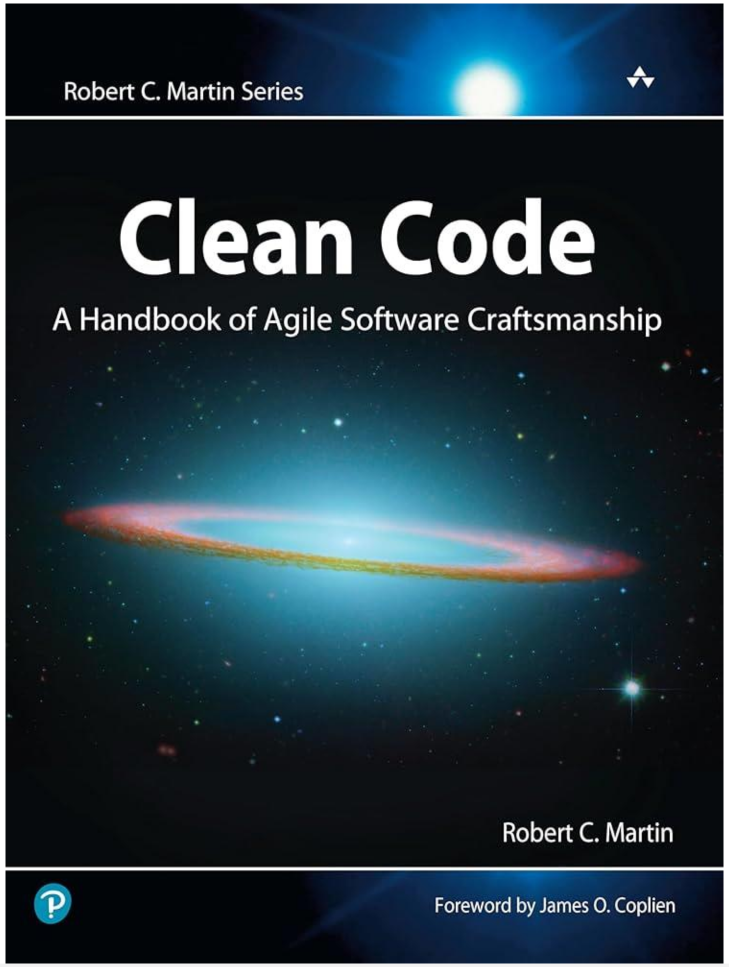
Reduced Technical Debt: Easier to maintain and scale.

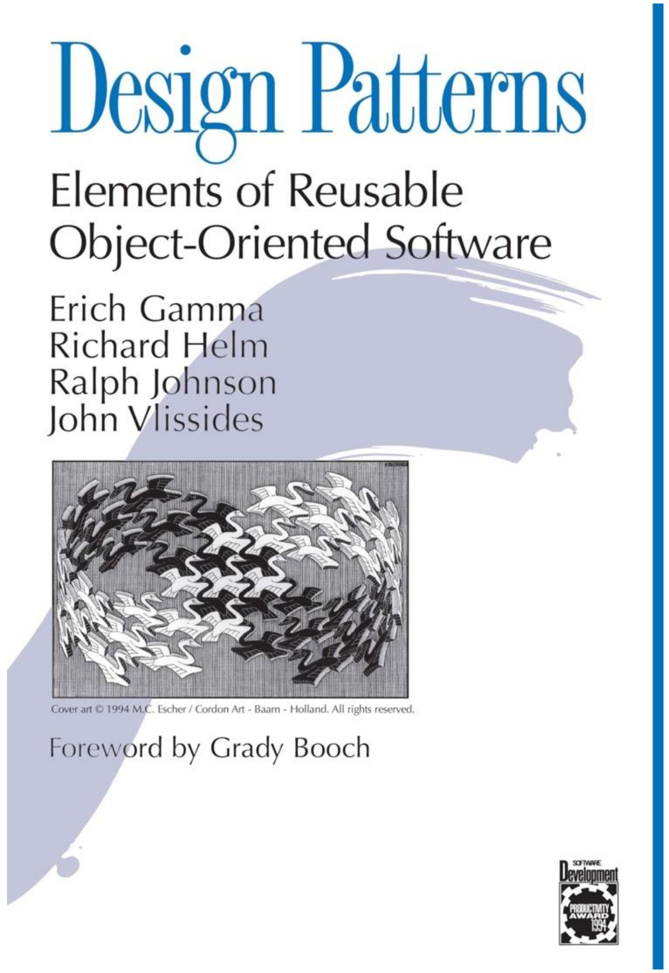
Greater Agility: Adaptability to changing requirements.

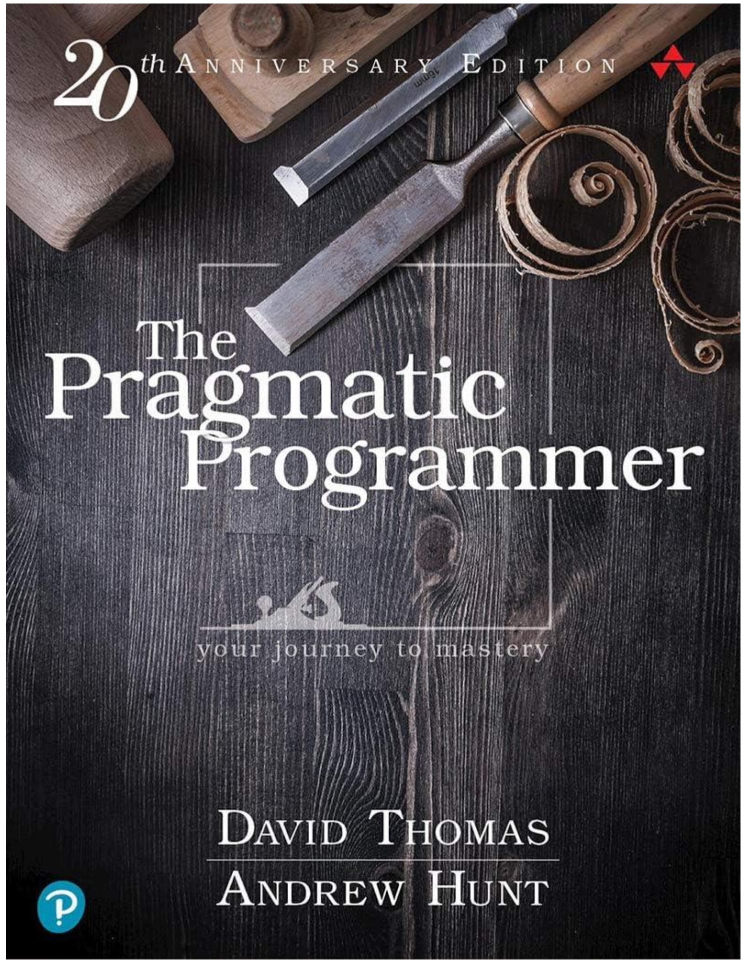
Cost Savings: Minimized rework and optimized resources.

LISTENING ACTIVITY

https://www.youtube.com/watch?v=V3TUEeB0kW0


Robert C. Martin Series
Clean Code
A Handbook of Agile Software Craftsmanship
Robert C. Martin
Foreword by James O. Coplien


Design Patterns
Elements of Reusable Object-Oriented Software
Erich Gamma
Richard Helm
Ralph Johnson
John Vlissides
Cover art © 1994 M.C. Escher / Cordon Art - Baarn - Holland. All rights reserved.
Foreword by Grady Booch



BOOK RECOMMENDATIONS

WORDS OF THE WEEK

1. **Abstraction** – Hides implementation details.
2. **Encapsulation** – Bundles data and methods.
3. **Cohesion** – Degree of module focus.
4. **Coupling** – Dependency between modules.
5. **Scalability** – Handles growth efficiently.
6. **Maintainability** – Easy to modify software.
7. **Reusability** – Use components multiple times.
8. **Modularity** – Divide system into modules.
9. **Robustness** – Handles errors gracefully.
10. **Extensibility** – Allows feature expansion.
11. **DRY (Don't Repeat Yourself)** – Eliminates redundancy.
12. **KISS (Keep It Simple, Stupid)** – Avoids unnecessary complexity.
13. **YAGNI (You Aren't Gonna Need It)** – Prevents over-engineering.
14. **Single Responsibility Principle (SRP)** – One job per module.
15. **Open-Closed Principle (OCP)** – Extend without modifying.
16. **Liskov Substitution Principle (LSP)** – Maintain type compatibility.
17. **Interface Segregation Principle (ISP)** – Small, specific interfaces.
18. **Dependency Inversion Principle (DIP)** – Depend on abstractions.
19. **Agile Development** – Iterative, flexible development.
20. **Technical Debt** – Future code maintenance burden.

PS: Keep a journal where you note these words with their meanings and usages in a sentence.

EOF*

*End of Fun/File