Introduction to
Software Craftsmanship

Summary

“In spite of the rise of Microsoft and other giant producers, software remains in large part a craft industry. Because of the enormous variety of specialized applications, there will always be room for individuals to write software based on their unique knowledge. There will always be niche markets to keep small software companies alive. The craft of writing software will not become obsolete. And the craft of using software creatively is flourishing even more than the craft of writing it.” [1]

- Freeman Dyson [2]

This document outlines a course which aims to venture into the world of modern software development with special focus on *“Craftsmanship over Crap”,* while introducing the underlying technologies as we go. It is a proposed guideline, not the word of a deity. I invite you to add, modify and delete anything you see fit.

[1] Software Craftsmanship: https://en.wikipedia.org/wiki/Software_craftsmanship
[2] Freeman Dyson: https://en.wikipedia.org/wiki/Freeman_Dyson

Mark Sumegi, 2020 September

Course Outline

1. Intermediate Python (warmup)
    - Itertools
    - Lambda functions
    - Logging
    - Decorators
    - Generators
    - Multithreading
    - Context managers
    - List comprehension

Links

- Intermediate Python Programming Course
- Laziness in Python - Computerphile
- Recursion - Towers of Hanoi

2. Object Oriented Programming
    - Refreshing Java
    - Classes and Objects
    - Visibility
    - Getters, Setters and Constructors
    - Inheritance
    - Polymorphism
    - Interfaces
    - UML diagrams
    - Design and practice

Links

- MIT Object Oriented Programming
- OOP in Java

3. Clean Coding 1

- Meeting Uncle Bob
- SOLID principles

Links

- Wikipedia: SOLID
- Clean Code - Uncle Bob / Lesson 1
- Clean Code - Uncle Bob / Lesson 2

4. Testing

- Unit testing
- TDD

Links

- JUnit 5 Basics

5. Intro to Databases

- Relational Databases
- SQL
- SQLite with Python
- Other databases

Links

- SQL Tutorial - Full Database Course for Beginners
- SQLite Databases With Python - Full Course

6. Intro to Networks and APIs

- The internet
- TCP/IP
- HTTP
- REST
- CRUD

Links

- What is TCP/IP?
- APIs for Beginners

7. Server Side JAVA
    - Create a server in Java
    - The Spring framework
    - Spring Boot
    - Creating a RESTful API and practice

Links

- Create Your Own Hello World Server
- What is the Spring framework really all about?
- Spring Boot Quick Start

8. **Project work**

9. SW development practices
    - Waterfall v-model,
    - Agile
    - Scrum
    - Xp
    - kanban

10. Frontend technologies
    - HTML
    - CSS
    - JavaScript
    - React

Links

- udemy

11. Integration and Delivery
    - VM on aws or gcp
    - Continuous Integration with Travis
    - Deployment on Heroku
    - Containerization with Docker

Links

- What is Containerization?

12. Security

- HTTPS
- SQLI
- XSS

Links

- avatao

13. Clean Coding 2 and Design Patterns

- Software architecture
- Useful Design Patterns

Links

- Udemy

14. Advanced Language Elements and Tricky Interview Questions

- Streaming
- Exception handling
- Garbage collection
- Everything else

Links

- Interview questions

15. Microservices

- Spring Cloud

Links

- Spring Boot Microservices

16. Machine Learning

- Data Science 101
- Unsupervised Learning
- Supervised Learning
- Neural Networks

- TensorFlow: Cats vs. Dogs
- Map reduce

Links

- sentdex