**Assignment 1 – Introduction To Software Development**

**CSC 300 Spring 2024**

Notes: All homework must be submitted via e-mail.

E-mail address is:

[csc300csudh@gmail.com](mailto:csc300csudh@gmail.com)

The homework file should be submitted with your name using the following format:

**RosenthalH\_AZ.docx**, where **Z** is the assignment number. Note: use your name, not mine

**Total Points - 81**

**Short answer questions.**

1. List and describe 5 key practices in Software Development (15 points)

-Good design and definition of interfaces, automated, testing, continuous integration, Low complexity, and good documentation

1. Describe refactoring. (4)

-Improving the software without adding new functionality

1. List three characteristics of good naming conditions, as defined by Robert Martin. (6)

* -Self explanatory, meaningful distinctions, pronounceable.

1. List 5 good coding practices for Java programmers. (10)

* Defining and adhering to naming conventions, Ordering class members by scope, class members should be private, avoid empty catch blocks, Use enum or constant class instead of Constants interface

1. How can an external class modify the private variable of a separate class? (4)

* Mutator methods can be used to change private data.

1. Why are StringBuilder objects better for concatenation than String objects? (4)

* Because string objects are immutable

1. Define Static Program Analysis (4)

* Programs or algorithms designed to extract facts from another program’s source code without executing it.

1. Why do we want to keep code complexity low? (4)

* Low complexity makes the code must easier to test and maintain. The higher the complexity the more difficult it is to maintain.

1. What is cyclomatic complexity and how is it calculated? (8)

* Measures how complex your code is. Quantitative measure of the number of linearly independent paths through program’s source code

1. List 7 advantages of functional programming. (7)

* Optimum Transparency, Validating Functional Signatures, Static Variables, Seamless Parallel Programming , Lazy Evaluation, Enhanced Readability, Use of Pure Functions

1. Describe lazy evaluation. (5)

* Evaluation strategy which delays the evaluation of an expression until its value is needed and which also avoids repeated evaluation

**Problems:**

1. **Cyclomatic Complexity (10 points)**

Calculate the cyclomatic complexity for the following figure, assuming a single exit after node 7. Show your formula and calculation to ensure partial credit.

A diagram of a network

Description automatically generated

e = 8

n = 7

p = 1

M = E – N + 2P

M = 8 – 7 + 2(1)

M = 3