**Quiz 1**

**CSCI 5801: Software Engineering 1**

**Fall 2018**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X500: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I understand that I can only use 1 page of notes (front and back) for this quiz. I cannot use any electronics, additional notes, or books. I will ensure my cell phone is not visible during the quiz and that I do not share my answers with anyone. There are a total of 4 problems to be answered. I will turn in all quiz sheets when the quiz is completed. I do not need to turn in my 1 page of notes.

Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
|  | Possible Points | Your Points |
| 1 | 15 |  |
| 2 | 10 |  |
| 3 | 12 |  |
| 4 | 15 |  |
| Totals | 52 |  |

Problem 1 (15 points): The systematic approach used in software engineering is sometimes called a software process. A software process is a sequence of activities that leads to the production of a software project. There are 4 fundamental activities common to all software processes. List and explain these activities and then show how the Waterfall model accounts for these common activities by clearly showing where these 4 activities are accounted for in the various stages of the waterfall model. Give a short explanation as to how the Waterfall stage accounts for a given common activity/activities. You can use diagrams/pictures to show the mapping of fundamental activities to Waterfall stages but do not forget to give a short explanation.

Problem 2 (10 points – 5 points for each term with discussion): You are writing requirements for a large and complex software system. As you are working you realize that trying to achieve the requirements of consistency and completeness for the functional requirements is very difficult. Define the terms, completeness and consistency, and then fully explain why it is difficult to achieve functional requirements that are complete and consistent.

Problem 3 (12 points – 3 points each discussion point): The Waterfall Model is still used today but typically an incremental approach is used when developing software products. What do you think are the main issues with the Waterfall Method? In other words, why did incremental approaches become popular? Come up with two reasons for why you would use the Waterfall Model and also two reasons why you would not (i.e. why is it not as popular today). Be specific and provide a brief supporting discussion for your reasons.

Problem 4 (15 points): The Wall Street Journal on August 25, 2017 published an articled entitled, “Volkswagen Engineer Gets Prison in Diesel Cheating Case.” The article stated:

“DETROIT — A [Volkswagen](http://www.nytimes.com/topic/company/volkswagen-ag?inline=nyt-org) engineer was sentenced on Friday to 40 months in prison for his role in the German automaker’s decade-long scheme to cheat on federal emissions tests for diesel-powered cars sold in the United States.

The engineer, James Liang, is the first company employee sent to prison in the vast scandal that has tainted Volkswagen’s reputation and cost it more than $20 billion in fines and settlements with consumers.

Mr. Liang, who helped develop the software that concealed high levels of pollutants generated by Volkswagen’s diesel engines, reached a plea deal with prosecutors last year after agreeing to assist in the government’s investigation of the company.

But even after that pledge, Mr. Liang received a harsher sentence than the government recommended for pleading guilty to conspiracy to defraud the United States and violating the [Clean Air Act](http://topics.nytimes.com/top/reference/timestopics/subjects/c/clean_air_act/index.html?inline=nyt-classifier).

Federal prosecutors recommended a three-year sentence and a $20,000 fine, but Judge Sean F. Cox of the United States District Court for the Eastern District of Michigan gave Mr. Liang a longer sentence, as well as two years of supervised release and a $200,000 fine.”

This was in follow up to the Volkswagen scandal where software was used to evade diesel emission standards. You are given the original 1977 ACM and IEEE ethics principle for “Public” (found on the next page). Discuss how this engineer did not follow the “Public” principle and subprinciples. Discuss only those subprinciples that apply. Use the subprinciple number (e.g. 1.01) to identify the ones you believe are pertinent. You do not need to rewrite the subprinciple description. Just use the number to identify the subprinciple you are discussing.

**ACM Ethics Principle 1: Public**

Software engineers shall act consistently with the public interest. In particular, software engineers shall, as appropriate:

* 1. Accept full responsibility for their own work.

1.02. Moderate the interests of the software engineer, the employer, the client, and the users with the public good.

1.03. Approve software only if they have a well-founded belief that it is safe, meets specifications, passes appropriate tests, and does not diminish quality of life, diminish privacy, or harm the environment. The ultimate effect of the work should be to the public good.

1.04. Disclose to appropriate persons or authorities any actual or potential danger to the user, the public, or the environment, that they reasonably believe to be associated with software or related documents.

1.05. Cooperate in efforts to address matters of grave public concern caused by software, its installation, maintenance, support, or documentation.

1.06. Be fair and avoid deception in all statements, particularly public ones, concerning software or related documents, methods, and tools.

1.07. Consider issues of physical disabilities, allocation of resources, economic disadvantage, and other factors that can diminish access to the benefits of software.

1.08. Be encouraged to volunteer professional skills to good causes and to contribute to public education concerning the discipline.