Assignment 1 - Solution

Handout: **Friday, September 16th, 2022**
Due: **23:59, Monday, September 26th, 2022**

1. Economic Aspects of Software Engineering (8 marks)

In "Lecture 01: Introduction to Software Engineering" (slide page 11), we gave three possible economic reasons why we may choose not to switch from CM_{old} to CM_{new}, despite CM_{new}'s higher efficiency. Please give at least two reasons from other aspects (not limited to the five aspects listed on slide page 9) that may lead to the same decision. (In no more than 100 words)

a) Regulations and/or rules
b) Compatibility with the other techniques and/or processes
c) (other reasons are also acceptable as long as they make sense)

2. ACM/IEEE SE Code of Ethics and Professional Practice (10 marks)

Read the full version of the Code at
https://ethics.acm.org/code-of-ethics/software-engineering-code/,
pick two clauses, one from Principle 3 PRODUCT and the other from Principle 8 SELF, and then for each clause 1) describe a situation where software engineers may violate the clause and 2) discuss what could be done to avoid the situation and in consequence also the violation. (In no more than 200 words)

3. Software Processes (9 marks)

Please 1) briefly describe one software project you worked with before, 2) decide whether a plan-driven approach based on the waterfall model or an agile method like eXtreme Programming would be more appropriate for the project, and 3) justify your decision. (In no more than 100 words)

A plan-driven approach based on the waterfall model is more suitable for the development of the following systems:

- *Embedded systems where the software has to interface with hardware systems;*
- *Critical systems where there is a need for extensive safety and security analysis of the software specification and design;*
- *Large software systems that are part of broader engineering systems developed by several partner companies;*
- *Software systems with clear and stable requirements.*

An agile method like XP is more suitable for the development of other systems with changing requirements.

A justification is acceptable if it is in line with the above guidelines.

4. Verification and Validation (8 marks)

Please 1) compare the concept of verification with that of validation and then 2) name one activity of each type in our course project. (In no more than 100 words)

Verification is intended to check that a system meets its specification, while validation is intended to check that the system meets the requirements of the user. In our project, unit

testing is a verification activity, while testing directly performed by users at the system level is a validation activity.

5. eXtreme Programming (15 marks)

Schneider et al. [1] discussed several issues they noticed when teaching eXtreme Programming (XP) at universities. Pick two issues from the paper that intrigue you, and then 1) briefly explain what the issues were about, 2) indicate where in the paper the issues were mentioned, and 3) describe what lesson(s) you learn from the discussion on the issues and how the lesson(s) could be useful if you are to apply XP to a course project in the future. (In no more than 300 words)

[1] Jean-Guy Schneider and Lorraine Johnston. 2003. EXtreme Programming at universities: an educational perspective. In Proceedings of the 25th International Conference on Software Engineering (ICSE '03). IEEE Computer Society, USA, 594–599.

How to hand in:

Submit your typed, instead of handwritten, answers in a single PDF file on Blackboard.