



SOFT2412: Agile Software Development Practices

Sample Exam

University of Sydney

This document is a sample exam for SOFT2412: Agile Software Development Practices. It is intended for practice purposes only and does not represent the questions that will be found in the final exam.

The mark distribution and total number of marks in this sample exam do not reflect those of the final exam.

Date: November 13, 2023

Question 1:**(16 marks)**

The following questions are on Git and version control systems.

- a) To what extent would you consider Git to be a distributed version control system? Justify your answer by referring to specific features and commands available for developers to use from the command-line. (5 marks)
- b) Discuss the role of version control systems in Agile methodologies. How do version control practices support Agile principles such as adaptability, continuous improvement, and frequent iterations? Provide specific examples to illustrate your points. (5 marks)
- c) What are the differences between a distributed and centralised control system? Discuss 3 advantages and 3 disadvantages of each. You may wish to discuss how these systems facilitate collaboration, conflict resolution and version tracking in your response. (6 marks)

Question 2:**(20 marks)**

You are part of an Agile team working on *OpenHealth*, a new open-source project for a web-based patient records platform hosted on GitHub. The project is gaining contributors, but faces technical challenges related to Git usage, proprietary code inclusion and licensing.

During the implementation of a new data encryption feature, one of your team members, Rick, inadvertently pushes code containing proprietary elements from a previous employer. Meanwhile, the team is also considering the most appropriate open-source license for *OpenHealth*.

- a) Detail the technical steps using Git commands to revert changes that include proprietary code. Discuss the use of commands like 'git revert' and 'git reset', and their implications in a collaborative project. (5 marks)
- b) Analyze two different open-source licenses, focusing on their technical aspects and compatibility with the project's goals. How does the choice of license impact future contributions and project forks? (5 marks)
- c) Propose a Git workflow strategy to prevent the inclusion of proprietary code in future contributions. Discuss how this strategy integrates with Agile practices and CI/CD pipelines. (5 marks)
- d) Explain how Git encourages collaboration and quality control through branch management and pull requests. (5 marks)
- e) Discuss the role of protected branches and automated build checks using software such as Jenkins in maintaining code quality and consistency. (5 marks)

Question 3:**(20 marks)**

You are applying for a junior backend developer position at a major international IT company. Before you go for an interview, you decide to do some research on the company and discover that their server-side systems are written in Java and they use Agile methodologies.

- a) The company uses Gradle for the majority of its projects. Describe what Gradle is and the purpose/benefit of using it in backend components. (5 marks)
- b) It is well-known that software development tools, Gradle included, can introduce compatibility-breaking changes in major version updates. In a teamwork environment, how can developers ensure that they can achieve the same build process regardless of the Gradle version on their local machine? (4 marks)
- c) The company has also set up its own Jenkins server cluster. Briefly explain what Jenkins is. (3 marks)
- d) Summarise why Jenkins is widely used in software development projects, especially Agile projects. You may wish to discuss aspects such as automation, compatibility and CI/CD practices. (4 marks)
- e) Many project teams use Jenkins webhooks in their code repository. Briefly explain the purpose of these webhooks and discuss how they increase development efficiency. (4 marks)

Question 4:**(12 marks)**

You have recently joined a tech firm that specialises in e-commerce and retail IT solutions as a junior developer. Your team lead, Sarah, tells you that the team is starting to adapt to Continuous Integration (CI) practices.

- a) What does adapting CI mean to your daily workflow as a developer? You may provide an example in your answer. (4 marks)
- b) What are the main benefits of adapting CI in software development projects? (3 marks)
- c) Given the fierce competition in the market, the company is expecting your team to push out new features quickly and frequently. Discuss how this can be done with CI practices. (2 marks)
- d) The team is still discussing whether they will adapt to Continuous Delivery or Continuous Deployment practices for their next project. Discuss the differences between these two, using examples if necessary. (3 marks)

Question 5:**(12 marks)**

The following questions are about Scrum methodologies.

- a) Discuss the importance of the Daily Scrum meeting (Standup) in Scrum. What are the primary questions team members need to address during this event? (3 marks)
- b) Define and discuss the differences between a standup and retrospective in Scrum. (5 marks)
- c) Imagine you have the role of a developer, and you believe that the sprint goal is unrealistic given the time available. How would you address this concern within the Scrum framework, and what actions would you take? (4 marks)

Question 6:**(10 marks)**

You are the Product Owner of a software development team following Scrum practices. Your team is in the middle of a sprint, and you receive a request from a key stakeholder to prioritise a new feature that they believe is critical for the upcoming product release. This feature was not part of the sprint backlog, and it would require significant effort to implement.

- a) As the Product Owner, what steps should you take to handle this request? How can you incorporate this new feature into the current sprint without disrupting the team's progress? Explain your approach in detail. (4 marks)
- b) Considering that you decide to add the new feature to the current sprint, which Scrum artifact(s) will be directly impacted by this decision, and how might they be affected during the sprint? Provide a clear explanation. (5 marks)
- c) At the end of the sprint, the team is unable to complete all the user stories, including the new feature that was added. How should you, as the Product Owner, address this situation while adhering to Scrum guidelines? Discuss the actions you should take and how they relate to Scrum artifacts and events. (4 marks)