UMass Boston CS 410
Homework 2
Posted Monday, March 24, 2025
Due Thursday, April 3, 2025 at 11:59 pm

0 General Instructions

Homework must be typed and converted to Portable Document Format (PDF), see `https://en.wikipedia.org/wiki/PDF`. If you have a problem, request an extension before the work is due and explain how much you have done as well as your reason. We use the Linux servers of the Computer Science Department to collect homework. Homework submitted by email will be sent back.

To submit your homework, prepare one PDF file called `hw2.pdf` — the filename must be exactly `hw1.pdf`, otherwise it will not be collected. Upload the file to the `cs410` folder linked to your home directory on the CS Linux server. If you have trouble with uploading, email `operator@cs.umb.edu` for immediate help and copy the instructor at `jane.deblois@umb.edu`. The questions in this homework are based on the reading in Chapters 3 and 5-8 in Essential Scrum by Kenneth S. Rubin and the agile principles at `https://www.agilemanifesto.org`.

1 Looking at Chapter 3 - Agile Principles

For this question, please read pages 29-60 in Essential Scrum. There are 22 agile principles covered. They are divided into 6 categories, as shown in Figure 3-2, Categorization of Principles, page 31.

Please review the 12 principles in the Agile Manifesto. Note that this list is stated as positive goals: 1-Continuous delivery of valuable software, 2-Welcome changing requirements, 3-Deliver frequently, 4-Developers work with business people daily, 5-Trusting motivated individuals gets the job done, 6-Converse face-to-face, 7-Measure progress in working software, 8-Work at a constant pace, 9-Pay attention to technical excellence and good design, 10-Write code simply, 11-Self-organizing teams create the best architecture, 12-An agile team can adjust its behavior.

In Chapter 3, Rubin contrasts scrum development to plan-oriented development to make the 22 agile principles clear.

1.1 See Figure 3-2, page 31, Category: Variability and Uncertainty: principles 1-4, pages 32-37

"Scrum leverages the variability and uncertainty in product development to create innovative solutions." Rubin, page 32.

1. What are the three kinds of uncertainty?

2. How does building one feature help reduce all three kinds of uncertainty?
3. What is iterative development?
4. What is its downside?
5. What is incremental development?
6. What is its downside?
7. How does the time-boxing of a sprint combine these two types of variability?
8. "In Scrum, we inspect and adapt not only what we are building but also how we are building it (see Figure 3.5)", Rubin page 35. Give an example of how frequent and early feedback helped your team in Sprint 1.
9. Make a sketch of Figure 3.2 showing only Category 1, Variability and Uncertainty and principles 1-4.

1.2 Figure 3.2, page 31, Category: Prediction and Adaptation and pages 37-44

1. List the 5 principles in this category.
2. Explain the one you find most useful.

1.3 Figure 3.2, page 31, Category: Validated Learning and pages 44-47

1. List the 3 principles in this category.
2. Define Validated Learning (use page 421).
3. Explain why "assumptions represent a significant development risk", page 45. Then explain why fast feedback helps (see page 47). Give an example of validated learning that occurred in your teams' sprint 1 development.

1.4 Figure 3.2, page 31, Category: Work in Progress (WIP) and pages 48-54

1. List the 4 principles in this category.
2. Explain in a paragraph (3 sentences or more) what "Focus on idle work, not idle workers" means.

1.5 Figure 3.2, page 31, Category: Progress and pages 54-55

1. List the 3 principles in this category.
2. Explain in a paragraph (3 sentences) what "Meaure progress by validating working assets" means.

1.6 Figure 3.2, page 31, Category: Performance and pages 56-60

1. List the 3 principles in this category.
2. Explain in a paragraph (3 sentences or more) what "Go fast but never hurry" means. Would you use this principle as advice to a new team member? Why or why not?
3. How do you "build in quality" in your own code? When do you find it most efficient to reflect on this goal? Be sure your name is in each module of code you write. It is my opinion that putting your name on a product is the best way to assure your own care for its quality. Software can live forever, right?

2 Looking at Chapter 5: Requirements and User Stories

For this question, please read pages 79-98 in Essential Scrum.

1. What are the three parts of the user story format?
2. List and define the seven INVEST criteria that help create good user stories.

3. Give an example of a Nonfunctional Requirement written two ways as shown in Figure 5.11, page 93.
4. Give an example of Knowledge Acquisition story that your team used (or could have used) in Sprint 1.
5. In your opinion, what is the main advantage of writing user stories to express requirements?

3 Looking at Chapter 6: Product Backlog

For this question, please read pages 99-118 in Essential Scrum.

1. This chapter covers three aspects of the prioritized product backlog of a Scrum project: why it is at the heart of the Scrum framework, how to groom it and whether to have several. Please look at Figures 6-1, 6-2, 6-3, 6-4 and 6-5. List the titles of these five figures.

2. Look at Table 6.1 Example Product Backlog Items, page 101. Note that there are five types, not four as shown in Figure 6.2, page 100. The additional type is a Change order. Please make a five type example for your work in Sprint 1. If you only worked on a Feature, then list possibilities for the other four types.

3. We created initial product backlogs as lists of what to build. We let the team members choose what to build first. We did not list amount of time required or priorities, but you were encouraged to choose a small buildable amount of something that interested you. In a few sentences, describe what you built, and mention what problems you encountered.

4. Grooming the product backlog can happen at various points in the sprint. Which do you prefer and why? One sentence is fine.

5. For your team project, is there any reason to have more than one product backlog? Give the reason either way.

4 Looking at Chapter 7: Estimation and Velocity

For this question, please read pages 119-120 Overview, page 128 Story points, pages 129-133 Planning Poker including rules 1-7, pages 133-134 What is velocity?, pages 137-138 Misusing velocity.

1. In a single class session, with 10-15 startup time, you might be able to workan hour. How many story points would you like to use for that hour? Are you able to do several different tasks if they are well-defined? Why or why not?

2. In this class, we use your own resume enhancement as the way of measuring progress. Please write several sentences to enhance your resume based on Sprint 1.Which types of skills did you develop, broad or deep? What will you focus on next sprint?

5 Looking at Chapter 8: Technical Debt

For this question, please read pages 139-144, Overview and Consequences, and pages 156-157, Servicing the Technical Debt.

1. Using a paragraph, describe what technical debt is.

2. Give an example from your work in sprint 1 of a time at which you put in some extra effort to avoid adding to technical debt.