

Week 13 Tutorial

QUESTION 1

Assess the differences between the agile and lean process models and describe one of these differences.
(2 marks)

QUESTION 2

In the lectures, data from the application of different process models was used to show the percentage of projects using each process model that were successful, challenged or failed. Projects using the agile and lean process models had similar percentages of being successful, challenged or failed. Provide a justified explanation as to why there are these similarities between these two process models.
(4 marks)

QUESTION 3

Formal software inspections have been shown to be very effective at discovering defects. Assess why formal inspections are not a common feature of agile and lean software engineering processes and provide an explanation of one reason for this. What do some agile and lean processes do to achieve some of the benefits of formal inspections?
(4 marks)

QUESTION 4

Provide a justified explanation as to why it would not be appropriate to use both Function Point Analysis and COCOMO 2 to estimate the size of a project.
(4 marks)

QUESTION 5

Consider a software development project to implement a web-based dashboard that will monitor the current state of different investment funds offered by a large investment firm (e.g. a company like AMP). The dashboard will allow a user to drill down into a fund and see its performance across its different investment categories, and then to drill down further into the actual investments in each category.

The dashboard is to be used by senior executives in the company to monitor how well each investment fund is performing. They will use this to help decide investment strategy that is to be implemented by the investment teams in the company.

When answering the questions below, document any assumptions that you make about the development team, organisation or stakeholders.

- a) Select a software engineering process that would be suitable for this project. Provide an explanation as to why your selected process would be suitable. Your explanation should provide at least two reasons for your choice. Explain why the process model (i.e. plan driven, incremental, agile, lean, formal), to which your selected process belongs, would be a better choice than each of the other four process models.
(6 marks)
- b) Identify a requirements modelling technique that would be appropriate for this project. Provide a justification as to why your chosen technique would be more appropriate than other techniques.
(4 marks)
- c) Describe a requirements elicitation technique that would be appropriate for this project. Provide a justification as to why you have selected this technique.
(4 marks)
- d) Describe a significant risk that would be a potential issue for the project. Describe how this risk could be monitored, managed and mitigated.
(4 marks)

QUESTION 6

In your projects you created user story and use case models for systems.

- a) What is one difference between the information captured by use cases and user stories? (2 marks)
- b) What is one limitation of the use case approach for capturing functional requirements? (2 marks)

QUESTION 7

- a) Explain how dynamic testing and static verification (e.g. formal inspections) complement each other during the software development process. (4 marks)
- b) Why is it difficult to ensure that software does not do what is not expected? How is this different to attempting to ensure that software does what is expected? (4 marks)

QUESTION 8

Provide a partial requirements model for a web-based car rental application.

Customers can search for available cars at a rental location. They can select a car, to see details of the car and the total cost of renting the car. They can select a car and book it by supplying their credit card details. These details will then be validated, and the application will email the confirmation of the car rental arrangement to the customer. When a customer returns a car, it is checked for physical damage. If there is any damage the insurance deduction is then charged to the customer's credit card.

The system needs to keep track of each car's bookings, including start and finish location. This is needed to determine which cars will be available at a location at a particular date.

- a) Draw a use case diagram for this system. The diagram should identify all actors and use cases that would capture the functional requirements of the car rental application. Make use of include and extends relationships where appropriate. (5 marks)
- b) Pick one of the important use cases discovered in part (a) and write a description of its typical scenario, using the table format of actor and system interactions used in the requirements specification template. Identify and list all the alternative scenarios but you do not need to describe them. (5 marks)
- c) Pick an important use case, that is different to the one from part (b), and draw an activity diagram for it. The activity diagram should include all the alternative scenarios. (5 marks)
- d) Write two user stories for features of the system that have not been described in parts (b) and (c). These will be assessed based on their relevance to the car rental application description above and their quality in terms of INVEST. (4 marks)
- e) Describe two non-functional requirements (NFR) for the car rental application. Each NFR must be from a different category. Provide an explanation as to why the NFR is an important consideration for the project. (4 marks)