SWE 3633 – Software Architecture and Design - Summer 2021 Section W01

Mid-term exam

Instructions

Answer the following three questions (4 points each) and 18 true-false questions (1 point each) for a total of 30 points.

Late submissions are *not* accepted. If you submit after 5pm you will receive a 0.

You may consult your book, notes, D2L discussions, and any other reference material (including online references). You may *not* discuss the examination with others, whether they are members of the class or not.

Upload this exam as a PDF to the Midterm assignment box in D2L by 5pm Jun 24 2021.

Please ensure that you keep the formatting of this document intact.

Student name: Phillip Blackwell

Assignments with no names in the file will *not* be graded.

Text below is for instructor use only. Do not enter text below this line.

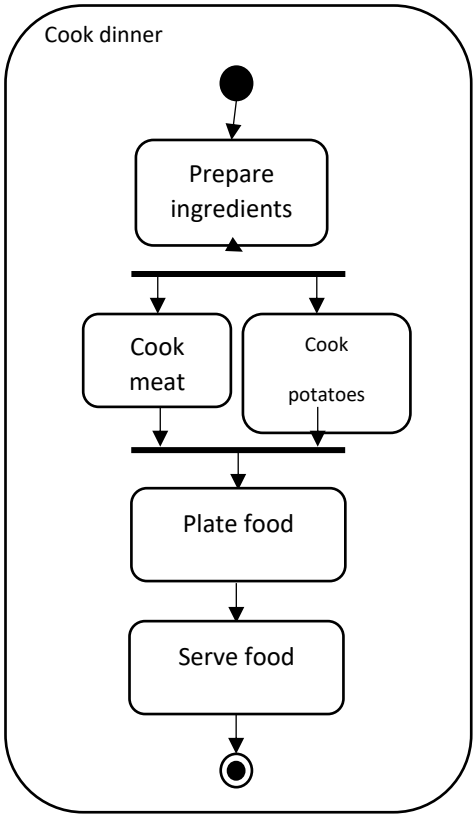
Question	**Score**
Q1	
Q2	
Q3	
T/F	
Total	

Essay Question 1: Explain the steps of a generic design resolution process

Answer: The steps for a generic design resolution are the following: generate alternative requirements; state requirements; evaluate and select alternatives; and finalize a product design. In order to create a good design, one must generate multiple alternative requirements which can be achieved from creative thinking, consulting with users and experts, and studying competitors and similar products. After the alternative requirements have been generated, they need to be checked for verifiability and stated in plain English, formal notation, or semi-formal notation. Plain English is the most widely used but it can be ambiguous. On the other hand, formal notation is more precise, but it can be more difficult for people to understand. Next, the requirements need to be evaluated to see if they satisfy stakeholder's needs and desires which can be done through several techniques such as stakeholder studies and usability studies. After evaluation, designers and stakeholder can select and prioritize candidate requirements for the product. Lastly, the finalization of product design ensures that the product satisfies requirements and that requirements are well documented and valid. In addition, it ensures that the SRS is of high quality. The finalization is typically achieved through reviews such as desk checks, walkthroughs or inspections.

Essay Question 2: Describe the process modelled in this activity diagram.

Answer: This activity diagram illustrates the process of cooking dinner. First, the token leaves the initial node, which is the bold black circle at the top, and travels to along the edge to the prepare ingredients action node. Once that action has been performed, a token travels to the fork node which then produces two tokens: one token travels to the cook meat action node and the other travels to the cook potatoes action node. Each of the previous action nodes produce a token and once they are finished, the two tokens are joined at the join node which produces one token. The token then travels along the edge to the plate food node and once it is performed, a token travels to the serve food node. Lastly, once the serve food action is performed a token travel to the activity final node, the black circle at the bottom, which completes the process.



Essay Question 3: Describe why it is critical to involve stakeholders in the design process.

Answer: It is critical to involve the stakeholders because one of the most common causes of software failure is due to lack of user involvement. Stakeholder involvement in the design process is especially necessary because stakeholders need to explain their needs and desires so that the product designers can generate requirements. In addition, stakeholders need to verify that the requirements generated from the product designers are correct. If product designers do not consult the stakeholders, then they will likely design the wrong product which will be useless to the stakeholders.

True or False questions (Highlight your answer)

1. Use case diagrams are good tools for iteratively generating, evaluating, selecting, and refining alternative designs for the set of interactions supported by a product.
   A. True
   B. False

2. During the architectural design step, we specify the internal details of each component.
   A. True
   B. False

3. A good architectural style supports all quality features.
   A. True
   B. False

4. Activity Diagrams can represent any process and are useful throughout software design.
   A. True
   B. False

5. In an activity diagram, an activity is an atomic task or procedure that cannot be broken into parts.
   A. True
   B. False

6. In an activity diagram the initial node produces a token on each outgoing edge when an activity begins
   A. True
   B. False

7. Architectural design is a high-level software engineering design analysis.
   A. True
   B. False

8. The Software Requirements Specification (SRS) is the main input for the product design process.
   A. True
   B. False

9. Business Requirements are part of the project mission statement.
   A. True
   B. False

10. As a product design principle, simplicity means that a design is acceptable only if it is simple and easy to understand.
    A. True
    B. False

11. The product design finalization ensures that the SRS is of high quality.
    A. True
    B. False

12. A set of requirements is consistent if it includes every relevant requirement.
    A. True
    B. False

13. Every use case diagram must have at least one actor associated with each use case.
    A. True
    B. False

14. UML use case diagrams are dynamic models of all the use cases in a product.
    A. True
    B. False

15. Post-conditions must be true when the use case ends, whether it is successful or not.
    A. True
    B. False

16. Use case models provide atomized requirements statements.
    A. True
    B. False

17. Product Design Principles include all of feasibility, usability, economy, and changeability.
    A. True
    B. False

18. A UML diagram must provide a complete view of the entire software system.
    A. True
    B. False