Final Assessment (Online Test)

Started: 10 Apr at 8:30

Quiz instructions

This Final Assessment Test for SWE30003 (Software Architectures and Design) is conducted on the Unit's Canvas site.

Test location (on Canvas) and Time:

Please go to "Assignments", then under "Final Assessment (Online Test)", which will only be available from 8:30am to 11:00am on Wednesday, 10 April 2024.

Test information and instructions:

1. ***This test is individual work*.** Each student can consult their own study materials. But, every student taking this test should not consult any other person during and regarding this test.
2. You ***must answer all questions in your own words***, rather than copying from other sources (including but not limited to tools such as ChatGPT and Google Search).
3. Students contravening the above requirements will be subjected to the usual university disciplinary action.
4. For each question, ***example(s) as required have to be provided*** to obtain any mark for that question. That is, **answers to a question without the required example(s) will score zero (0) mark.** (This is to minimize the impact of (inappropriate) cases where only generic answers are copied/para-phrased from reference sources without the necessary understanding and application.)
5. For each question, a "rich text editor box" (similar to those found in the weekly Q&A submissions) is provided for students to type-in their answer.

Technical Issues affecting Final Assessment (Online Test) Period:

*If you experience any significant technical issues during the completion of your scheduled final assessment task, you are able to apply for Special Consideration. In this case you must provide evidence such as a screen shot or a photo from your phone, clearly showing the date and time, and then apply using the normal process for Special Consideration. There is **no need** for a Registered Practitioner Statement (ie, doctor's certificate) in this scenario.*

*If you become unwell during the completion of your final assessment task the normal Special Consideration processes are available for you, **you would need** to have a Registered Practitioner Statement (ie, doctor's certificate) as part of your application.*

You can apply for Special Consideration using this link

https://www.swinburne.edu.au/student-administration/forms/online-applications/SPC-info.php
(https://www.swinburne.edu.au/student-administration/forms/online-applications/SPC-info.php)
(https://www.swinburne.edu.au/student-administration/forms/online-applications/SPC-info.php)

Question 1 8 pts

According to the “Goal-Design Scale”, requirements for a software system can be described at four different levels (i.e., the goal, domain, product and design levels).

(1) Discuss the main differences between ‘Domain-level’ and ‘Product-level’ requirements;

(2) Give *an example requirement* for *each of these four levels* from your assignments concerning the Online Healthy Foods Store System.

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Question 2 4 pts

In the context of a software system,

(1) Explain the difference between the "*Inner Domain"* and the "*Outer Domain"*;

(2) Give *an example entity* in *each of these two domains* from your assignments concerning the Online Healthy Foods Store System.

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Question 3 6 pts

In considering the quality attributes of a software system,

(1) Why cannot quality attributes, in general, be considered in isolation?

(2) Give two different examples (i.e., two software system situations) from the Online Healthy Foods Store System of your assignments, where for each situation, one quality attribute impacts negatively on another quality attribute, and elaborate why, from your perspective, one quality attribute should be preferred over the other in each of the respective examples.

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Question 4 4 pts

In software development, we often use "abstraction".

(1) Explain the concept of "*abstraction"* in software development;

(2) Give two examples of how you used (or would have used) abstractions in analysing and designing the Online Healthy Foods Store System in your assignments.

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Question 5 6 pts

"Throughput" is a quality attribute of a software system.

(1) What is "*throughput"*? How is it measured? Why is it important to make the distinction between "*average throughput"* and "*peak throughput"* in many software systems?

(2) Give examples from the Online Healthy Foods Store System (of your assignments), to illustrate the above three concepts (ie, throughput, average throughput, and peak throughput).

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Question 6 6 pts

(1) Explain the difference between "*inheritance"* and "*composition"* in the context of object-oriented software design;

(2) Use two example situations from the Online Healthy Foods Store System (of your assignments), to explain why they are (or would be) suitable to use inheritance and composition, respectively.

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Question 7 8 pts

(1) Name and briefly describe *two architectural styles* suitable for the Online Healthy Foods Store System in your assignments;

(2) Use *one* of the two styles you identified above, to provide a brief architectural design description for the Online Healthy Foods Store System (of your assignments).

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Question 8 6 pts

A key aspect of software development is "reuse".

(1) What are pattern-based reuse and code reuse?

(2) Use two example scenarios/situations from the Online Healthy Foods Store System (of your assignments), to explain why they would be suitable for pattern-based reuse and code reuse, respectively.

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Question 9 6 pts

(1) What are the advantages and disadvantages of the “layered” architectural style (at least 4 advantages/disadvantages together)?

(2) Is the “layered” architectural style suitable for a Hotel Management Software System? Explain why.

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Question 10 6 pts

(1) Name and describe three *architectural tactics* that can be used to improve the *scalability* of a software system;

(2) Use examples from the Online Healthy Foods Store System of your assignments (when it needs to support an expanded large-scale international business operation), to explain how the above three approaches aid scalability.

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