

Object Oriented Software Engineering

FINAL EXAM

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Question #1 (15 Marks)

You have to make a personalized software for a consultancy firm. Some components of the software are those for which you already have code. Some parts of the software are such that you can find ready-to-be-used code from internet. If you want to embed both types of code into your product, and complete the software by coding the remaining part, what can you expect during this whole process? Will it be easy or hard? What problems you might face and how will you overcome those problems?

Answer: It is important to be aware of the different types of software. A technique or methodology that works well for the development of one type of software could be a disaster when used in the production of another type of software. It is not an easy process because embedded software controls everyday devices and machines most people don't think of as computers. For example: cars, audio equipment and appliances. Quality is much more important with embedded software because often there is no mechanism for updates. Embedded software runs on dedicated hardware often with limited resources. This puts a premium on efficiency over other non functional attributes such as readability and maintainability. Problems of embedded software are

Stability: Stability is of paramount importance. Unexpected behavior from an embedded system is inadmissible and poses serious risks.

Safety: Safety is a special feature of embedded systems due to their primary application associated with lifesaving functionality in critical environments.

Security: Security became a burning issue in the digital world. The related risks grow exponentially, especially so for IoT devices gaining popularity worldwide and becoming more interconnected to each other.

Launch phase: Time to market and time to revenue have always been tough indicators in embedded system development, especially in the IoT segment. That is why the apps and platforms supposed to support zillions of IoT devices expected to appear by 2020 still are in their concept stage.

Design limitations: The challenges in design of embedded systems have always been in the same limiting requirements for decades

Compatibility and integrity: Gartner group estimation shows that, presently, most of the apps in the market are launched by businesses younger than 3 years old. With all their probable expertise in Software development, many of them lack hands-on experience in implementing and updating their applications in IoT environment, especially with regard to security implications.

Question #2 (15 Marks)

You are working on coding of a software in which a lot of calculations are involved. The calculations are quite easy to be done, but you do expect some inconsistency in the calculations because of some inner problem with the software. Would you rather go for Fault Avoidance technique or Fault Detection technique in the Testing Phase? Explain your answer.

Answer: I will go for Fault detection technique because testing is a fault detection technique that tries to create failures or erroneous states in a planned way. Fault detection techniques, such as debugging and testing, are uncontrolled and controlled experiments, respectively, used during the development process to identify erroneous states and find the underlying faults before releasing the system. Fault Detection techniques assist in finding faults in systems, but do not try to recover from the failures

caused by them. In general, fault detection techniques are applied during development, but in some cases they are also used after the release of the system. The blackboxes in an airplane to log the last few minutes of a flight is an example of a fault detection technique.

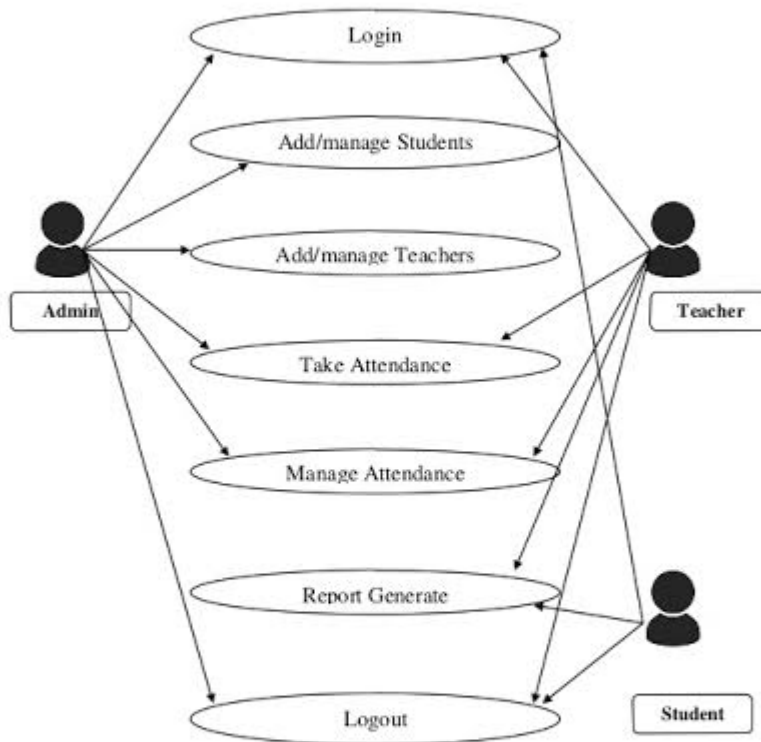
Question #3 (20 Marks)

Consider your University Attendance Marking System in a class. Keeping in mind all the activities, both the start and end of the class, come up with the following:

1. A Use Case Diagram
2. A Textual Use Case Diagram

Answer:

Use Case Diagram:-



Instructions for Assignment Submission

1. Write your names and Ids at the top of each paper of answer sheet.
2. Scan using simple scanner or the CamScanner of any android phone / Take Photo of each paper and save each photo with a number. E.g. photo of page 1 of answer sheet be saved with name 1.jpg, then 2.jpg and so on.

3. Make a PDF file of all the pictures and name it with your Roll Number, Name and Subject Name, e.g. "11512 - Sanaa Jeehan - OOSE".
4. Upload the file as it is or zipped.
5. Don't forget to check that the correct document is properly uploaded.