

**Chair for Applied Software Engineering  
Prof. Bernd Bruegge**

**Quizzes**

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What is a project agreement?

Explain the difference between a work product and deliverable:

What is a baseline?

What is slack time?

Describe the difference between COCOMO and COPMO.

What is COCOMO?

What is a cost driver?

Why is cost estimation so difficult?

What are the three kinds of models used to describe a system in the OMT

Define each of the following terms: Abstraction, Polymorphism, Inheritance.

Mention some of the attributes of a complex system

How do you deal with software complexity?

What is abstraction?

What is information hiding?

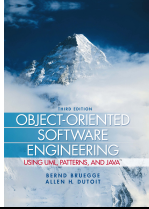
According to Pfleeger, what are the activities in a software development process?

According to Booch, what concepts help us to deal with the complexity in a software system?

How would you classify the degree of difficulty of the FRIEND project? Use the characteristics mentioned below and add at least 2 more mentioned in Pfleeger's book.

Characteristic	Difficulty (low, moderate, high)
Number of functions performed	
Interactive vs batch access	
Amount of data stored	
Structure of data	
Remote vs local	
Tolerance for down time	
Security needs	

What is a project agreement?



Explain the difference between a work product and deliverable.

What is a cost driver?

Why is cost estimation so difficult?

What are the three kinds of models used to describe a system in the OMT methodology?

Define each of the following terms Association, Aggregation, Role, Qualified association.

What is the difference between a model and an abstraction?

Explain the difference between Class and Object

What is an association?

Describe inheritance

When should aggregation be used in an object model?

What is the difference between event and state?

What is the difference between action and activity?

What is the difference between an event trace and an event scenario?

What is a nested state diagram?

What is an automatic (or lambda) transition?

What is a state contour?

What is the difference between internal action and self-transition?

What are shopping list operations?

Name at least 3 of the steps that are needed to construct an object model (If you name at least 5 of the steps you get a bonus point, if you name all 8 steps, you get two bonus points):

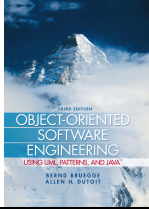
Why is analysis an iterative process?

What is an analysis model?

Select 2 of the following systems and identify the relative importance of the three aspects of modeling. O: object modeling, D: dynamic modeling, F: functional modeling. Justify your answer in a few sentences.

Example: Bridge player. Answer: F,O, D. The game involves a great deal of strategy, thus good algorithms are needed for intelligent playing, close attention to inheritance can result in significant code reuse. The interface is not complicated, so the dynamic model is simple and could be omitted.

1. change-making machine
2. car cruise control
3. electronic typewriter
4. spelling checker
5. telephone answering machine.



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Select a third system and describe it in the same way (Use other page if necessary).

What is a system architecture?

Describe some of the steps that occur during system design:

What does peer-to-peer mean?

What is a layer?

Describe the 8 steps that occur during system design:

Name some common architectural frameworks:

Describe the steps that occur during object design (1 bonus point for all steps):

What is delegation?

What is the difference between policy and implementation?

What is a container class?

When do you use delegation?

What is a class library?

What is strong type checking? Does C++ have it? Smalltalk 80?

What is method caching?

Describe some of the steps that occur during analysis and system design.

What is garbage collection? Does C++ have it? Smalltalk 80?

What is method caching?

Describe some project management activities:

Describe some of the steps to build an object model:

Describe some of the steps that occur during requirements analysis:

Describe some typical errors that can and cannot be caught with unit testing:

What is integration testing?

What is the difference between a test stub and a test driver?

What is sandwich testing?

What is a test harness?

What is the difference between integration & system testing?

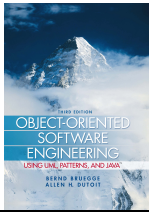
What is an embedded system?

What are the different types of maintenance?

List some typical maintenance problems:

What influences the cost of maintenance?

Define the following terms: Release, Promotion, Baseline, Version, Revision.



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What is a configuration control board (CCB)?

Which entities should be placed under configuration control during software development?

What is the difference between a dynamic library and a controlled library?

Name at least 4 issues you should consider in a software configuration management plan (SCMP)

Name at least 5 different users of a software system.

Name at least 4 of the project roles a developer has to assume during software development.

How many potential communication lines are in a project with 45 team members?

Define each of the following terms Signature, Data Store, Actor, Query:

What is the difference between a base attribute and a derived attribute?

Define the term system architecture:

What does peer-to-peer mean?

Name some common frameworks for system architectures:

How would you characterize @c(Interactive Pittsburgh)' system architecture?

What is the difference between policy and implementation?

What is garbage collection? Does C++ have it? Smalltalk 80?

What is method caching?

What is a problem statement?

What is a SPMP?

Name at least 5 of the project management activities and/or technical processes that are needed to write a SPMP

Name at least 4 of the steps that are needed to construct an object model. If you name at least 5 of the steps you get a bonus point, if you name all 8 steps, you get two bonus points.

Name at least 3 of the steps that are needed to construct a functional model.

Name at least 3 of the steps that are needed to construct a dynamic model

Name at least 4 of the steps that are needed during system design.

Name at least 4 of the steps that are needed during object design

Describe at least 2 typical errors that be caught with unit testing.

Describe at least 2 typical errors that cannot be caught with unit testing:

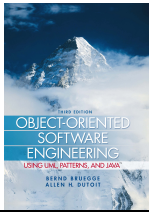
What is integration testing?

What is a test oracle?

What are the pros and cons of program verification?

What is the difference between integration & system testing?

What is an embedded system?



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What are the different types of maintenance?

What influences the cost of maintenance?

Define the following terms: Version, Revision,

What is a configuration control board (CCB)?

Which entities should be placed under configuration control during software development?

What is the difference between alpha and beta testing?

Mention some of the attributes of a complex system

How do you deal with software complexity?

What is information hiding?

Name at least three of the activities required to build a complex software system (bonus point if you can name five).

What is a subsystem?

When can you do a subsystem decomposition at an early stage, for example before the analysis? When do you have to do it late, that is, after robustness analysis?

Give an example of a subsystem that depends on another subsystem

What are functionally coherent subsystems?

What is the spiral model of software development?

What is the advantage of prototyping?

What is the difference between reengineering and reverse engineering?

What are the three reengineering scenarios described in Jacobsen's paper?

Preparing an analysis model is the first step in reengineering. What kind of information do you need to prepare such a model? (List at least 3 sources of information):

Why do you think it is possible to define an object-oriented analysis model for a system that was originally not developed with an object-oriented methodology?

What is the difference between adaptive and perfective maintenance?

List at least 4 factors that impact the cost of maintenance

Define horizontal (requirements) traceability

How is requirements traceability supported by Objectory?

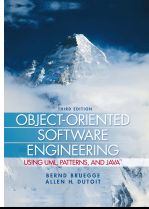
What is a test specification?

Describe a situation where testing of object-oriented systems is different from testing functionally decomposed systems:

What is the difference between stress testing and performance testing?

What is the difference between unit testing and integration testing?

What is the difference between white-box and black-box testing?



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Bonus (2 points): Describe an error that can be caught with white-box but not with black-box testing and another error that can be caught by black-box but not by white-box testing.

Name at least 3 activities during the testing process

Why is the requirements elicitation more challenging than the requirements analysis?

What are the major steps in requirements elicitation. (4 points)

Describe one of the four methods mentioned in the book for eliciting information from the user and negotiating an agreement with the client. (4 points)