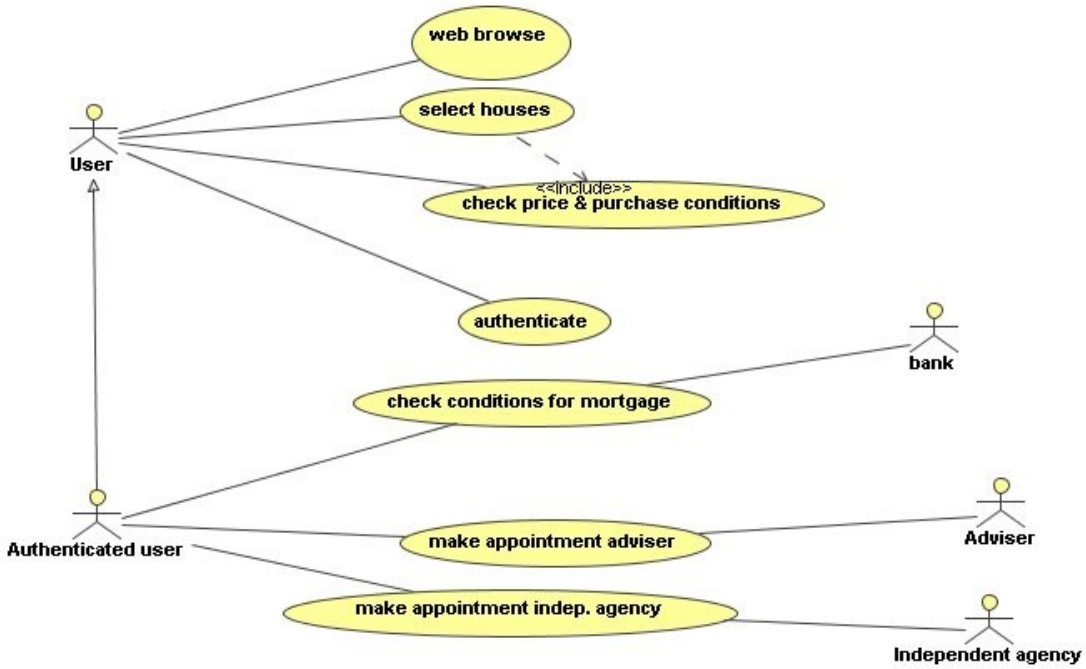
Solution Exam Software Engineering (400071)
29 August June 2007

The correct answers are underlined: [1.b, 2.ac, 3.b, 4.b, 5.abc]

1. Which is the main difference between incremental development and RUP? [1 point] (select one or more answers from the following possible answers):
   - 1.a) Incremental development does not foresee the first RUP phase (Inception).
   - 1.b) Incremental development delivers functionality in small increments, whereas the RUP delivers the complete functionality altogether.
   - 1.c) In RUP iterations occur within each of its four phases, whereas in incremental development each iteration executes all phases once.
2. What is requirements elicitation? [1 point] (select one or more answers from the following possible answers):
   - 2.a) It is the process of making explicit the implicit requirements users and/or clients have on a software system.
   - 2.b) It is the process of describing the requirements users and/or clients have on a software system by means of a textual and/or graphical notation.
   - 2.c) It is the process of making explicit the functional and quality requirements end-users have on the GUI of an interactive system.
3. What is a test case? [1 point] (select one answer from the following possible answers):
   - 3.a) it is a criteria used for measuring the quality of a testing technique.
   - 3.b) it is a set of data used for testing.
   - 3.c) it is a testing technique used for testing.
4. What is the difference in UML between a communication diagram and a sequence diagram? [1 point] (select one answer from the following possible answers):
   - 4.a) Unlike the sequence diagram, the communication diagram shows a usage scenario carried out by a number of class instances (objects).
   - 4.b) Unlike the sequence diagram, the communication diagram uses mandatory sequence numbers to emphasize the ordering of messages exchanged among objects.
   - 4.c) Unlike the sequence diagram, the communication diagram shows the static structure of a software system.
5. With which design criteria is “information hiding” strongly related? Why? [1 point] (select one or more answers from the following possible answers):
   - 5.a) It is strongly related with “abstraction”, because if you hide something, the user may abstract from that fact.
   - 5.b) It is strongly related with “coupling”, because the hidden information decreases the dependency between a module and its environment.
   - 5.c) It is strongly related with “cohesion”, because the *secret* is the reason including the parts in its module.

Questions related to the case study

6. For the case study, draw a UML diagram to specify the functional requirements. Explain why you selected that UML diagram [2.5 points].



I selected the UCD, because the system to be specified has two main complex aspects, one being the set of operations to be made available to a set of external actors. The UCD specifically shows functions and actors, hence precisely showing what is difficult in this system.

[Comment: the second main complex aspect is the data that must be maintained by the system. An alternative UML diagram could have been a Class Diagram specifying the data model.]

7. Use a UML component diagram to describe a possible design solution for the complete case study. Define in a clear way each operation offered by the interface(s) of all components. If needed, use additional text [2.5 points].

One design solution is illustrated in the following UML component diagram, showing the design of the complete system. All functionalities specified in the UCD given above, are translated into operations of the component interfaces here below. Hence, the UCD already clearly describes the corresponding operations in the component interfaces. Dependencies in the diagram below (dashed arrows) show required interfaces.