Please Note:

This practice exam is longer than the real exam will be. The goal for this "exam" is to provide you with practice problems and to give you a sense of how the test will be structured.

The first question is designed to measure recognition, the second to measure recall, and the third to sample vocabulary comprehension. The other questions involve problem solving skills.

Note, that the real test will generally avoid questions where subsequent questions depend on you getting an earlier question correct. In a real exam, questions 4 through 10 would be framed so they are independent of each other.

1. (20 pts, 2 pts each) For each term on the left, select the best description on the right. Put the letter associated with the description in the blank adjacent to the term.

___ accidental complexity

___UML association

___duplicate code

___functional design paradigm

___CRC Cards

___UML

___scenario

___product owner

___EARS

___Noun-phrase analysis

a. A methodology-independent graphical modelling language.
b. A design paradigm that focuses on sequential blocks of instructions.
c. A technique for identifying candidate domain concepts.
d. A specific example of system usage.
e. The long term consequence of fixing bugs.
f. Related to mathematical composition.
g. An analytic technique that simplifies complex systems by focusing on important aspects while obscuring or ignoring less important details.
h. A specific syntax for writing clear requirements.
i. Problems created or aggravated by technological choices and, thus, which are possible to 'fix' with improved technology.
j. A retail customer.
k. Introduced in a paper by Kent Beck.
l. A scrum role – the person determines what features will be included in the software under development.
m. A line between two boxes.
n. A code smell.
o. A form of inheritance.

2. (20 pts, 4 pts each) Complete these statements by filling in each of the blanks with the appropriate word or phrase.
   a. Dijkstra introduced _____ to the vocabulary of software engineers in his essay "On the Importance of Scientific Thought."
   b. A _____ contains conceptual classes, associations between conceptual classes, and attributes of a conceptual class.
   c. The goal of design is to create systems that can be easily _____.
   d. The _____ in a use case initiates an interaction with the system.
   e. _____ is one of the five responsibility assignment patterns included in GRASP.

3. (20 pts, 4 pts each) Compare and contrast each of the following terms. You will *not* receive credit for attempts to define or describe the meaning of the terms. You *must* identify (succinctly) some meaningful commonality they share (both start with "s" doesn't count) and some difference(s) that distinguish(es) them.

   a. Object Oriented Analysis vs Object Oriented Design

   b. Procedural Design Paradigm vs. Modular Design Paradigm

   c. Refactoring code vs. rewriting code

   d. Use Case vs. Scenario

   e. Object vs. Class

Refer to the following set of scenarios to answer problems 4 through 10. These scenarios are related to use cases in a partially complete design for a ride sharing app.

Scenario 1: Happy path scenario for use-case "Registered Driver schedules trip"

A driver, who has previously registered with the ride sharing service, authenticates with the system, and supplies a trip plan. The trip plan describes the driver's vehicle, the intended start location and destination, the intended departure time, the driver's required arrival time, the amount of time the driver is willing to add to the trip to accommodate a rider, and which (of the pre-defined cost sharing arrangements) the driver prefers. The trip is now eligible to be matched with potential riders.

Scenario 2: Happy path scenario for "Rider looks for ride."

The rider, who has previously registered with the ride sharing service, authenticates with the system, and supplies a trip plan. The trip plan describes the intended start location and destination, the intended departure time, required arrival time, the rider's degree of flexibility in departure time (in terms of time before and time after). The system displays general information about drivers with potentially matching travel plans, including type of vehicle, departure and time en route, cost sharing preferences, and historic rider ratings for the driver.

Scenario 3: Happy path scenario for "Driver cancels trip."

A driver who has previously scheduled a trip, authenticates with the system and requests to cancel a scheduled trip. The system displays a list of the driver's currently scheduled trips. The driver selects one of more trips from the list, and confirms that the selected trips are to be cancelled. The system marks the associated trips cancelled and notifies any riders who had expressed interest in the trip of the cancellation.

4. (10 pts) Create a use case diagram based on the three brief format scenarios above. You are not expected to complete the design – just create the use case drawing as if these scenarios were the only functions to be included in the app.

5. (7 pts) From the ride sharing scenarios, use noun phrase analysis to identify at least seven potential domain objects/concepts.

6. (20 pts) Create a domain model for the partial ride sharing design include at least five domain objects and at least three annotated associations among them.

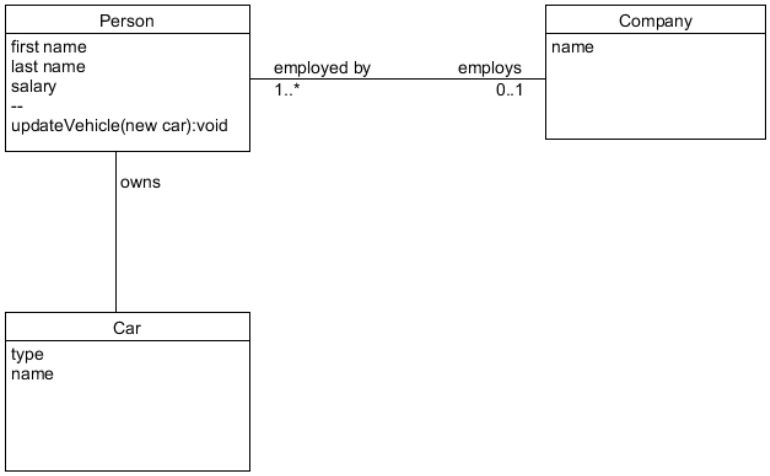
7. (15 pts) Find three requirements in the scenarios (at least one that is event triggered, and at least one that is state-triggered) and write them in EARS syntax.

8. (20 pts) Find five responsibilities in the scenarios. Assign a name to each responsibility and write a brief description of each.

9. (6 pts) Pick three of the named responsibilities in 5 and tell which object in 3 you would assign that responsibility to. Justify each choice in terms of one or more of the GRASP responsibility patterns.

10. (5 pts) Draw and fill in a CRC card for one of the objects to which you assigned a responsibility in problem 9.

11. (4 pts) What is wrong with this Domain Model?



12. (4 pts) What is wrong with this Use Case Drawing?