

CSC 131: Midterm Exam, Fall Semester 2015

Student Name: _____KEY_____

Directions - please read the questions carefully. Pace yourself by keeping track of how many problems you have left to go and how much time remains. You do not have to answer the problems in any particular order, so move to another problem if you find you are stuck or spending too much time on a single problem. Please write precise and clean answers. But, please do not leave it blank there as I will give partial credits.

1. Multiple choices questions: (20 points)

1) Select the option that suits the Manifesto for Agile Software Development

- a) Individuals and interactions
- b) Working software
- c) Customer collaboration
- d) Responding to change
- e) **All of the mentioned**

2) Consider the following requirement specification fragment for a ticket-issuing system “Between 0600 and 2300 in any one day, the recovery time after a system failure should not exceed 2 minutes”. This is a functional requirement.

- a) True
- b) **False**

3) Consider the following requirement specification fragment for a ticket-issuing system “Once a destination has been selected, users are requested to input their credit card. Its validity is checked and the user is then requested to input a personal identifier. When the credit transaction has been validated, the ticket is issued.” This is a functional requirement.

- a) **True**
- b) False

4) Analysis models depict software in which three representations?

- a) Architecture, interface, component
- b) Cost, risk, schedule
- c) **Information, function, behavior**
- d) None of the above

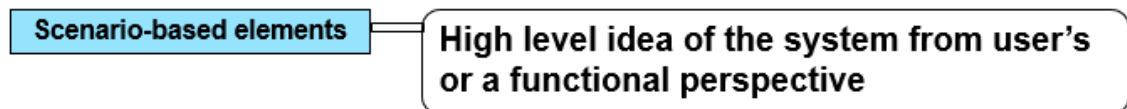
5) The incremental model of software development is:

- a) A reasonable approach when requirements are well defined.
- b) A good approach when a working core product is required quickly.**
- c) The best approach to use for projects with large development teams.
- d) A revolutionary model that is not used for commercial products.

6) Which model in system modelling depicts the high level idea of the system from user's or a functional perspective?

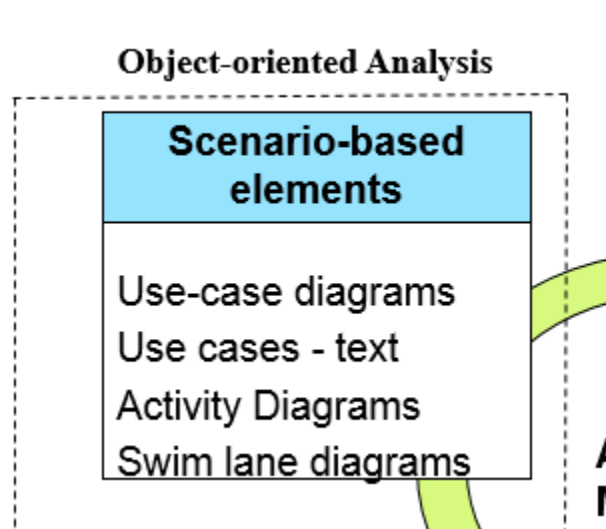
- a) Context Model
- b) Behavioral Model
- c) Scenario-based model**
- d) Object Model

Elements of the Analysis Model



7) UML activity diagrams are useful in representing which analysis model elements?

- a) Behavioral elements
- b) Class-based elements
- c) Flow-based elements
- d) Scenario-based elements**



8) Which of the following is NOT an objective for building an analysis model?

- a) Define set of software requirements that can be validated
- b) Describe customer requirements
- c) **Develop an abbreviated solution for the problem**
- d) Establish basis for software design

9) Which of the following is not necessary to apply agility to a software process?

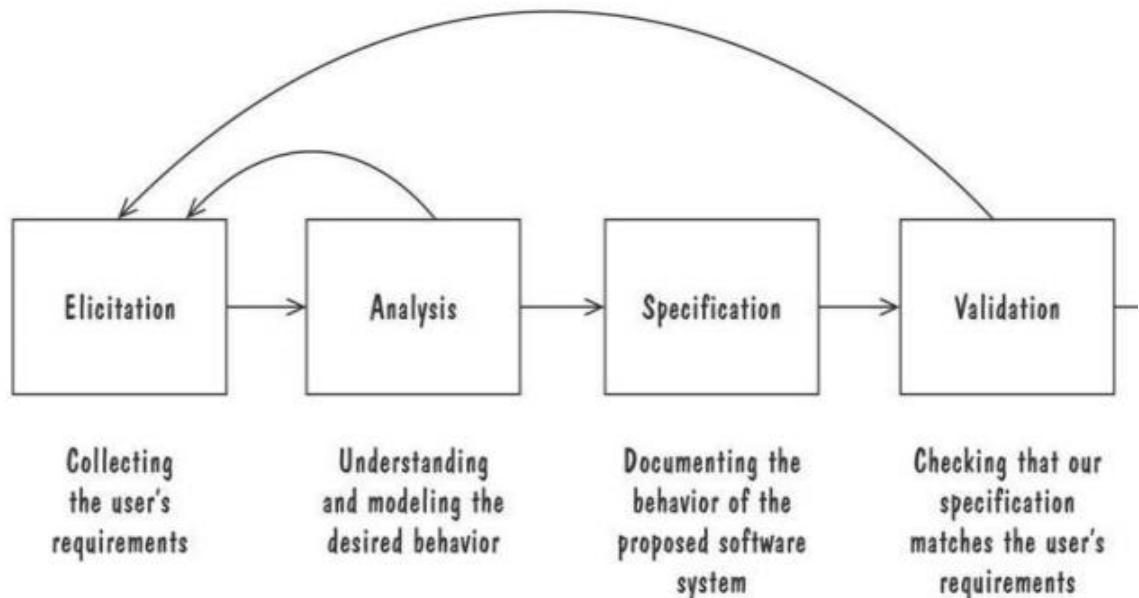
- a) **Eliminate the use of project planning and testing**
- b) Only essential work products are produced
- c) Process allows team to streamline tasks
- d) Uses incremental product delivery strategy

10) The agile and waterfall development methodologies use the same software lifecycle, just at different granularities/tempos.

- a) **True**
- b) False

2. Requirements Engineering (20 points):

The Requirement Engineering (RE) is the most important phase of the Software Development Life Cycle (SDLC). Name and describe the main processes (4) in requirements engineering. For each process, provide one example of what a developer(s) and a user(s) would do.



Example - Elicitation: Developer interviews User to obtain requirements (simplest form)

Example – Analysis: Understanding and Modeling the desired behavior: Developer uses the data collected in elicitation phase to develop use case model. Developer reviews with customer for coverage/completeness.

Example - Specification: Developer records the requirements in short and concise natural language sentences. Use keyword “shall” to signify formality. Developer reviews the requirements with users. Developer attempts to classify non-functional and functional requirements at this phase.

Example – Validate: Both developer and user inspect requirements (derive from specification). Both check requirements for completeness, feasibility, ambiguity (issue), verifiable. Make correction, update where appropriate.

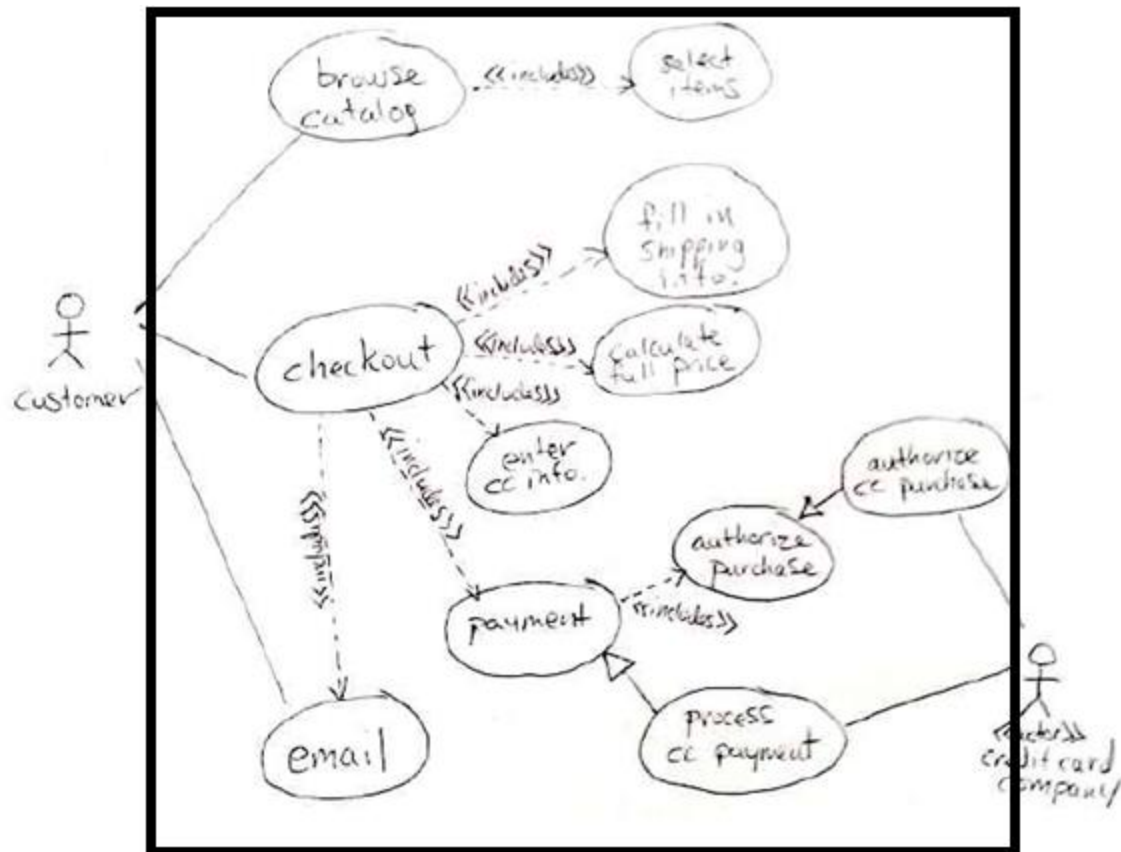
3. Use case diagram (20 points):

Draw a UML Use Case diagram for the given description below. Please follow the 4 steps as per mentioned in our practice:

1. List main system functions (use cases) – think of business events demanding system's response – users' goals/needs to be accomplished via the system.
2. Define system boundary
3. Draw actors and connect them with use cases
4. Specify include and extend relationships between use cases (when applicable)

Use Case – Buy a Product

1. Customer browses catalog & selects items to buy
2. Customer goes to check out
3. Customer fills in shipping information (address, next-day or 3-day delivery)
4. System presents full pricing information
5. Customer fills in credit card information
6. System authorizes purchase
7. System confirms sale immediately
8. System sends confirming email to customer



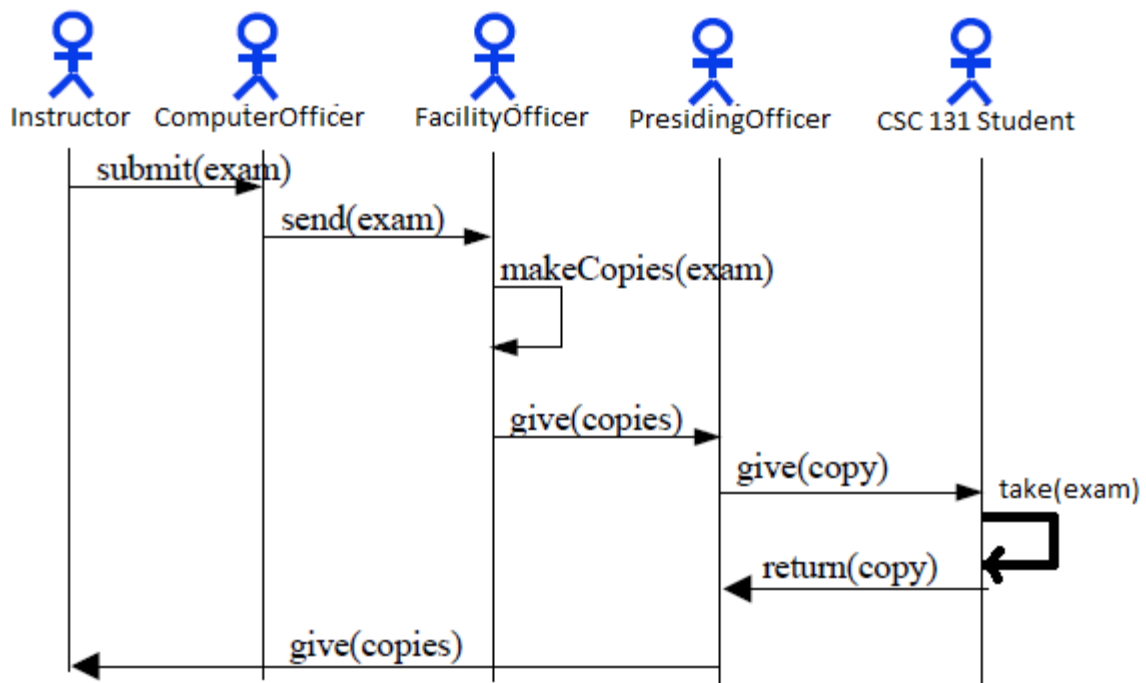
Buy a product

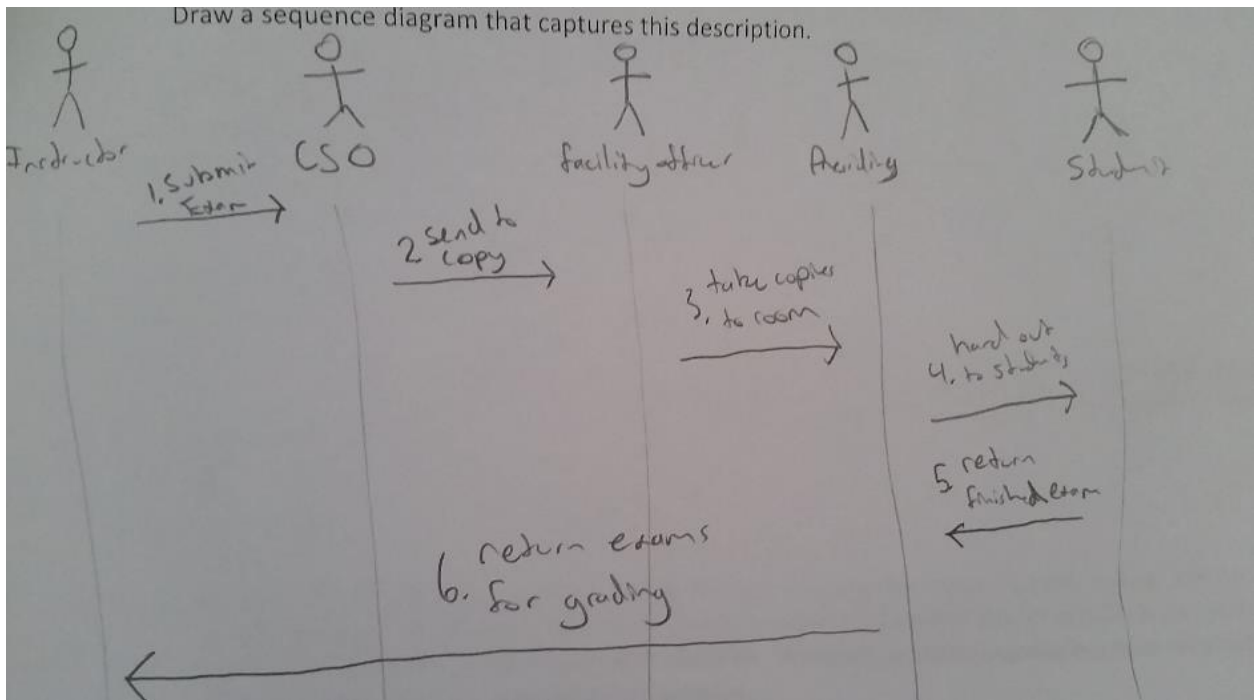
Marks for: (1) completeness: all use cases listed (2) show all the «includes» for checkout (3) acknowledge the external «actor» representing the credit card company (or equivalent), and (4) optionally show some «extends» relationships, and generally (5) it makes some sense.

4. Sequence diagram (20 points):

A midterm exam is prepared by the instructor of the CSC 131 course and submitted to the Computer Science office. The office sends all exams to the Facility officer where copies are made. On the day of the exam, the Facility officer gives the exams to the Presiding person who takes them to the room where the exam is given. The students write the exam on an exam copy, and return to the Presiding officer at the end of the exam. The written exam copies are given to the instructor for grading finally.

Draw a sequence diagram that captures this description.











A student's solution

From Lecture's week 5:

Sequence Diagram Syntax

AN ACTOR	
AN OBJECT	
A LIFELINE	
A FOCUS OF CONTROL	
A MESSAGE	
OBJECT DESTRUCTION	

Example Sequence Diagram for Withdraw Use Case

