


Solution Midterm 2:

		<h1>King Saud University</h1> <p>College of Computer and Information Sciences Computer Science Department</p>		
		Course Code:	CSC 342	
		Course Title:	Software Engineering	
		Semester:	Spring 2016	
		Exercises Cover Sheet:	Solution Midterm 2	1hour 30 mn
Student Name:			
Student ID:			
Department Name:			
Tick the Relevant	Computer Science B.Sc. Program ABET Student Outcomes	NCAAA Outcomes	Question No. Relevant Is Hyperlinked	Covering %
	a) Apply knowledge of computing and mathematics appropriate to the discipline;	1.1	-----	-----
√	b) Analyze a problem, and identify and define the computing requirements appropriate to its solution	2.1	Ex. 2	33.5%
√	c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;	2.2	-----	-----
√	d) Function effectively on teams to accomplish a common goal;	3.1	-----	-----
√	e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;	1.2	-----	-----
	f) Communicate effectively with a range of audiences;	4.1	----	-----
	g) Analyze the local and global impact of computing on individuals, organizations and society;	2.3	----	-----
	h) Recognition of the need for, and an ability to engage in, continuing professional development;	2.4	-----	---

√	i) Use current techniques, skills, and tools necessary for computing practices.	1.3	-----	----
	j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;	1.4	-----	-----
√	k) Apply design and development principles in the construction of software systems of varying complexity;	1.5	Ex. 3	50%
√	General Question	-----	Ex. 1	16.5%

This exam comprises 3 exercises. Make sure you read each exercise carefully before attempting an answer. Be sure to clearly indicate your final answer for each exercise. Also, be sure to state any assumptions that you are making in your answers.

Good luck!

Exercise 1: (General Question 5 points)

- A methodology is:
 - System Development Life Cycle (SDLC)
 - Collection of diagrams
 - Collection of models, tools, and techniques
 - A diagram (or set of diagrams) which represents real world domain objects
 - Comprehensive guidelines to follow for completing every SDLC activity.
- Which of the following statement is FALSE about classes and class diagrams?
 - Class diagrams focus on the execution and flow of the behavior of a system.**
 - Each specific type of class is called an object.
 - Class diagrams are used to capture the static relationships of software.
 - A class represents a group of things that have common state and behavior.
- Which of the following UML diagrams describe the **behavioral views**?
 - Sequence diagrams**
 - Class diagrams
 - Statecharts**
 - Use case diagrams
 - Collaboration Diagram
 - Activity diagrams**
- Which of the following UML diagrams describe the **structural views**?
 - Collaboration Diagram**
 - Class diagrams**
 - Statecharts
 - Sequence Diagram
 - Use case diagrams**
 - Activity diagrams

Answer:

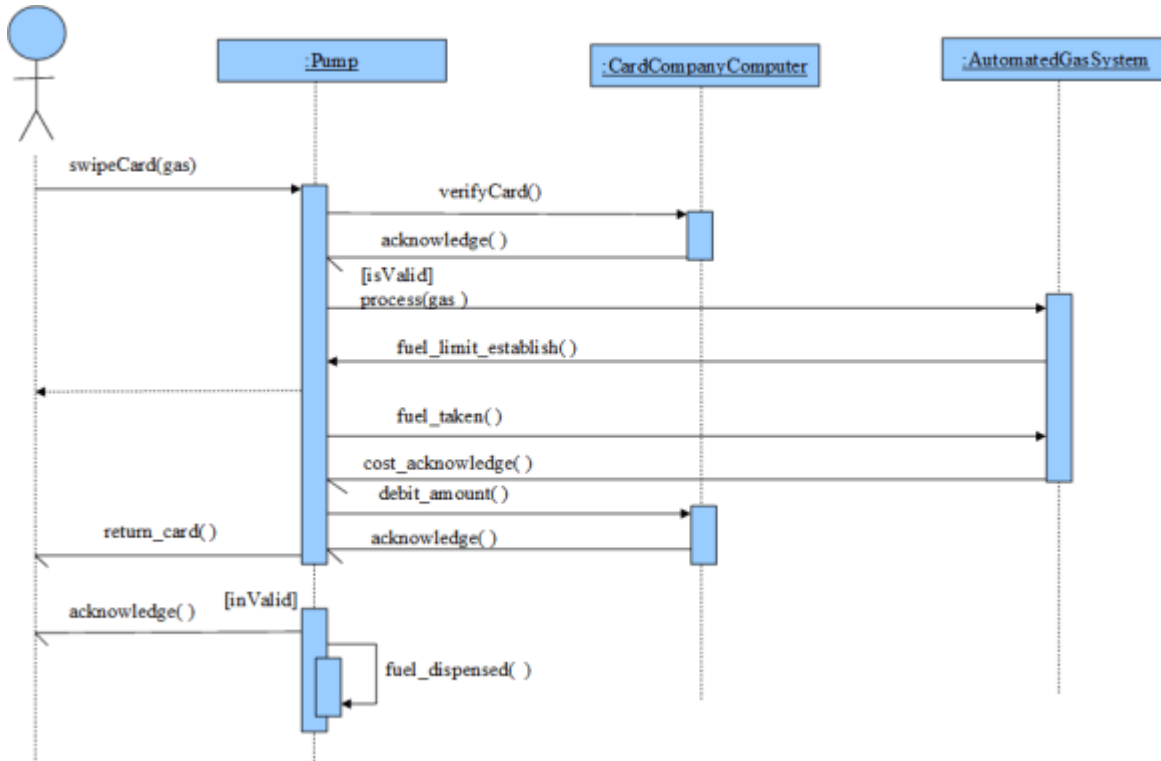
1	2	3	4
c-e	a	a-c-f	a-b-e
1	1	1.5	1.5

Exercise 2: (Sequence Diagram) (10 points)

A petrol (gas) station is to be set up for fully automated operation. Drivers swipe their credit card through a reader connected to the pump; the card is verified by communication with a card company computer (CCC). The CCC send an acknowledgement to the pump. The pump activate the automated gas system (AGS) to process the required fuel. The AGS inform the pump that the fuel limit is established. The driver may then take the fuel required. When fuel delivery is complete and the pump hose is returned to its holster, the driver's credit account is debited with the cost of the fuel taken. The credit card is returned after debiting.

Draw the Sequence Diagram of the petrol station.

Answer:



Exercise 3: (Domain Model) (15 points)

RiyadhClub Book is a chain of 15 Book stores scattered throughout a major metropolitan area. The owner of the chain plans to build a new book rental system for it. Each store has a stock of books for rent and has many employees and one of these employees is considered as a manager. The system needs to keep track of each book's title, domain.... Each book covers many topics. A topic is composed of a number of chapters. Because the order of the chapters is important, the system will need to know, for any given chapter, what the next chapter is, and what the previous chapter is. In addition to tracking each title, the system must track each book to note its purchase date and rental status (rental date and return date). Borrowers' information are also processed by the system. Therefore the RiyadhClub Book has two kinds of Borrowers authorized to rent books: SilverBorrowers and GoldBorrowers.

Identify conceptual classes and use them to build the UML class diagram. Add possible attributes to the classes and make sure to show all the relationships (aggregations/compositions/inheritance).

Answer:

