



King Saud University

College of Computer and Information Sciences

Computer Science Department

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| Course Code: | CSC 342 | |
| Course Title: | Software Engineering | |
| Semester: | Spring 2017 | |
| 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. 1 | 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. 2 | 66.5% |
| √ | General Question | ---- | ----- | ----- |

This exam comprises 2 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: (Requirement Specification: Use Case Diagram) (10 points)

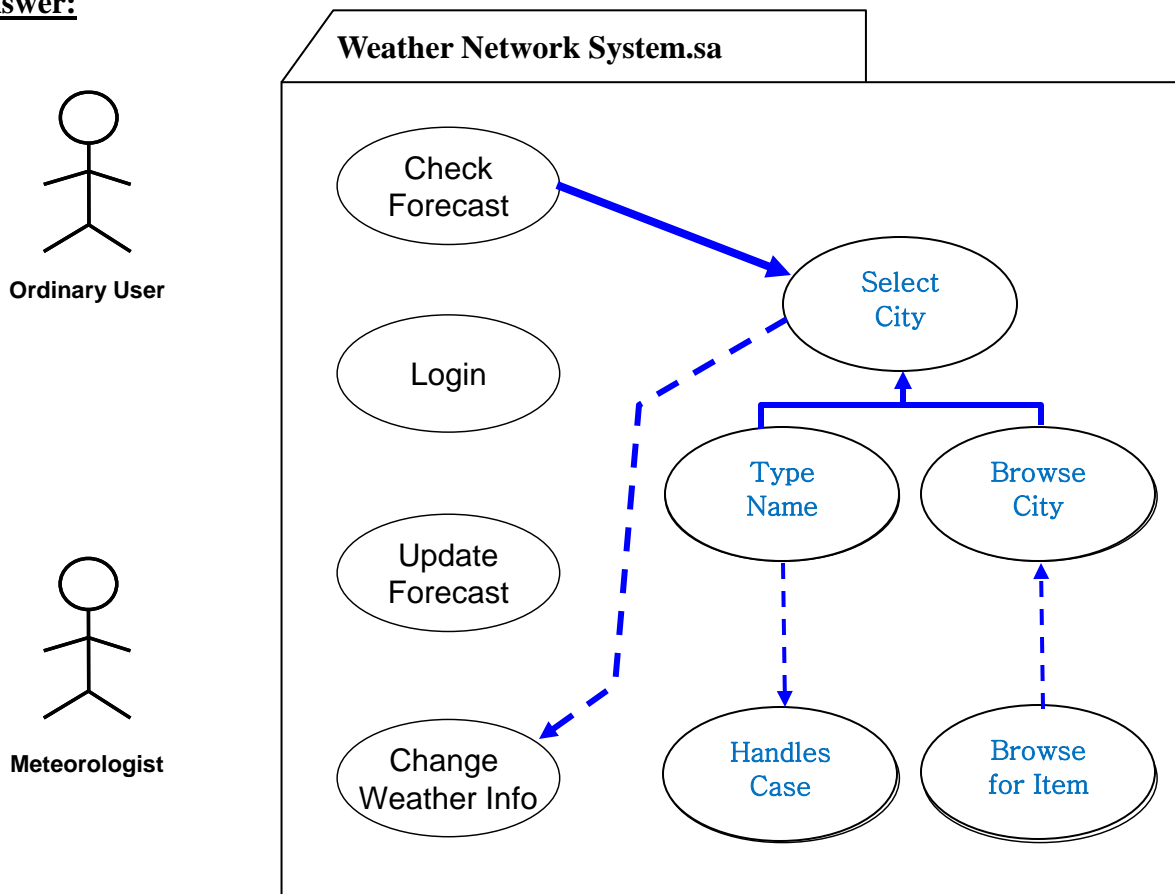
To check the weather for your region before travelling, you may access the Web site **WeatherNetwork.sa**. This site allows the *Ordinary User* to obtain an up to date forecast for any city in Saudi Arabia. To check the weather between Riyadh and Djedda, for example, the user accesses the Web site, and clicks the “*Check Forecast*” button. To obtain the forecast for his region, the user enters the name of the closest city in a “*Select City*” field. The city is selected by one of two methods:

- i) *Select City by Typing Name*. If this is an *Attempt to Select a Non-Existent City*, the system handles that case.
- ii) *Select City by Browsing*. This uses a step called *Browse for Item*.

The *Meteorologist* for the Weather Network can do everything an ordinary user can do and, in addition, can update the forecast. To *Update Forecast*, the Meteorologist first does a *Login* to the site, then a *Select City* followed by *Change Weather Info*.

Consider the following incomplete use case diagram and complete it. Use appropriate relation labels and direction arrows between use cases when needed.

Answer:



Exercise 2: *(Domain Model) (20 points)*

BookClub is a chain of 10 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 specialized on one domain of books and each domain has many type of books for rent. Each store has many employees and one of these employees is considered as a manager. 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. Borrowers' information are also processed by the system. Borrowers can rent books. 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). 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:

| | | Result | | | | |
|--------------|-------------------------------|--|--------------------|-----------|--------------|---|
| Question No. | Relevant ABET Student Outcome | Relevant NCAAA Student Outcome | SO is Covered by % | Full Mark | Student Mark | Assessor's Feedback |
| Ex. 1 | b | 2.1 | 33.5% | 10 | | |
| Ex. 2 | k | 1.5 | 66.5% | 20 | | |
| Totals | | | 100% | 30 | | |
| | | I certify that the work contained within this assignment is all my own work and referenced where required. | | | | Feedback Received: Student Signature: Date: |
| | | Student Signature: Date: | | | | Student Signature: Date: |