جامعة بيرزيت

BIRZEIT UNIVERSITY

Computer Science Department

Software Engineering (COMP 433)

Second Semester 2005/2006

Midterm Exam [redacted] 26/04/2006

Question One [50 marks]

A) What is the distinction between functional and non-functional requirements? Give example of each of these types of requirements?

B) How is software engineering different from traditional engineering such as mechanical engineering?

C) What are entity classes? What are other categories of class need to be distinguished in class modeling? Explain?

D) Give an example of an <<include>> relationship and an <<extend>> relationship between use cases. What is the main difference?

E) What is wrong with the following Requirements?

1. HomeBudget shall display a convenient interface for entering personal data.
2. SatControl shall compute the predicated time it takes to circle the Earth on the current orbit, and the actual time taken to circle the Earth on the previous orbit.

Question Two [50 marks]

Read the following case study and answer all the questions that follow:

1. A system is to be developed to support the following dentist office system. Whenever new patients are seen for the first time, they complete a patient information form that asks their name, address, phone number, and brief medical history, which are stored in the patient information file. When a patient calls to schedule a new appointment or change an existing appointment, the receptionist checks the appointment file for an available time. Once a good time is found for the patient, the appointment is scheduled. If the patient is a new patient, an incomplete entry is made in the patient file; the full information will be collected when they arrive for their appointment. Because appointments are often made so far in advance, the receptionist usually mails a reminder postcard to each patient two weeks before their appointment.

A) Draw a use case diagram for the above system, showing relationships between different use cases.

B) Produce a narrative use case description for the use case of "booking an appointment". Show the main flow of events and any possible alternative flows

C) Identify a list of classes and a draw a class diagram for the above system that shows the classes, associations and attributes.

D) Based on the Requirements Specification Template given below and use your narrative description for the "booking an appointment" use case, to specify one functional requirement and another non-functional requirement.

Note any assumption that you make as you develop the diagrams.

Requirement #:	Requirement Type:	Event/use case #:
Description:		
Rationale: .		
Source: Fit Criterion:		

A- Functional requirements: provide a service to a system, show ~~to~~ how the system should react for a specific input.
What is the system behavior for a specific situation.
ex: The ~~eg~~ Passenger should declare a Phone number to call if any error occures.

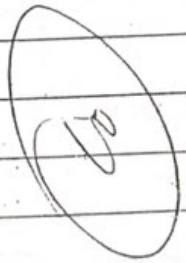
Nonfunctional: we talk about ~~have~~ the usability of the system we talk about the interface buttons, color, Logo and fonts. ~~and~~ if we talk about the Reliapibity of the system, the degree to which the system can do the jobs. The Performance that the system provide. And the Responsibility like responce time, and we talk about the constraints of the system, which language to use at what time to responce and Legacy
ex: The system should send a message during 5 minits from the response.

B Software engineering: ~~here we build a software the software will be some thing integrable~~ The software engineering dowing a specific application during a limitation of time and budget and while change occures for the things. The software engineering dowing model activity to dealing with

complexity, and Software engineering is problem solving activity; find the solution. Software engineering knowledge is not linear maybe a small information change all the model and Rational activity.

The Software engineering develop and evolution the systems.

The Traditional engineering ~~know exactly~~ doing a specific procedures for doing a job. and maybe one person do all the system don't work in algorithms and build a tangable thing.



C - Entity class describes the objects of the system we can know it from the flow of events from the use case. It will be ~~know~~ known or something we want to store information about it ~~exact~~. Entity have attributes to describe it and methods to do. ~~or~~ we use it to build a class diagram.

The class diagram also contains the boundary which will be manage the react between the actors and the system, like interface, buttons

And we have a control which manage the react between the ~~actors~~ entity and the boundary this control begin with the use case and die in the exit condition.

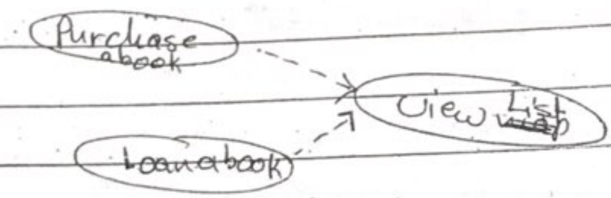
if we can't make a good control here the entry ~~and~~ or the exit condition was wrong.

In class diagram the classes relate with each other by a relation ship (association) and the object by a link.

~~The relationship may be include or extend~~

And we have aggregation or inheritance relations between the ~~obj~~ classes.

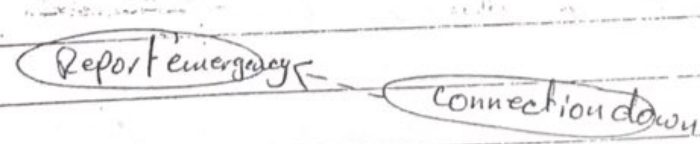
D- Include :



here we have ~~a~~ three use casses
in the purchace abook use case the
actor will invok the view list use case
at the time when he want to buy a book
and in Loanabook the actors invok
the view list also to see the book
in ~~the~~ offered.

صون في include يكون شئ use case موجوده
داخل use case تانية . وده امنع التكرار في الوقت
اللي هحتاج اني استدعي ال use case دي بكتب
اني استخدمت صريك use case ، واذا ما عرفين
الحالات اللي بالذات يدي استدعيها بدون شرط include
داخل Quality Requirement.
⇐ داخلاً كل ما يدخل Purchase usecase ، يستدعي viewlist
ونفس الشئ في Loan use case.

Extend



صون في extend في حالة اني صار عندي مثال في
~~co~~ connection ، اذا بحيث Report ، يستدعي connection
Down Use case

عشان انا محتاج اعرف ده مالـ ستخدم والسهم يكون
عكس include.
عنده extend تكون في اذا احتاج فرصت help او
ظهر عندي error مثلاً.

(٦٥)

E- 1- It's not verifiable statement.
شي بتوضح في الجملة انو الـ Home Budget الي رح يكون
interface بس يكون ملائم انا ممكن مش محدد.
التوضيح كمان نوع interface او شكل حتى الادخال entering data

2- Here also its not verifiable.
لازم يحدد اي هي Circles الي لازم يعملها تلوين في
Orbit محطات الكل مش كلهم موجودين في الجمل

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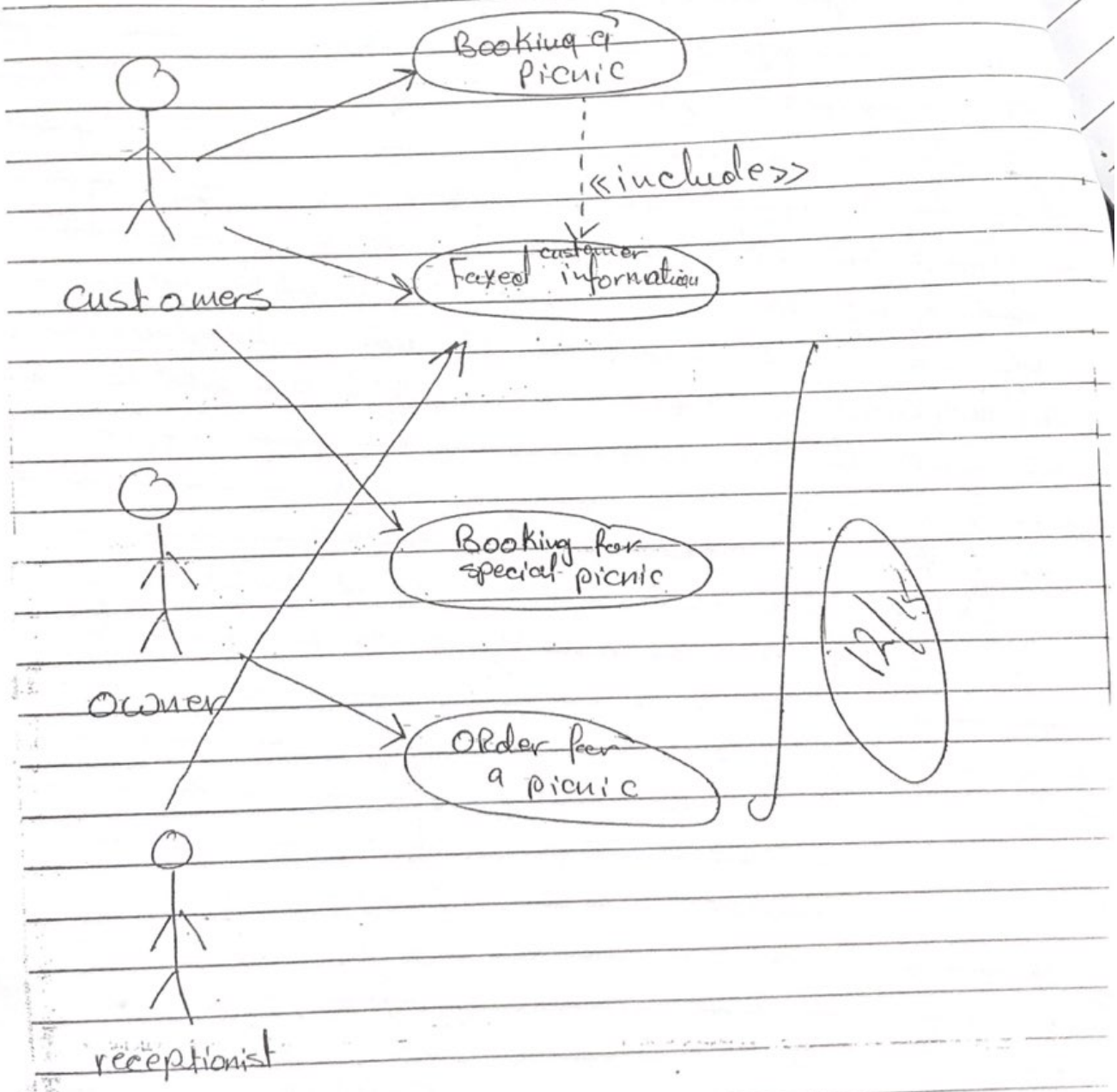
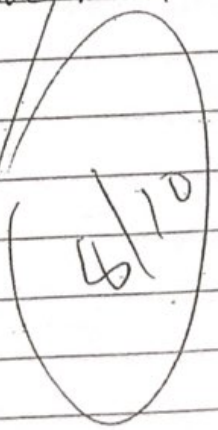
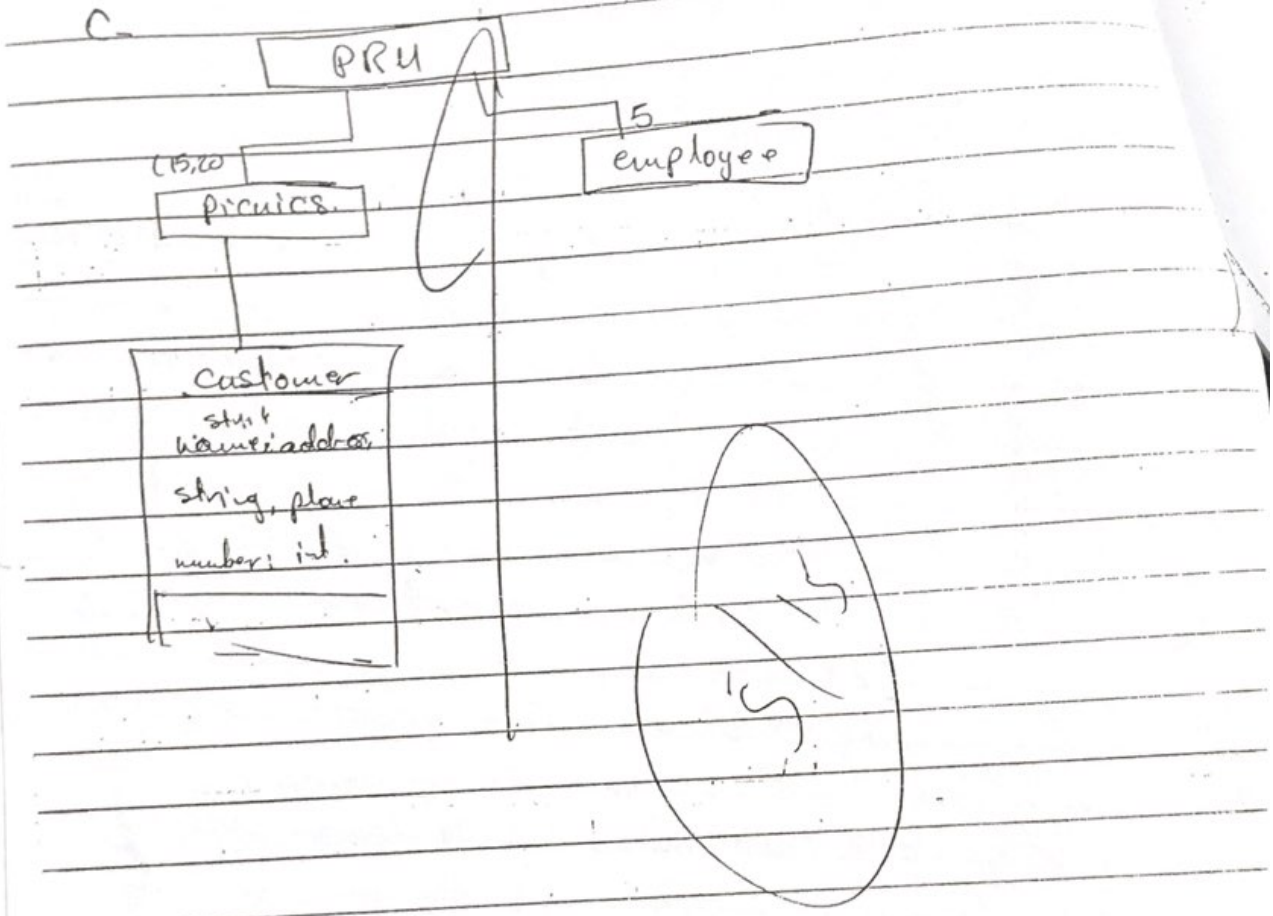
Question Two:



B. use case name: Booking a picnic
actors: customers; receptionist.
Flow of events:
1. The customers call the PRU.
2. The receptionist give him a menue offered by PRU, and price information.
3 The customer choose one of standard menues
4. The receptionist stored information about the customer.
5. Faxed use case include here.
6. The contracts stored and sorted by week.
Entry condition: The customer actors call the PRU.
Exit condition: The customer receives his booking picnic.
Quality Requirement: The PRU should make the order after 7 days from the Booking.



C-


PRH
(5,20
picnics
5
employee
Customer
string address
string, phone
number; int.