

Exercise 1 Each correct answer counts 1.5 points. Each wrong counts -0.5 **Total 27 points**

- A. Ch1 - Software is defined as computer programs without associated documentation. **False** is should be "with".
- B. Ch1 - Software products are always developed for a particular customer. **False** it should be "or may be developed for a general market".
- C. Ch1 - Software validation is the phase where the software is checked to ensure that it is what the customer requires. **True**
- D. Ch2 Feasibility study, elicitation and analysis, specification, and Requirements validation are the principal sub phases of requirement engineering. **True**
- E. Ch3 Test-first development means that when a system feature is identified, the tests of the code implementing that feature are written before the specification. **False**
- F. Ch3 According to test first development, tests should be automated and all tests should be run when a new increment is added to the system. **True**
- G. Ch4 Organisational requirements are general requirements derived from policies and procedures in the customer's organization. Organizational Requirements are functional requirements. **False**
- H. Ch5 Generalization is used to simplify the models of a system with many similar objects by associating with a super-class of common architectural patterns. **False**
- I. Ch6 An architectural pattern is a stylized abstract description of good practice in architectural design that has been tried and tested in different systems and environments. **True**
- J. Ch7 Software design is an activity in which software components and their relationships, based on a customer's requirements are identified. This activity is highly repetitive and can be automated. **False**
- K. Ch8 Software inspection is concerned with exercising and observing product behaviour (dynamic verification) **False**
- L. Ch9 Maintenance efforts may be triggered by functionality addition or modification (65%); fault repair (17%); environment adaptation (18%). **True**
- M. Ch10 A socio-technical system will **always** produce the same sequence of outputs from the same input sequence **false**
- N. Ch22 Project reporting is not a management activity **False**
- O. Ch23 Milestones are points in the schedule against which you can assess progress, for example, the handover of the system for testing. **True**
- P. Ch 24 Modularity is a quality attribute **True**
- Q. Ch24 Schedulability is a quality attribute **False**
- R. Ch24 Quality attributes are functional requirements **False**

Merknad [LJ1]: It should be code

Merknad [LJ2]: Should be not functional

Merknad [LJ3]: Should be attributes and methods

Merknad [LJ4]: Should be creative activity

Merknad [LJ5]: This is testing

Merknad [LJ6]: Should be not always

Case Description (to be used in exercise 2, 3, 4)

Company A has agreed to develop a *Mobile Based System for Children* (in the following called MBSC) for a hospital. The project has been initiated by the local parent association of chronically ill children. The organization is strongly involved in the project and commits to participate in the process of developing the system.

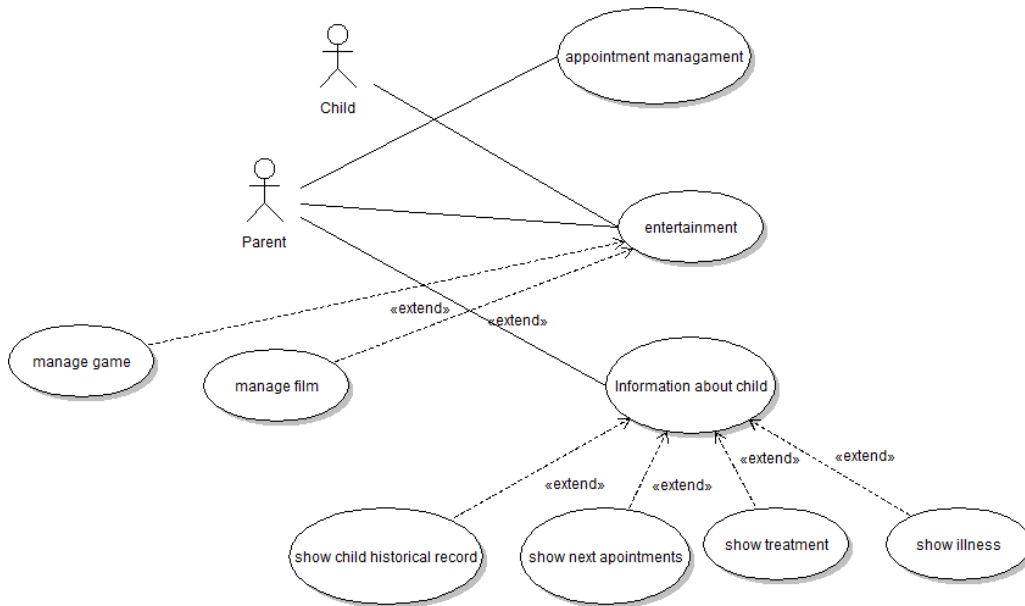
The MBSC system will augment (not substitute) the existing hospital information system and it will include the following main functionalities: 1) information to parents and children about the child's specific illness and treatment; 2) appointment management including active reminders of appointments; 3) entertainment of children before and during treatments by simple games. The system will only support mobile based devices. For each child, one or more parent can register with her own mobile phone number and create a user. When a user wants to search for information about a child and/or to book appointments, she logs in the system while the system checks her identity and authorizes her.

Users are notified with an SMS 24 hours before each appointment. When a visitor arrives at the hospital, the visitor uses his mobile to scan a QR CODE that is available at the entrance of the hospital. Then the system will ask the visitor if he wants to register and if yes, it will ask for his identifier and retrieve the name of the visitor from the backend visitor system. It can also interact with other backend system to retrieve additional information about the visitor. No registration is required to make use of the entertainment functionality, such as videos and games. The users of the system are parents, children, and the administrator.

The project will start the 1st week of January 2013. Up to three persons of company A will work on the project.

Exercise 2 Requirements 30 points

- a) Make use case diagrams for the main functions (tasks) in the system (F1) information, (F2) appointment management, (F3) entertainment.



The actors are parents (connected to all requirements); children connected only to req 3. Administrator is not required but ok if they have. They can have user as a superclass of parent, child.

b) Given that one of the main functional is “F2 Appointment Management” and one of its sub functions is “F2.1 Book Appointment”, list the other sub-functions F2.

Requirement ID	Description
F2	Appointment management
F2.1	Book appointment
F2.2	Appointment remind
F2.1.2	Check availability of hours for given specialist

c) Specify a scenario description for the requirement “Provide entertainment”.

Scan bar code.
Present a menu of videos/games.

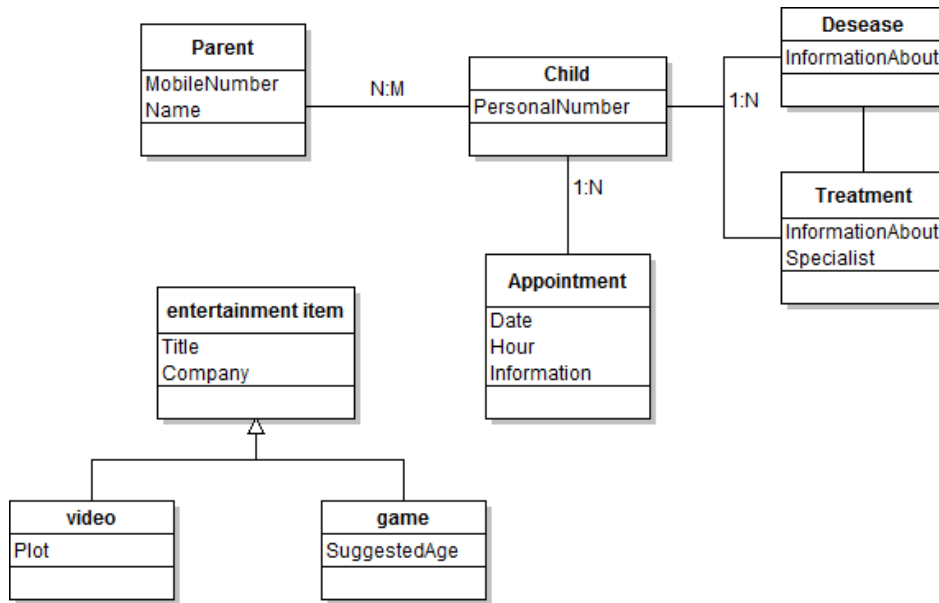
The user can choose to download a video and subsequently download it.

If the format of the video is not supported the user is notified

The user can choose to play a game online.

d) Specify the sequence diagram for “Book an appointment”.

e) Define the logical entities of the system and their attributes (class diagram):



Exercise 3 Planning 23 points

a) You, as a project manager, argue for the use of an agile method for developing such a software system.

List the most important reason that motivates your choice. You can add up to five reasons.

Merknad [PHM7]: I think you should remove this limitation, or at least increase it to 5.

1. The parents are strongly involved
2. Short development time
3. Small development team
4.
5.

b) Develop a plan for implementing this project as 3 Scrum Sprints. How long will the project last? Which will be the cost in man weeks?

A Scrum Sprint is a short (3-4 weeks) planning unit in which work to be done is assessed, features are selected for development, the software is implemented and delivered to system stakeholders.

3 Scrum Sprints, 4 weeks each, 2 engineers full time, one manager 50%. Duration = 12 weeks Cost= 30 man weeks. It is important that the student understand that each of the main requirements will be a sprint.

c) Give start, finish date, and duration for the development of the three main functions (tasks). Specify duration of tasks in weeks or days. Be clear about which unit you use. Make a resource allocation plan.

Name	Start	finish	Resources	Man/weeks
information	T0	T0+4w	Engineer1 100% Engineer2 100% ProjectManeger 50%	10
booking	T0+4	T0+8	See above	10
entertainment	T0+8	T0+12	See above	10
Total				30

Merknad [PHM8]: I'm not sure why there are so many columns in this table? Should it be a gantt chart?

Exercise 4: Testing (20 points)

Consider the MBSC system.

- a) Briefly describe the main issues you plan to test the system, provided that it is decided that this project is implemented as a 3 Scrum Sprints.

Information, booking, and entertainment will be tested separately at the end of each Scrum iteration.

- b) Write 2 scenarios that can be used to help design tests for F1

F1 information

Scenario 1 Parent A wants to acquire more information about the disease of her child and which are the available treatment possibilities. The system should be able to provide information about both disease and treatment.

Scenario 2 In order to acquire more information about the disease of her child, Parent B wants to see which other children at the hospital have the same disease and which treatment they get. The system should not provide information about other children to unauthorized parents.

c) Write high level Test cases (Testdata, preconditions and expected results) for testing the three main functions. Write at least two test cases for each of them.

Merknad [PHM9]: For consistency, I would change this to "main functions"

Provided we keep 1) information to parents and children about the child specific illness and treatment; 2) appointment management including active remind of appointments; 3) entertainment of children before and during treatments by simple games.

Function	Test data	Preconditions	Expected results
F1 information	Illness name	The user is logged	Information about illness
F1 information	Child personal number	The user is logged	Name of illness, record of treatments, future appointments
F2.1 Book	Child personal number, preferred dates	The user is logged	Appointment
F2.2 Delete	Appointment	The user is logged	
F3.1 Show Video	VideoName	The phone can read the video format	Video
F3.2 Game	GameName	The system supports the given mobile	Game