
American University of Beirut
CMPS253- Professional Practice

Final – Spring 2005

Time: 120 minutes.

Dr. Dargham

Name : _____

Id : _____

I. General (16 pts)

- 1- What are the different aspects of software design? In other words, what do we explicitly do at the design phase? Explain very briefly each of the activities. (4 pts)

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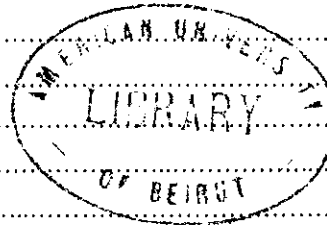
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- 2- In your organization, although the average salary is \$4000/month, the weighted average salary for cost estimation purposes is \$11,000/month. You have determined that a particular project will take 7 person-month to complete. How much would you estimate this project will cost financially? (2 pts)

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- 3- Consider the development processes introduced in the course. Which ones give you the most flexibility to change in reaction to changing requirements? (2 pts)

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- 4- Manny's Manufacturing must decide whether to build or buy a software package to keep track of its inventory. Manny's computer experts estimate that it will cost \$325,000 to buy the necessary programs. To build the programs in-house, programmers will cost \$5000 each per month. What factors should Manny consider in making his decision? When is it better to build? To buy? (4 pts)

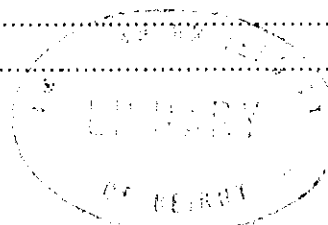
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- 5- You are asked to improve a data entry program used to enter a patient's personal information when he or she is first admitted to a hospital. Admission clerks have to enter each new patient's name, address, telephone number, and various other pieces of data. The customer tells you that the admissions clerks make an unacceptable number of mistakes that contaminate the database and cause administrative problems. You are told that the problem is lack of clarity in the user interface, which leads the clerks to put information in the wrong places. What however is the real problem and how might understanding this affect potential solutions? (2 pts)

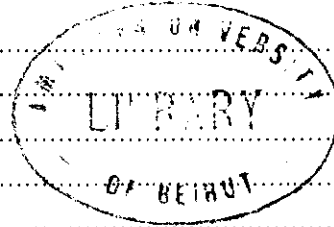
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- 6- This is the inverse of the previous exercise. This time, you are told by the customer that the problem is, 'The data-entry system is not "high-tech" enough'. Hence you are asked to write a system that scans drivers' licenses and other documents in order to enter a new patient's name and address accurately and quickly. What mistake could you be making if you accept this problem statement and proceed to do exactly what the customer asks? (2 pts)

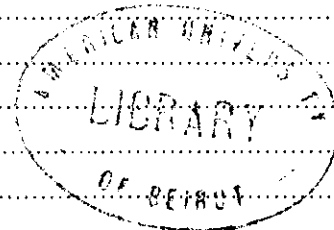
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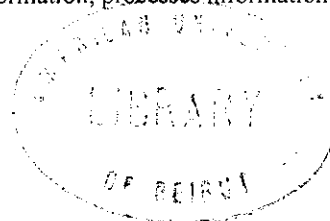
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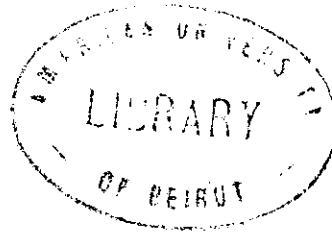
II. True or false (20 pts)

- a- T F Despite its drawbacks, LOC is widely used as a metric of product size.
- b- T F A milestone is not always a deliverable.
- c- T F In a use-case diagram a user and an actor represent the same thing.
- d- T F Design phase is the most important activity of software development.
- e- T F A data flow can represent both input and output information.
- f- T F A software quality metric that can be used at both the process and project levels is defect removal efficiency (DRE).
- g- T F It is not useful to consider personal issues when taking managerial decision.
- h- T F Since the analysis phase is useful to understand the requirements; we can skip it when the customer and the developer of an application are the same person.
- i- T F The software metrics chosen by an organization are driven by the business or technical goals an organization wishes to accomplish.
- j- T F The DD should include, beside the data information, processes information with their input and outputs data.

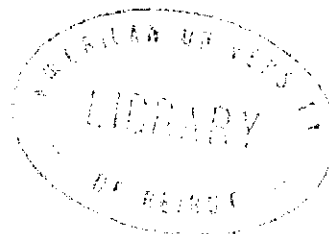


III.DFDs (28 pts)

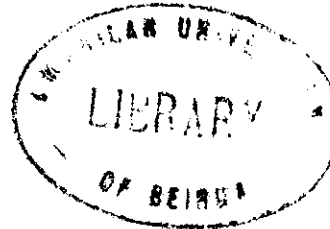
- 1- Draw level 0 and level 1 of the DFD involved in a typical (complete) visit to a physician. During the visit patient's information are needed, some of them are created others are updated. She/He is examined, given medication and billed. Refine only one process of the level 1 (do the level 2 of one process).
 - a) Draw the context level diagram of the system (3 pts)



- b) Draw the level I diagram, indicate data flows, data bases and two main processes. (12 pts.)



- c) Draw the level II diagram of one process (4 pts).



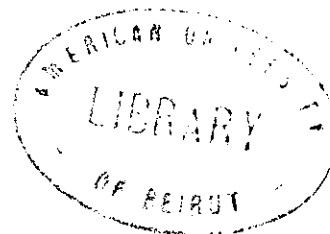
- 2- A software system is to be developed to automate a library catalogue. This system will contain information about all the books in a library and will be usable by library staff and by book borrowers and readers. The system should support catalogue browsing, querying, and should provide facilities allowing users to send messages to library staff reserving a book that is on loan. Identify the principle Data and functionalities of this system (6 pts)

Data:.....
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Functionalities.....
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IV. Use case and state transition diagram (22 pts)

- 1- You are asked to develop an application to manage all related courses issues in your university (offering, registration, grading....). Draw the use-case diagram of this system including three actors and 4 use cases (7 pts).



2- For the same application, draw the state transition diagram for a course section class. Identify 5 states and their transitions (15 pts). Your diagram should represent the following behavior:

When first planned, a course section is not ready to receive students until the registration is opened. The system starts accepting students' registration. The course section can accept request to register, but the course will not be taught until the class size reaches a certain minimum. When this condition becomes true, the system continues to accept registration until reaching a certain maximum, at which time the course section is closed. The course section can also be closed by a closeRegistration event because that the registration deadline has passed. If there are not enough students, closing a course section has the same effect as canceling it. Also, at any time the course section can be cancelled.



V. Multiple choices (8 pts)

Circle one right answer for each question

1. An organization that understands how to achieve quality will measure:
 - A. managers and practitioners
 - B. process and product
 - C. consistency and complexity
 - D. programs and data

2. Project data is normally collected:
 - A. throughout the entire software project
 - B. after the project has been completed
 - C. before the project begins
 - D. all of the above

3. Function points are a measure of software that:
 - A. indicate the functionality delivered by the system
 - B. indicate the number of inputs and outputs produced by the system
 - C. indicate the productivity of the system
 - D. indicate the number of user queries for the system

4. Software feasibility is based on which of the following
 - A. business and marketing concerns
 - B. scope, constraints, market
 - C. technology, finance, time, resources
 - D. technical prowess of the developers



VI. ERD diagram (6 pts)

- 1- Construct an E-R diagram for a car insurance company that has a set of customers, each of whom owns one or more cars. Each car has associated with it zero to any number of recorded accidents.