

Lesson 1 Exercises

Software life-cycle

Start: Week of February 8th.

Duration: 1 week.

1) What is the feasibility study worth? What aspects should be studied? Which is more important?

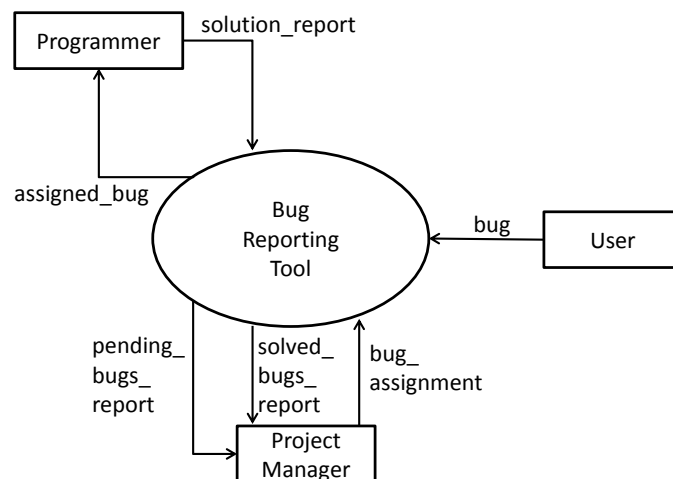
2) Classify the following requirements into functional, and non-functional. Indicate the type of the latter.

1. The application must include a menu option for printing all listings.
 2. The Database of the application must support up to a maximum of 5 million records
 3. The credit authorization response must be less than 30 secs, 90% of the times.
 4. The point of sale device should have a large touch screen. The text must be visible from one meter.
 5. The system must have a robust recovery when access to external systems (such as inventory, taxes, etc.) fails
 6. The system must include versions of the help in Spanish and English.
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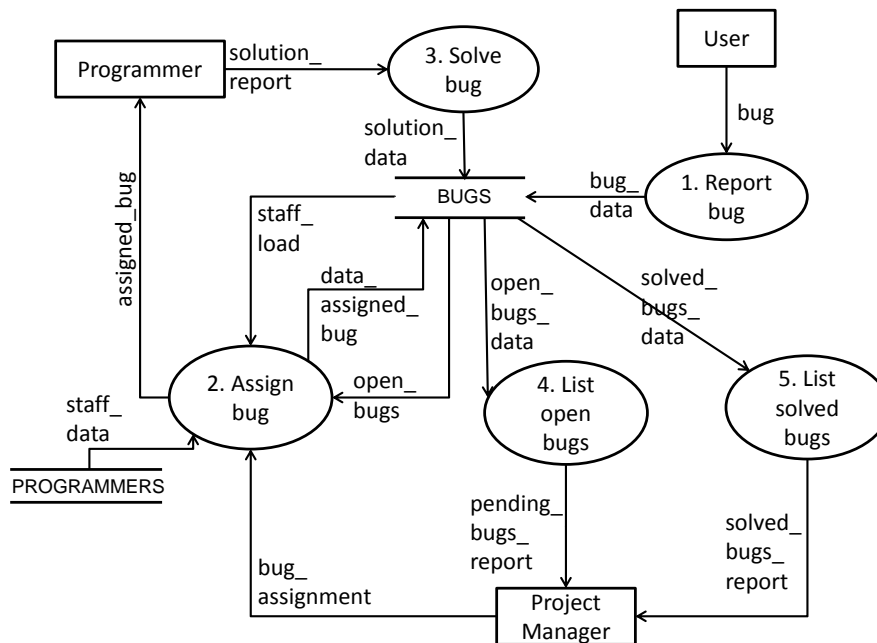
3) From the following requirements, indicate which ones do not meet some of the correctness attributes:

1. *"...up to 15 buses will be drawn within the same window. Over this number a different window will be used."*
 2. *"The system will have a simple user interface."*
 3. *"Users must enter their password in less than 15 seconds since they wrote their ID."*
 4. *"The response time for all commands will be less than 0.1 seconds. The response time for the 'DELETE' command will be less than 5 seconds."*
 5. *"The system will have an acceptable response time."*
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4) Describe the operation of the following application, modeled using a Data Flow Diagram. What other aspects of the application should be modelled in the requirements phase?



Level 0



Level 1

5) Model the application of exercise 4 using a Use Case diagram. Describe the “Assign Bug” scenario in which the Project Manager assigns a pending bug to a Programmer.

6) The “1001 sandwiches” restaurant chain orders you to carry out a computer application to automate the service to the customers of its different stores. The operation is as follows:

When a customer enters the restaurant, a waiter assigns her a table. Once at the table, the client fills out a form with the sandwiches and drinks she wants. Now this selection is made with pencil and paper, but it is intended that the client do so using a touch screen device. The customer can select either specific sandwiches from a list of 100, or among “*the most popular*”, or among the “*chef’s selection*”. The system must therefore present the 20 most requested sandwiches of that day, as well as the 12 sandwiches selected by the chef. If a customer wants more food or drink, she makes a new selection and the process is repeated. When the customer makes the order, the current price of its consumption is presented.

The information on the food selected by each client is presented immediately to the cook (in a device installed in the kitchen), and that of the drink to the bartender (in a device installed in the bar). When the food or the drink are ready, the cook or the bartender indicates it in the system. This presents a notice to the waiter assigned to the corresponding table (who is equipped with a mobile device), which is responsible for bringing the products to the table.

The system must also control the food stock in the warehouse. The cook is responsible for entering twice a day information about new food purchased or used. When an ingredient is out of stock, the customers should not be able to select the corresponding sandwiches.

Finally, when a customer leaves, she indicates it through the table device. This causes her receipt to be printed at the central cashier, and a notice is given to the waiter assigned to those tables, who charges the client (only cash is accepted). At any time before leaving the table, the client can optionally fill out a form to evaluate the service received. This form must be customizable.

- a) Create a use case diagram.
 - b) Describe the scenario corresponding to a client requesting food / drink. Please include both the main success flow and the alternative flows if any.
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7) In software design, what is modularity? And information hiding?

8) What are unit tests and when should they be performed?

9) If testing is done using a white box approach, black box testing does not need to be done. True or false?

10) Select the most appropriate life cycle model for the following scenarios.

1. A software to control a nuclear plant, with the objective of anticipating possible failures, detecting anomalies, recommending tactics and tracking the actions carried out by operators. The definition of the software system is conflicting and presents high risks at different stages of development. In addition, the tests are difficult to perform, since the system can only enter in production once it has been fully tested. Hence, a simulator is planned to be built for this phase.
2. A software to manage a sales department of an editorial where the functions are clearly identified. The software system to be implemented barely presents risks, its development phases are well defined and your company has great experience in the development of this type of applications.
3. A software for planning the stock of wines that a winery has in different warehouses. The system will use planning algorithms based on market demand and supply. This application does not present, a priori, major risks although it is expected that new requirements may arise during development.
4. An application to support accessing information about the artworks in a museum through the Internet. The client believes she has a clear understanding of the requirements of the application. However, the Software Engineer does not think the same, so she wants to verify the user requirements as soon as possible, in particular those related to the functionality and user interface. Technically the application does not seem to present any problem.