

Requirements and Specification, ESOF 328, Spring 2021
Final, March 22

Name _____

This exam is to be completed individually without the use of the text, notes, the Internet, or any other items.

Multiple Choice (20 pts.)

1. Select the best category for the information: System X must use an MS SQLServer database. (4 pts.)
 - a. Business rule
 - b. User requirement
 - c. Functional requirement
 - d. Non-functional requirement which is not also a quality attribute
 - e. Quality attribute

2. Administrators, graduates and seniors can create and edit the profiles in the system. (4 pts.)
 - a. Business rule
 - b. User requirement
 - c. Functional requirement
 - d. Non-functional requirement which is not also a quality attribute
 - e. Quality attribute

3. Tech Connect shall only be accessible to authenticated users within Tech Connect. (4 pts.)
 - a. User requirement
 - b. Functional requirement
 - c. Non-functional requirement which is not also a quality attribute
 - d. Quality attribute
 - e. Design constraint

4. Select the best description for when use case A “extends” use case B. (4 pts.)
 - a. When use case A may or may not include use case B.
 - b. When use case B may or may not include use case A.
 - c. When use case A always includes use case B.
 - d. When use case B always includes use case A.
 - e. None of the above.

5. Which of the following is least likely to be a skill needed by the business analyst? (4 pts.)
 - a. Listening skills
 - b. Facilitation skills
 - c. Analytical skills
 - d. Modeling skills
 - e. Project management skills

Short Answer (30 pts.)

6. List the 4 major requirements management activities. (5 pts.)

Version control
Change control
Requirements status tracking
Requirements tracing

7. Imagine that you have become a business analyst for a software development company. An analyst recently hired on the project wonders why both use cases and functional requirements are being created. He claims it would be more efficient creating one or the other. Give arguments for creating both use cases and functional requirements. (5 pts.)

Typically, use cases are at a higher level than requirements. Use cases shows interaction between a user and a system. If there is work that the system does without user interaction, it won't be shown in a use case.

While developers can work from use cases, good functional requirements make development easier.

8. What is the most important reason for prioritizing requirements? (5 pts.)

To deliver the maximum business value as quickly as possible. Typically the entire system is not developed at the same time. Work on those sections first which will provide the maximum business value. (This is essentially the same as providing the highest value at lowest cost.)

9. What are the most important issues to be considered in order to prioritize requirements? (5 pts.)

There are four issues to be considered:

- i. The relative importance to the customers,
- ii. timing at which capabilities needs to be delivered,
- iii. requirements that serve as predecessors for other requirements, and
- iv. the cost to satisfy a requirement

10. List the 3 dimensions of timing requirements.

(5 pts.)

Through put
Latency / execution time
Predictability

11. The process for manufacturing silicon wafers for RAM memory involves nine steps. Between steps 3 and 4, the temperature must be logged. List 5 issues which a business analyst should remind the client to consider due to this real time logging requirement.

(5 pts.)

Sample answers:

1. Periodicity (frequency) of execution of the tasks and their tolerances
2. Deadlines and tolerances for execution of each task
3. Typical and worst-case execution time for each task
4. Consequences of missing a deadline
5. Minimum, average, and maximum arrival rate of data in each relevant component state
6. Maximum time before the first input or output is expected after a task initiates
7. What to do if data is not received within the maximum time before the expected first input (time out)
8. Sequence in which tasks must run
9. Tasks that must begin or end execution prior to other tasks beginning
10. Task prioritization, so you know which tasks can interrupt or preempt others, and on what basis

Essay/Problem Solving (50 pts.)

At the final Tech Connect meeting, the clients asked for “pin contacts” functionality. The statement was made “Once I have searched for someone, I don’t want have to have to start from square one when I want to find them later.”

12. The final SRS “User search” use case is shown below. Following that is a template for a new use case. Capture the pin contacts functionality by modifying the “User search” use case, or creating an entirely new use case. Capture the functionality in a way that that clients are likely to approve of. Feel free to make improvements to the “User search” use case as well. (20 pts.)

User search

Created By:	John Nelson	Last Updated By:	Andrew Moreno
Date Created:	March 17, 2021	Date Last Updated:	April 5, 2021
Roles:	Alumni, Graduating Students		
Description:	User searches for other users		
Preconditions:	User is authenticated.		
Postconditions:	Search results are displayed to the user.		
Normal Flow:	<p>1.0 Search for a profile</p> <ol style="list-style-type: none"> 1. User indicates desire to search for a profile. 2. A search interface appears for user to enter a keyword or use search filters. <ol style="list-style-type: none"> i. User chooses to search with a keyword and enters a keyword. ii. User chooses to search with filter options. iii. User chooses one or more filter options of choice from listed filters. <ol style="list-style-type: none"> a. Name b. Major c. Graduation Year d. City e. Company f. State g. Country 3. User submits entered keyword or choice of filters. 4. If success a list of search results with profile information and picture appears. 5. User navigates on desired profile from the search result list and opens profile details. <p>User may add the profile to their list.</p>		
Alternative Flows:	<p>1.0 User Aborts Search (branch at step 2)</p> <ol style="list-style-type: none"> 1. User indicates a desire to abort the profile search. 2. System terminates the request. 		

Exceptions:	<p>1.0.E.1 Internal error (branch after step 2)</p> <p>1. The system is not able to connect to the database or some other internal error.</p> <p>1.1. E.1 Search returns no results (branch after step 4)</p> <p>1. User submits a search input</p> <p>2. No values are returned, system displays a no result message, and user is returned to the search interface.</p>
Includes/Extends:	None
Priority:	High
Frequency of Use:	Frequent
Business Rules:	None
Special Requirements:	None
Assumptions:	None
Notes and Issues:	None

Sample answer:

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	<p>4. If success a list of search results with profile information and picture appears.</p> <p>5. User navigates on desired profile from the search result list and opens profile details.</p> <p>User may add the profile to their list.</p>
Alternative Flows:	<p>1.0 User Aborts Search (branch at step 2)</p> <p>1. User indicates a desire to abort the profile search.</p> <p>2. System terminates the request.</p> <p>1.0 User Pins Chosen Profile (branch after step 5)</p> <p>1. User pins the chosen profile.</p> <p>2. System indicates that this profile has been pinned.</p>
Exceptions:	<p>1.0.E.1 Internal error (branch after step 2)</p> <p>1. The system is not able to connect to the database or some other internal error.</p> <p>1.1. E.1 Search returns no results (branch after step 4)</p> <p>1. User submits a search input</p> <p>2. No values are returned, system displays a no result message, and user is returned to the search interface.</p>
Includes/Extends:	None
Priority:	High
Frequency of Use:	Frequent
Business Rules:	None
Special Requirements:	None
Assumptions:	None
Notes and Issues:	None

Alternatively, a new use case could be written with “extends” the existing use case.

13. Create a functional requirement / functional requirements to support both the search and pin user functionality specified in the previous question. (15 pts.)

The system shall allow users to search for profiles, using a filter to limit the results.

Rational: Users may want to view the profiles of other users.

Priority: Critical

The system shall allow users to “pin” a profile which has been found via a search or in some other manor. Once a profile has been “pinned” the system will provide a method for the user to return to that profile, without needing to perform a new search.

Rational: Users may want to return to certain profiles more than once, and they should not be required to search for the profile each time.

Priority: Low

The system shall allow users to “unpin” a profile which has previously been pinned by the user.

Rational: Users may decide that they no longer need easy access to a profile.

Priority: Low

The system should not allow a user to have multiple “pins” on the same profile. The system should allow a profile to be pinned, unpinned and repined, however.

Rational: The meaning of a multiply pinned profile would be no different than a singly pinned profile, so allowing this occurrence may be confusing to the user.

Priority: Low

The system should not allow a user to “pin” their own profile.

Rational: The system should make it easy for users to view their own profiles, making “pinning” their own profiles unneeded.

Priority: Low

14. Using the template provided, give the portion of a data dictionary for the *Tech Connect* data required in the search and “pin contact” functionality that you described in the previous two questions. While this data may include references to data in the *GIT Webservice*, assume that this data would not be stored in the *GIT Webservice*.
(15 pts.)

Data Element	Description	Composition or Data type	Length	Values
<i>First Name</i>	<i>A user’s primary first name in the system which will be displayed as part of the ‘pin</i>	<i>String</i>	<i>C32</i>	<i>alphabetic</i>
<i>Last Name</i>	<i>A user’s primary last name in the system which will be displayed as part of the ‘pin</i>	<i>String</i>	<i>C32</i>	<i>alphabetic</i>
<i>Profile ID</i>	<i>A unique profile id to be displayed, in case two pinned users have the same first and last names</i>	<i>Integer</i>	<i>4 bytes</i>	<i>numeric</i>
<i>Pinned list</i>	<i>For each user/profile in the system a, possibly empty, list of “pinned” users</i>	<i>Composition of a profile ID and a list of Profile IDs.</i>		<i>User a has pins to users c, d and e</i>