

REQUIREMENTS DERIVATION

PROBLEMS

A. Derive at least two sub-requirements from the following requirement:

1. When an account is locked, the system shall allow the user to follow instructions to unlock the account.

B. Fix the following requirements derivation:

1. The Accounts Screen shall show the account name, account number, account balance, and interest rate, if applicable.
 - a. The Accounts Screen shall show only the last four digits of account numbers.
 - i. The Accounts Screen shall show the fourth to last digit of the account number.
 - ii. The Accounts Screen shall show the third to last digit of the account number.
 - iii. The Accounts Screen shall show the second to last digit of the account number.
 - iv. The Accounts Screen shall show the last digit of the account number.

C. Derive at least five sub-requirements from the following requirements:

1. The system shall record the IP address(es) associated with a user.
2. The system shall automatically fill in the username when the IP address is associated with a user.
3. The system shall provide the option to automatically fill in the password when the IP address is associated with a user.
4. By default, the system shall not automatically fill in the password when the IP address is associated with a user.
5. The system shall allow the user to change the option to automatically fill in the password for the IP address(es) associated with the user.
6. When the user attempts to log in with an incorrect username, the system shall indicate that the username is incorrect, and the system shall not check the password field.

D. Identify which of the following requirements, if any, do not support the parent requirement:

1. The system shall be able to send a “Forgot username” email with a user’s username.
 - a. When a user attempts to log in with an incorrect username, the system shall redirect to the “Forgot username” page.
 - b. The system shall indicate in the subject line and body of the email that the email is a “Forgot username” email.
 - c. The system shall include the user’s username in the body of the email.
 - d. The system shall include message to disregard the email if it was sent in error in the body of the email.
 - e. The system shall include a link to the login page in the body of the email.

**E. Derive at least ten sub-requirements for the Authentication System
(Challenge: Derive at least twenty sub-requirements):**

1. The system shall record the IP address(es) associated with a user.
2. The system shall automatically fill in the username when the IP address is associated with a user.
3. The system shall provide the option to automatically fill in the password when the IP address is associated with a user.
4. By default, the system shall not automatically fill in the password when the IP address is associated with a user.
5. The system shall allow the user to change the option to automatically fill in the password for the IP address(es) associated with the user.
6. When the user attempts to log in with an incorrect username, the system shall indicate that the username is incorrect, and the system shall not check the password field.
7. When the user attempts to log in with an incorrect password, the system shall indicate that the password is incorrect.
8. When the user attempts to log in with an incorrect username twice, the system shall provide a "Forgot username" option.
9. The system shall be able to send a "Forgot username" email with a user's username.
10. When the user enters an incorrect password twice, the system shall provide a "Forgot password" option.
11. The system shall be able to send a "Forgot password" email to allow a user to reset his or her password.
12. The system shall provide a reset password page to allow a user to reset his or her password.
13. When a user enters an incorrect password more times than the allotted limit, the system shall lock the account.
14. When an account is locked, the system shall allow the user to follow instructions to unlock the account.

SOLUTIONS

NOTE: Plain red text is an insertion, red text with a strikethrough is a deletion, and italicized text indicates a comment.

A. Derive at least two sub-requirements from the following requirement:

1. When an account is locked, the system shall allow the user to follow instructions to unlock the account.
 - a. The system shall provide a support center phone number for the user to use to unlock the account.
 - b. The system shall allow a locked account to be unlocked by a system administrator at a user's request.
 - c. If the user created security questions, then the system shall allow the user to answer a security question to unlock the account.
 - i. When the user selects the option to answer a security question, the system shall randomly select a security question.
 - ii. When the user correctly answers a security question, the system shall unlock the account.

(additional answers possible)

B. Fix the following requirements derivation:

2. The Accounts Screen shall show the account name, account number, account balance, and interest rate, if applicable.
 - a. The Accounts Screen shall show only the last four digits of account numbers.
 - i. ~~The Accounts Screen shall show the fourth to last digit of the account number.~~
 - ii. ~~The Accounts Screen shall show the third to last digit of the account number.~~
 - iii. ~~The Accounts Screen shall show the second to last digit of the account number.~~
 - iv. ~~The Accounts Screen shall show the last digit of the account number.~~

(third-level derivation is excessive)

C. Derive at least five sub-requirements from the following requirements:

1. The system shall record the IP address(es) associated with a user.
 - a. The system shall track and store the IP address(es) associated with a user using a database.
2. The system shall automatically fill in the username when the IP address is associated with a user.
3. The system shall provide the option to automatically fill in the password when the IP address is associated with a user.
 - a. The system shall record the user's preference in the boolean savePassword property
 - b. The system shall set the savePassword property to true when the user selects the option to automatically fill in the password.
4. By default, the system shall not automatically fill in the password when the IP address is associated with a user.
 - a. By default, the system shall set the savePassword property to false.
5. The system shall allow the user to change the option to automatically fill in the password for the IP address(es) associated with the user.
 - a. The system shall set the savePassword property to the value selected by the user.
6. When the user attempts to log in with an incorrect username, the system shall indicate that the username is incorrect, and the system shall not check the password field.

(additional answers possible)

D. Identify which of the following requirements, if any, do not support the parent requirement:

1. When a user attempts to log in with an incorrect username, the system shall redirect to the “Forgot username” page.
2. The system shall be able to send a “Forgot username” email with a user’s username.
 - a. ~~When a user attempts to log in with an incorrect username, the system shall redirect to the “Forgot username” page.~~
 - b. The system shall indicate in the subject line and body of the email that the email is a “Forgot username” email.
 - c. The system shall include the user’s username in the body of the email.
 - d. The system shall include message to disregard the email if it was sent in error in the body of the email.
 - e. The system shall include a link to the login page in the body of the email.

(derived requirement does not support top-level requirement)

E. Derive at least ten sub-requirements for the Authentication System (Challenge: Derive at least twenty sub-requirements):

1. The system shall record the IP address(es) associated with a user.
 - a. The system shall track and store the IP address(es) associated with a user using a database.
2. The system shall automatically fill in the username when the IP address is associated with a user.
3. The system shall provide the option to automatically fill in the password when the IP address is associated with a user.
 - a. The system shall record the user's preference in the boolean savePassword property
 - b. The system shall set the savePassword property to true when the user selects the option to automatically fill in the password.
4. By default, the system shall not automatically fill in the password when the IP address is associated with a user.
 - a. By default, the system shall set the savePassword property to false.
5. The system shall allow the user to change the option to automatically fill in the password for the IP address(es) associated with the user.
 - a. The system shall set the savePassword property to the value selected by the user.
6. When the user attempts to log in with an incorrect username, the system shall indicate that the username is incorrect, and the system shall not check the password field.
7. When the user attempts to log in with an incorrect password, the system shall indicate that the password is incorrect.
8. When the user attempts to log in with an incorrect username twice, the system shall provide a "Forgot username" option.
 - a. The system shall prompt the user for the email address used to set up the account.
 - b. The system shall check the database for the email address entered by the user.
 - c. When the system cannot find the specified email address in the database, the system shall report to the user that the specified email address was not found.
 - d. When the system cannot find the specified email address in the database, the system shall allow the user to re-enter the email address.
 - e. When the system finds the specified email address in the database, the system shall send a "Forgot username" email to the specified email address.

9. The system shall be able to send a “Forgot username” email with a user’s username.
 - a. The system shall indicate in the subject line and body of the email that the email is a “Forgot username” email.
 - b. The system shall include the user’s username in the body of the email.
 - c. The system shall include message to disregard the email if it was sent in error in the body of the email.
 - d. The system shall include a link to the login page in the body of the email.
10. When the user enters an incorrect password twice, the system shall provide a “Forgot password” option.
 - a. The system shall prompt the user for the email address used to set up the account.
 - b. The system shall check the database for the email address entered by the user.
 - c. When the system cannot find the specified email address in the database, the system shall report to the user that the specified email address was not found.
 - d. When the system cannot find the specified email address in the database, the system shall allow the user to re-enter the email address.
 - e. When the system finds the specified email address in the database, the system shall send a “Forgot password” email to the specified email address.
11. The system shall be able to send a “Forgot password” email to allow a user to reset his or her password.
 - a. The system shall indicate in the subject line and body of the email that the email is a “Forgot password” email.
 - b. The system shall include a link to a reset password page in the body of the email.
 - c. The system shall include message to disregard the email if it was sent in error in the body of the email.
12. The system shall provide a reset password page to allow a user to reset his or her password.
 - a. The system shall allow a user to enter a new password.
 - b. The system shall require the user to enter the new password twice.
 - c. The system shall require the reset password page to expire when one hour has passed since the “Forgot password” email was sent.
 - d. The system shall require the reset password page to expire when the password has been reset.

- e. The system shall handle user attempts to access an expired reset password page.
 - i. When a user attempts to access an expired reset password page, the system shall indicate to the user that the page has expired.
 - ii. When a user attempts to access an expired reset password page, the system shall direct the user to return to the “Forgot password” option to resend the reset email.
 - iii. When a user attempts to access an expired reset password page, the system shall provide a link to the “Forgot password” option.
13. When a user enters an incorrect password more times than the allotted limit, the system shall lock the account.
- a. By default, the system shall set an allotted limit of five incorrect password entries per hour.
 - b. By default, the system shall set an allotted limit of ten incorrect password entries per 24-hour day.
 - c. The system shall allow accounts to be locked.
 - i. The system shall consider a locked account to be an account in which the user is prevented from logging in without unlocking the account.
 - d. When an account is locked, the system shall indicate that it is locked when the user attempts to log in.
14. When an account is locked, the system shall allow the user to follow instructions to unlock the account.
- a. The system shall provide a support center phone number for the user to use to unlock the account.
 - b. The system shall allow a locked account to be unlocked by a system administrator at a user’s request.
 - c. If the user created security questions, then the system shall allow the user to answer a security question to unlock the account.
 - i. When the user selects the option to answer a security question, the system shall randomly select a security question.
 - ii. When the user correctly answers a security question, the system shall unlock the account.

(additional answers possible)