

Module # 3 Login/Registration

Boundary Value Analysis (BVA) for Login/Registration Validations in Metabase Application:

Input Field	Minimum	Minimum +1	Average	Maximum	Maximum +1
Username	7 characters	6 characters	160 characters	319 characters	320 characters
Password	13 characters	12 characters	64 characters	127 characters	128 characters

Username Valid (Yes/No)	Username Empty (Yes/No)	Username Incorrect (Yes/No)	Password Valid (Yes/No)	Password Empty (Yes/No)	Password Incorrect (Yes/No)	Account Locked (Yes/No)	Action
Yes	No	No	Yes	No	No	No	Proceed to Home Page
No	Yes	No	No	No	No	No	Display "Username is required"
No	No	Yes	Yes	No	No	No	Display "Invalid Username"
Yes	No	No	No	No	Yes	No	Display "Invalid Password"
No	Yes	No	No	No	No	No	Display "Password is required"
No	No	Yes	Yes	No	No	No	Display "Invalid Username"
No	No	No	No	No	No	Yes	Display "Account is locked"

Risk Analysis Table for Login/Registration Validations in Metabase Application:

Risk	Description	Probability	Severity	Action to Minimize
Weak Passwords	Users choosing weak or easily guessable passwords can lead to security vulnerabilities.	Moderate	High	1- Password Complexity Requirements: Enforce password complexity requirements, including minimum length, special characters, and a combination of upper and lower case letters. 2- User Education: Educate users on the importance of strong passwords and provide guidance on creating secure passwords.
Account Lockout Due to Multiple Failed Attempts	Locking user accounts after multiple failed login attempts can frustrate users and lead to potential denial-of-service attacks.	Low	High	Locking user accounts after multiple failed login attempts can frustrate users and lead to potential denial-of-service attacks.
Forgotten Password Recovery	Forgotten Password Recovery	Moderate	Moderate	1- Password Reset Options: Offer multiple options for password recovery, such as security questions, email verification, or SMS verification. 2- Account Recovery Process: Implement a secure and user-friendly account

Risk	Description	Probability	Severity	Action to Minimize
Credential Theft	Unauthorized users gaining access to valid login credentials can result in data breaches and misuse of user accounts.	Low	High	1- Secure Transmission: Implement secure communication protocols (e.g., HTTPS) to protect login credentials during transmission. 2- Multi-Factor Authentication (MFA): Encourage users to enable MFA for an added layer of security
Cookie Management	Poorly managed session cookies can lead to security vulnerabilities and unauthorized access to user accounts.	Moderate	High	1- Secure Cookie Handling: Implement secure cookie management practices, including secure, http-only, and same-site flags. 2- Session Timeout: Enforce session timeouts to automatically log users out after a period of inactivity.

Coverage Analysis per Feature (GUI)

- **Login with Incorrect Username:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with Incorrect Password:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with Empty Fields:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with a Locked Account:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with a Non-existent Username:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with an Empty Username:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with an Empty Password:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%

- **Login Using a Password Manager:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Successful Login with Valid Username and Password:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Successful Login with Password Reset Link:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Successful Login with API Token:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **Login with Expired Password Reset Link:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%

Coverage Analysis per Feature (GUI)

- **API Test for Login with Incorrect Username:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login with Incorrect Password:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login with Empty Fields:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login with a Locked Account:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%

- **API Test for Login with a Non-existent Username:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login with an Empty Username:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login with an Empty Password:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login Using a Password Manager:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Successful Login with Valid Username and Password:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Successful Login with Two-Factor Authentication:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Successful Login with Password Reset Link:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Successful Login with API Token:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%
- **API Test for Login with Expired Password Reset Link:**
 - Risk Coverage: 53.8%
 - Decision Table Coverage: 100%
 - BVA Coverage: 66.67%

Module Defect Summary

Measures of Login Page Module (GUI):

- Number of Decision Tables: 13
- Number of Boundary Value Analysis (BVA) Test Cases: 12
- Number of Positive Test Cases: 10
- Number of Negative Test Cases: 3
- Number of Passed Test Cases: 6
- Number of Failed Test Cases: 7

Defect Density for Login Page Module (API):

- Defect Density: 53.8%

Coverage Analysis for Login Page Module (API):

- Risk Coverage: 53.8%
- Decision Table Coverage: 78%
- BVA Coverage: 66.67%