Password Manager

Intro

Team Organization

Software Requirements

Software Design

Test Overview

Traceability Matrix

Software Demonstration

Reflection

Members:

Andrew, Cameron, Jagger, Montana, Tristen, Carson, Miguel, Dakota, Chhavi, Sai

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Software Demonstration
Reflection

Team Organization

Team Organization

Followed the **Agile methodology** to enable iterative development. We utilized sprints to meet at least once a week to keep us on track.

Tools Used:

- Wt Framework: Web application development.
- **SQLite:** Secure data storage.
- **OpenBSD:** Hosting for high security.

Training:

- Basics of the Wt framework.
- Writing secure SQL queries.
- Web application security practices.
- Version Control

Sub-Teams

 Model Team - Jagger, Carson, Cameron, Chavi, Andrew

Carson

- 2) <u>View Team</u> Jagger, Montana, Miguel, Sai, Cameron, Carson, Chavi, Tristen
- 3) <u>Database Team</u> Andrew, Dakota, Tristen, Cameron, Sai
- 4) <u>Test Team</u> Dakota, Miguel, Tristen, Montana, Carson
- 5) Merge Team Andrew, Cameron, Jagger

Software Requirements

Miguel, Sai

Osername:

Account

Password:

Purpose

The **Shared Password Manager System** helps users simplify password management by securely storing and organizing their credentials in one convenient place, allowing easy access whenever needed.

Key Objectives:

- Admin Control: Admin users manage user accounts and roles.
- Role-Based Features: Users have distinct permissions based on their roles, ensuring secure and efficient access.
- **Focus on Security**: Implements encryption and secure access protocols to protect sensitive data.

Software Requirements

Store user credentials securely with role-based access.

Functional requirements:

1. Privilege Separation

- Admin can manage users.
- Regular users can view, add, and edit credentials.
- View-only users can only view credentials.

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Non-Functional Requirements:

2. Security Measures

- Daily backups and minimal database access privileges for data protection.
- Implemented AES encryption for all data transfers and password storage.

3. Performance

- System uptime goal of 99.99%.
- Maximum 2-second response time.
- Manages multiple user actions simultaneously

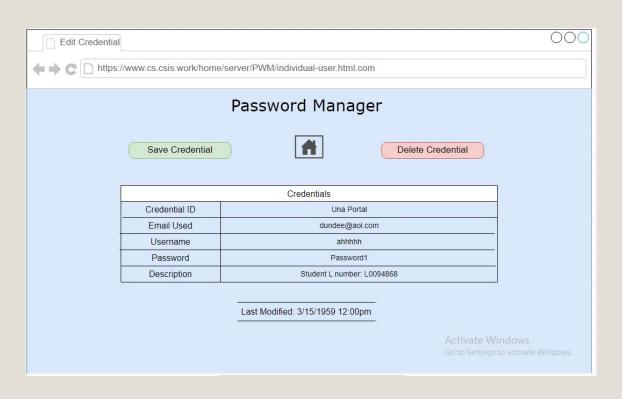


| Password Manager | Add Credential | Edit Credential | Q Search Credential | Manage Users | Logout |
|------------------|----------------|-----------------|------------------------|--------------|--------|
| | Creder | ntials | | | |
| Last | Modified | ID Nar | ne | | |
| 10/22 | /24 5:00pm | Google D | rive | | |
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
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Dakota, carson

Dakota, carson

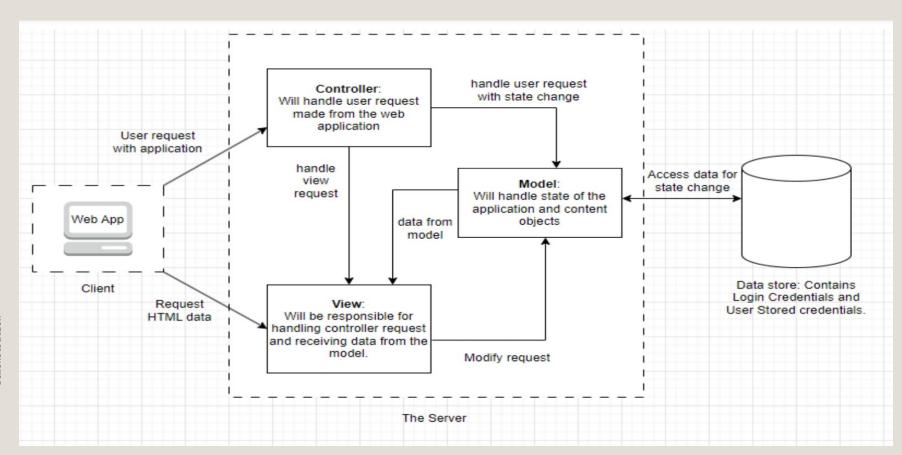


Software Design

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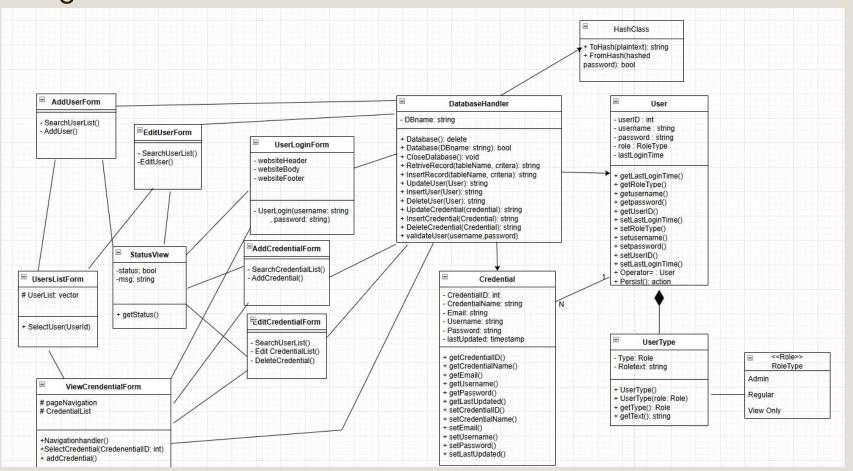
Jagger

MVC ARCHITECTURE DIAGRAM



Del

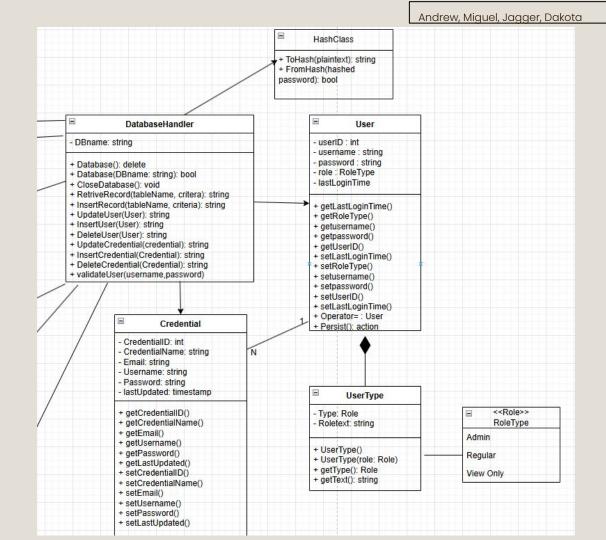
Design Overview:



Jagger, Andrew, Montana

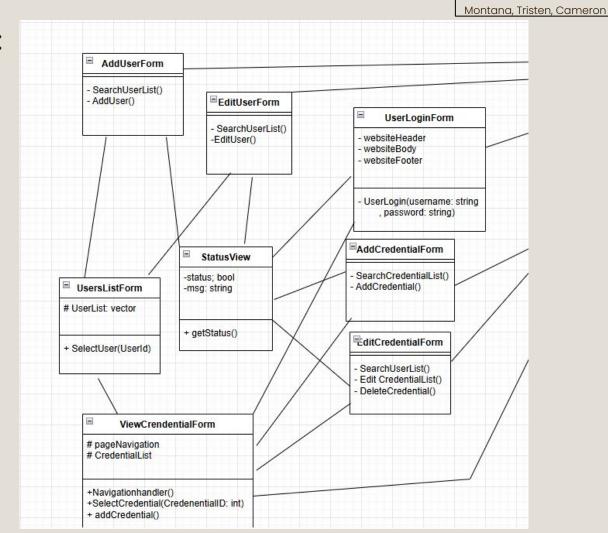
Model Breakdown:

- How it works?
- ModelControl
- Design decisions



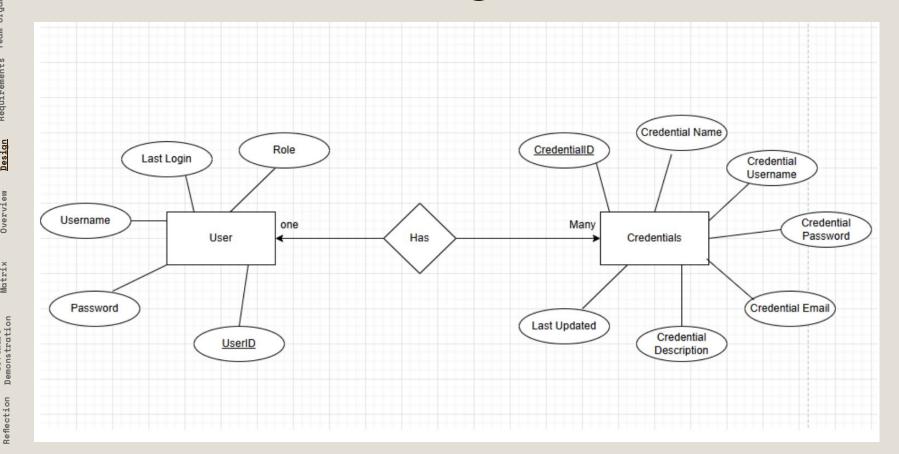
View Breakdown:

- How it works?
- App driver
- Cs



E/R Diagram

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Test Overview

Model Unit Test Results

All unit tests were conducted with gtest

| User Class Tests | Constructor And Getters | M1 | This test shall test the Constructors and the Getter functions of the User Class | Pass |
|----------------------------|----------------------------|----|--|------|
| | Update Last Login | M2 | This test shall test the UpdateLastLogin function of the User Class | Pass |
| | Operator | М3 | This test shall test the overloaded operator of the User Class | Pass |
| UserType Class Tests | Constructor And Getters | M4 | This test shall test the Constructors and the Getter functions of the UserType Class | Pass |

Model Unit Test Results

| Credential Class | Constructor And Getters | M5 | This test shall test the Constructor and Getter functions of the Credential Class | Pass |
|------------------|----------------------------|-----|---|------|
| Tests | Update Last Updated | M6 | This test shall test the UpdateLastUpdated function of the Credential Class | Pass |
| | Setters | M7 | This test shall test the Setter functions of the Credential Class | Pass |
| Database | Constructor | M8 | This test shall test the Constructor for the Database | Pass |
| Tests | Insert Record | M9 | This test shall test the InsertRecord function for the Database | Pass |
| | Retrieve Record | M10 | This test shall test the RetrieveRecord function for the Database | Pass |
| | Update Record | M11 | This test shall test the UpdateRecord function for the Database | Pass |
| | Delete Record | M12 | This test shall test the DeleteRecord function for the Database | Pass |

Produce

Different Hashes

Model Unit Test Results

| | Hash Class Tests | To Hash Returns Correct Hash | M13 | This test shall test the ToHash function of the HashClass | Pass |
|--|------------------------|---|-----|---|------|
| | | From Hash Validates Correctly | | This test shall test the FromHash function of the HashClass, for a correct password entry | Pass |
| | | From Hash Fails On Incorrect Password | M15 | This test shall test the FromHash function of the HashClass, for an incorrect password entry | Pass |
| | | To Hash Different Passwords | M16 | This test shall test the ToHash function of the HashClass, ensuring each password receives a unique hash. | Pass |

|raceability | Matrix

View Unit Test Results

| | addCredView Features | Tester ~ | Viewer - | What the code does | Expected output | Actual Ouput 🔻 | Pass/Fail |
|------|--|----------|-------------|----------------------------------|-------------------|------------------|-----------|
| 10 | | | | Click and type in the fields and | | You can click | |
| / Ö. | addCred Fields(ID,username,password,email, | | | displays specific field | You can click and | and type in the | |
| | Crediential Name, description) | Dakota | Sai, Carson | (ID, username, and password) | type in the field | field | Р |
| | Add button | Dakota | Sai, Carson | The add button is clickable | clickable button | clickable button | Р |
| V9. | Cancel button | Dakota | Sai, Carson | The cancel button is clickable | clickable button | clickable button | Р |

| | SearchCredential Features | Tester | Viewer V | What the code does | Expected output | Actual Ouput | Pass/Fail ▼ |
|--------------|---|--------|-------------------|--|---------------------------------------|--------------------------------|-------------|
| /10. | SearchCredential Fields(ID,username,password,email, | | Carson,Da | Click on SearchCredential and displays all fields involved for | Display all of the fields and let you | Fields are displayed and le | t |
| | Crediential Name) | Sai | kota | searching a credential | type in them | you type in them | |
| /11 . | Search button | Sai | Carson, Dakota | The search button is clickable | clickable button | clickable button | Р |
| /12 | Cancel button | Sai | Carson, Dakota | The cancel button is clickable | clickable button | clickable button | Р |

View Unit Test Results

| | SearchUser Features 🔻 | ▼ Tester ▼ | Viewer 💌 | What the code does | Expected output | Actual Ouput | Pass/Fail 🕶 |
|------|---|------------|-------------|---|--|---|-------------|
| | SearchUser Fields(ID,username,password,userType) | Carson | Dakota, Sai | Click on SearchUser and displays all fields involved for searching a i user | Display all of the fields and let you type in them | Fields are displayed and let you type in them | |
| | Search button | Carson | Dakota, Sai | i The search button is clickable | clickable button | clickable button | P |
| ′16. | Cancel button | Carson | Dakota, Sai | The cancel button is clickable | clickable button | clickable button | P |

| | EditCredView Features | ▼ Tester ▼ | Viewer | What the code does | Expected output | Actual Ouput * | Pass/Fail |
|------|--|------------|--------|--|-------------------|------------------|-----------|
| V17. | | | 20 | Click and type in the fields and displays specific field | | You can click | 37-3 |
| | EditCredFields(ID,username,password,email, | | | (ID, username, password, email, | You can click and | and type in the | |
| | Crediential Name, description) | Dakota | Carson | Crediential Name, description) | type in the field | field | P |
| V18. | Edit button | Dakota | Carson | The edit button is clickable | clickable button | clickable button | P |
| V19. | Cancel button | Dakota | Carson | The cancel button is clickable | clickable button | clickable button | P |
| V20. | Delete button | Dakota | Carson | The delete button is clickable | clickable button | clickable button | P |

View Unit Test Results

| addUserView Feature | ▼ Tester ▼ | Viewer ~ | What the code does | Expected output | Actual Ouput | Pass/Fai |
|--------------------------------------|------------|-------------|-----------------------------------|--------------------|------------------|----------|
| | | | | | | |
| Cancel button | Carson | Sai, Dakota | The cancel button is clickable | clickable button | clickable button | Р |
| | | | | | | |
| Add button | Carson | Sai, Dakota | The add button is clickable | clickable button | clickable button | Р |
| | | | | | clickable | |
| | | | clicking the dropdown arrow | clickable dropdown | dropdown that | |
| | | | displays the following clickable | that displays user | displays user | |
| Drop down fields (user type) | Carson | Sai, Dakota | fields: Admin, regular, view-only | type options | type options | P |
| | | | Click and type in the fields and | | You can click | |
| | | | displays specific field | You can click and | and type in the | |
| addUser fields: ID,Username,Password | Carson | Sai, Dakota | (ID, username, and password) | type in the field | field | Р |

Integration Test Results

IT 1.

IT 2.

| Integration: Login Screen 🔻 1 | rester v | Viewer ~ | What the code does | Expected output | Actual Ouput | Pass/Fail |
|--|----------|----------------|--|---|------------------------|-----------|
| ogin screen with username | | Sai, Carson | Enter the username and password for your account and get signed in. Be sent to the home screen | Sign in successful | Sign in was successful | P |
| Login screen with username and password that are incorrect | Dakota | Sai, Carson | Enter the username and password for your account and get signed in. Be sent to the home screen | Error message saying you can't be signed in | Invalid Login | Р |

IT 3.

| Integration: Log Out | Tester | Viewer | What the code does | Expected output | Actual Ouput | Pass/Fail |
|--|--------|--------|---|---------------------------|---------------------------|-----------|
| 24-2-14-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1- | | | | You can click the button | Button clicks and you get | |
| | | Sai, | Clicking the logout button logs you out and | and get taken back to the | taken back to the login | |
| Log out button | Dakota | Carson | takes you back to the login page | login screen | screen | P |

Integration Test Results

What the code does

IT 1.

IT 2.

IT 3.

IT 4.

IT 5.

IT 6.

IT 7.

Integration: addUser

| | | 111 | 111 | Dropdown menu displays | The state of the s | |
|--------------------------|--------|--------|--|--------------------------|--|---|
| User Type | | | | and lets you choose one | Drop down menu | |
| Dropdown(Options: Admin, | | Sai, | Clicking on the dropdown menu for the | of the following: Admin, | displays all three roles, | |
| Regular, Viewer) | Carson | Dakota | userType displays all three fields | Regular, View-Only | and lets you choose one | P |
| Add Button (checks that | | | | Clicking add button will | | |
| triggers addNewUser | | Sai, | Add button will add the user and info from the | place the user and their | Add button does not | |
| method) | Carson | Dakota | fields (id, username, etc.) to the database | info into the database | work | P |
| Add Button (checks that | | | | Clicking add button will | | |
| triggers addNewUser | | Sai, | Add button will add the user and info from the | place the user and their | Add button does not | |
| method) | Carson | Dakota | fields (id, username, etc.) to the database | info into the database | work | Р |
| Add Button (checks that | | | | Clicking add button will | | |
| triggers addNewUser | | Sai, | Add button will add the user and info from the | place the user and their | Add button does not | |
| method) | Carson | Dakota | fields (id, username, etc.) to the database | info into the database | work | Р |

Actual Ouput

Expected output

| Integration: addCredential | Tester ~ | Viewer ~ | What the code does | Expected output | Actual Ouput | Pass/Fail v |
|----------------------------|----------|-------------|---|---|--|-------------|
| Add button | Dakota | Sai, Carson | Clicking on the add button should add the info for the new credential to the database | New credential is added to the database | The add button does not work | Р |
| Cancel Button | Dakota | Sai,Carson | Clicking on the cancel button should not save the current credential being added and should send the user back to the home screen | Does not save the current credential and send the user back to the home screen | Does not save the current credential and sends the user back to the home screen | Р |
| Add button | Dakota | Sai,Carson | Clicking on the add button should add the info for the new credential to the database | New credential is added to the database | The add button does not work | P |

IT 11.

IT 12.

Dakota, Carson, Sai Integration Test Results

| | Integration: SearchUser | · Tester · | Viewer ~ | What the code does | Expected output | Actual Ouput | Pass/Fail ~ |
|-----------------|---|------------|----------|--|---------------------------|--------------------------|-------------|
| | WILL TO THE PARTY OF THE PARTY | | | | | Lets you enter info into | |
| IT 8. | | | | | | the fields and returns | |
| 11 0. | | | | Clicking on the search button should check the | Returns no matches if | "No matches: (" if there | |
| | | | Dakota, | credential that is already added in the database | that user isn't in the | are no users matching | |
| | Search button | Carson | Sai | and if not it returns no matches | database | the info you put in | P |
| | | | | | Does not search the | | |
| ı 0 | | | | | current credential in the | It doesnot search the | |
| IT 9. | | | | Clicking on the cancel button does not search | database and send the | credential entered and | |
| | | | Dakota, | the credential in the database and should send | user back to the home | take you back to the | |
| | Cancel Button | Carson | Sai | the user back to the home screen | screen | home screen | P |
| | | | IN THE | Clicking on the search button should check the | Returns ID, username, | Returns ID, username, | |
| IT 10 | | | Dakota, | credential that is already added in the database | password, user type, and | password, user type, and | |
| 11 10. | Search button | Carson | Sai | and if not it returns no matches | last login | last login | P |

| | Integration: SearchCred | Tester > | Viewer | What the code does ~ | Expected output | Actual Ouput | Pass/Fail v |
|---|-------------------------|----------|---------|--|------------------------------|------------------------|-------------|
| | | | | Clicking on the search button should check the | It returns the credential of | The Search button does | |
| · | | | Carson, | credential that is already added in the database | the specific user if it is | work and returns no | |
| | Search button | Sai | Dakota | and if not it returns no matches | found in the database | matches | P |
| | | | | | Does not search the | | - |
| | | | | | current credential in the | It doesnot search the | |
|) | | | | Clicking on the cancel button does not search | database and send the | credential entered and | |
| | | | Carson, | the credential in the database and should send | user back to the home | take you back to the | |
| | Cancel Button | Sai | Dakota | the user back to the home screen | screen | home screen | P |

Integration Test Results

| | Integration: EditUser | ∨ Tester ∨ | Viewer ~ | What the code does | Expected output | Actual Ouput | Pass/Fail v |
|--------|-----------------------|------------|----------|--|--|--|-------------|
| IT 13. | | | | When edit button is clicked it saves changes | Displays "successfully edited" and saves your | Displays "successfully edited" and saves your | |
| | Edit button | Carson | Dakota | that you enter into the fields to the database | changes | changes | P |
| IT 14. | Cancel button | Carson | Dakota | When the cancel button is clicked it should take you back to the home screen | Taken back to the home screen | Taken back to the home screen | P |
| IT 15 | Delete button | Carson | Dakota | | Displays "successfully deleted" and deletes the credential | Displays "successfully deleted" and deletes the credential | P , |

| | Integration: EditCred | Tester ~ | Viewer ~ | What the code does | Expected output | | Pass/Fail v |
|--------|-----------------------|----------|----------|--|--------------------------|--------------------------|-------------|
| | | | | | Displays "successfully | Displays "successfully | |
| IT 16. | | | | When edit button is clicked it saves changes | edited" and saves your | edited" and saves your | |
| | Edit button | Dakota | Carson | that you enter into the fields to the database | changes | changes | P |
| | | | 1 | When the cancel button is clicked it should take | Taken back to the home | Taken back to the home | |
| IT 17. | Cancel button | Dakota | Carson | you back to the home screen | screen | screen | P |
| | | 1111 | | The second secon | Displays "successfully | Displays "successfully | |
| IT 18. | | | | When you click the delete button with the ID it | deleted" and deletes the | deleted" and deletes the | |
| | Delete button | Dakota | Carson | should delete the credential from the database | credential | credential | P |

Traceability Matrix

Traceability Matrix

Chhavi, Andrew

| | Design Component | Requirement Description | Test Case # |
|-----------------------------|-----------------------|---|-------------|
| Performance Requirements | System Architecture | The software shall support 10 users while maintaining a maximum response time of 2 seconds. | n/a |
| | User Interface | The software shall exhibit response times of between 0 and 2 seconds after user input. | n/a |
| | Server Infrastructure | Unplanned extended downtime shall not exceed 1 minute each week. | n/a |
| | Authentication Module | The software shall support a minimum of two users altering credentials at the same time. | n/a |

| ro O | Traceability | | | Chhavi, Andrew |
|---------------------------|--------------------------|----------------------------|--|--------------------|
| tion Int | Matrix | Design Component | Requirement Description | Test Case # |
| Team Organizatio | Security Requirements | Encryption Module | Admin passwords shall not be obtainable by any user but that specific admin. | n/a |
| ware ements | | Access Control | Data log access shall only be available to Admin users. | n/a (but, true) |
| Software Requirements | | Encryption Module | All data transfers containing user data shall be encrypted. | n/a (but, true) |
| Software Design | | Session Manager | Sessions shall expire after an inactivity of 30 minutes. | n/a |
| Test Overview | | Compliance Module | The software shall enforce password authentication requirements following the NIST Digital Identity Guidelines (SP 800-63B). | M13, M14, M15, M16 |
| Traceability Matrix | | Authentication Module | Accounts shall lock after three repeated failed login attempts. | n/a |
| | | Database Security | For any database login, a minimum of AES encryption shall be used before authentication. | M13, M14, M15, M16 |
| Software Demonstration | | Backup System | The software shall prevent data loss of user credentials by completing daily backups of all files to a secondary location. | n/a |
| efection | | Database Access Control | All interactions with the database shall access the database with the least privilege possible for the least amount of time. | M9, M10, M11, M12 |

IT 1-18

Components shall allow the ability to update without affecting other parts of the

system.

M 1-16 V 1-21

Documentation

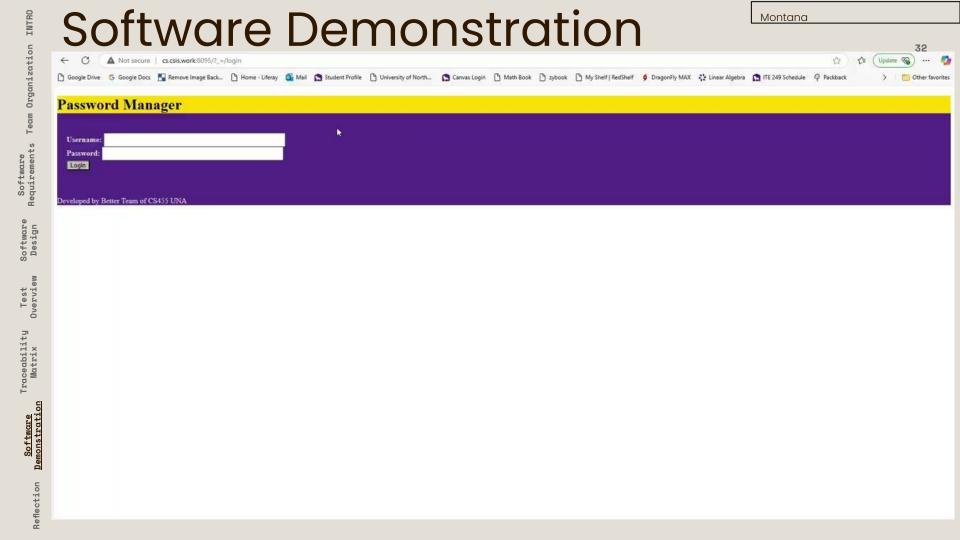
Modular Design

Software shall be n/a (but, true) accompanied by documentation.

Security Framework

The software shall protect against unauthorized access and data breaches.

n/a (not, true...)



everyone

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Reflection

- 1. Model unit testing allowed us to fix and isolate problems.
- 2. SDD and SRS are important to spend less time on deciding how the app should behave (we forgot some design screens)
- 3. Would have benefitted from being trained on wt, sql interfacing.