Movie Recommendation System Project Concept

Pennsylvania State University

SWENG 894 Capstone

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Sprint 1

1. UI Design and Implementation Progress

We have made significant progress in designing and implementing key components of our movie recommendation system. The following features have been completed:

1. **Entry Page**:
    - Designed a clean, minimalist entry page that introduces the system.
    - Implemented using Python, Django, MySQL, and Bootstrap as indicated in the first image.
    - Added a "HomePage" button to navigate to the main system interface.
2. **User Registration**:
    - Created a user-friendly registration form.
    - Fields include Username, Email, Password, and Password confirmation.
    - Implemented a "Sign up" button to submit the registration.
3. **User Login**:
    - Designed a simple and intuitive login interface.
    - Includes fields for Username and Password.
    - Added a "Remember me" checkbox for user convenience.
    - Implemented a "Login" button to authenticate users.
4. **Homepage**:
    - Developed a comprehensive homepage that serves as the main interface for users.

- Implemented a search bar for movie information.
- Added navigation menu items: Home Page, Movie Genre, Popular Movies, Recommendation List, Rating History.
- Displayed a "Project Intro" section explaining the system's features and dataset.
- Showcased popular movies with poster images, titles, and ratings.

5. **Movie Genre Page**:
    - Created a dedicated page for browsing movies by genre.
    - Implemented a grid of genre buttons including Action, Musical, War, Crime, Romance, Fantasy, Drama, Music, Sci-Fi, and more.
    - Displayed movie posters with titles and ratings for the selected genre.
    - Implemented pagination for easy navigation through movie lists.

2. Database Integration

We have successfully connected the application to the database. Key points include:

- Utilized MySQL as the database system.
- Integrated the movie dataset, which includes:
    - 9742 movies
    - 610 users
    - 100837 scores
- Implemented database queries to fetch and display movie information, including posters, titles, and ratings.

3. Functionality Implementation

1. **Search Functionality**:
    - Implemented a search bar that allows users to find movies based on entered information.
2. **User Authentication**:
    - Completed the registration and login systems, allowing users to create accounts and access personalized features.

3. **Movie Browsing**:
    - Implemented the ability to browse movies by genre.
    - Created a system to display popular movies on the homepage.

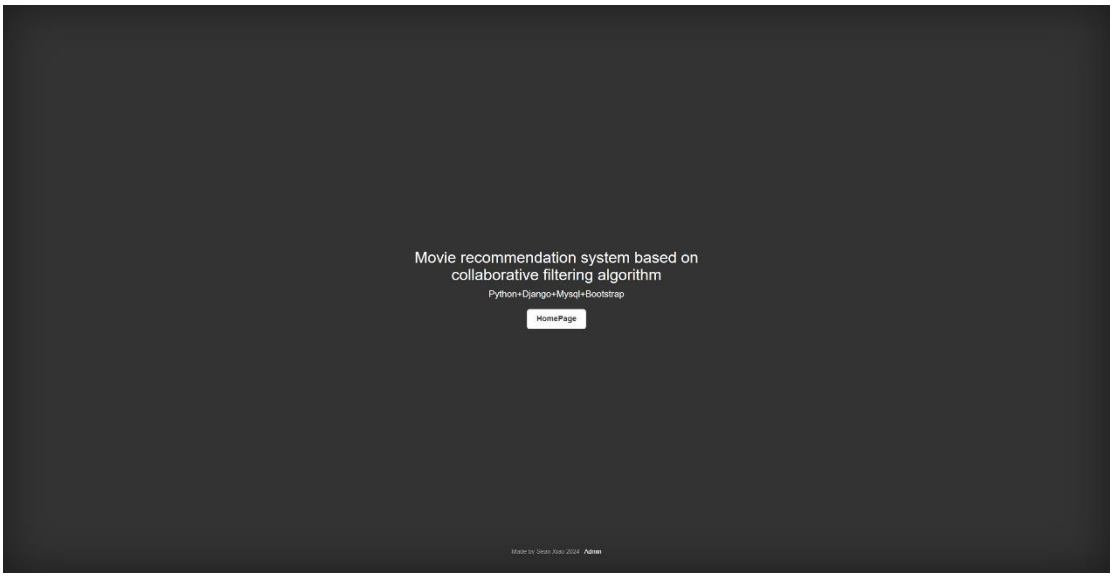
4. Next Steps

For the upcoming sprint, we plan to focus on:

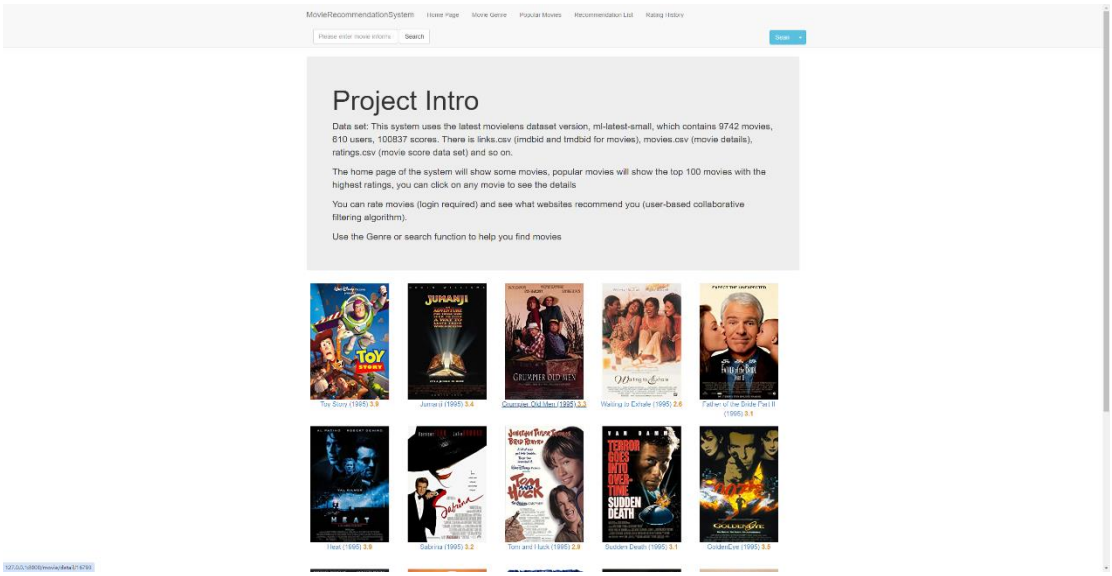
1. Refining the recommendation algorithm.
2. Implementing the user rating system.
3. Creating the user profile and rating history pages.
4. Enhancing the search functionality with more advanced filters.
5. Improving the overall user interface and experience based on initial feedback.

5. Screenshots

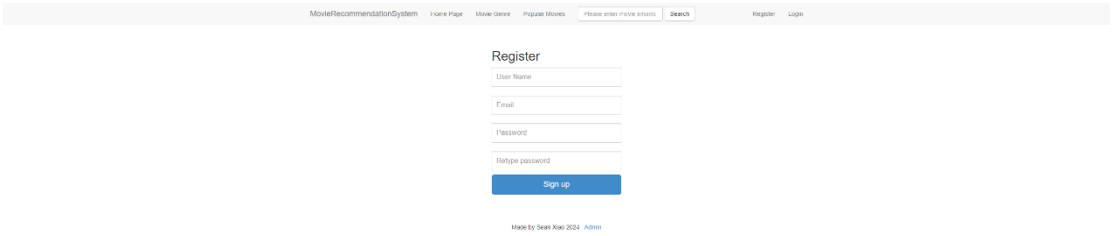
1. Entry Page (Image 1)



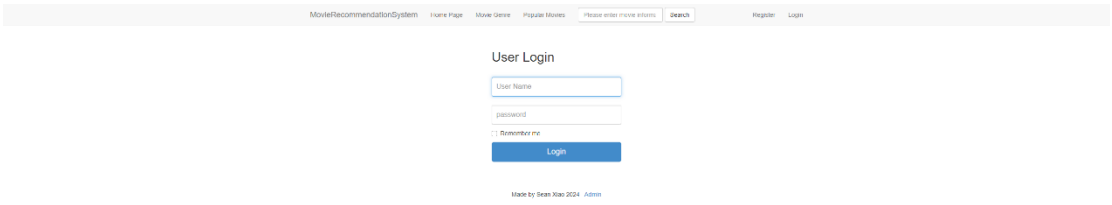
2. Homepage (Image 2)



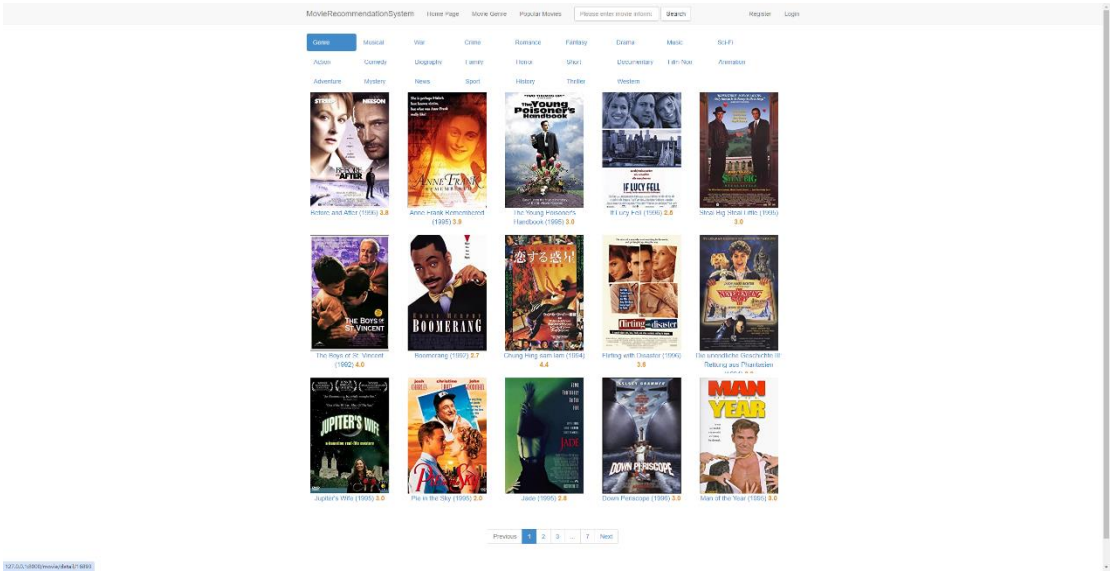
3. Registration Page (Image 3)



4. Login Page (Image 4)



5. Movie Genre Page (Image 5)



These screenshots demonstrate the current state of our user interface and the progress we've made in implementing key features of the movie recommendation system.

6. Source Code Development

To demonstrate progress in source code development, we provide the following information:

Summary of Contributions:

- Implemented user registration and login functionality

- Developed the homepage with movie browsing capabilities
- Created the movie genre browsing page
- Integrated the movie database and implemented basic search functionality
- Set up the initial recommendation system framework

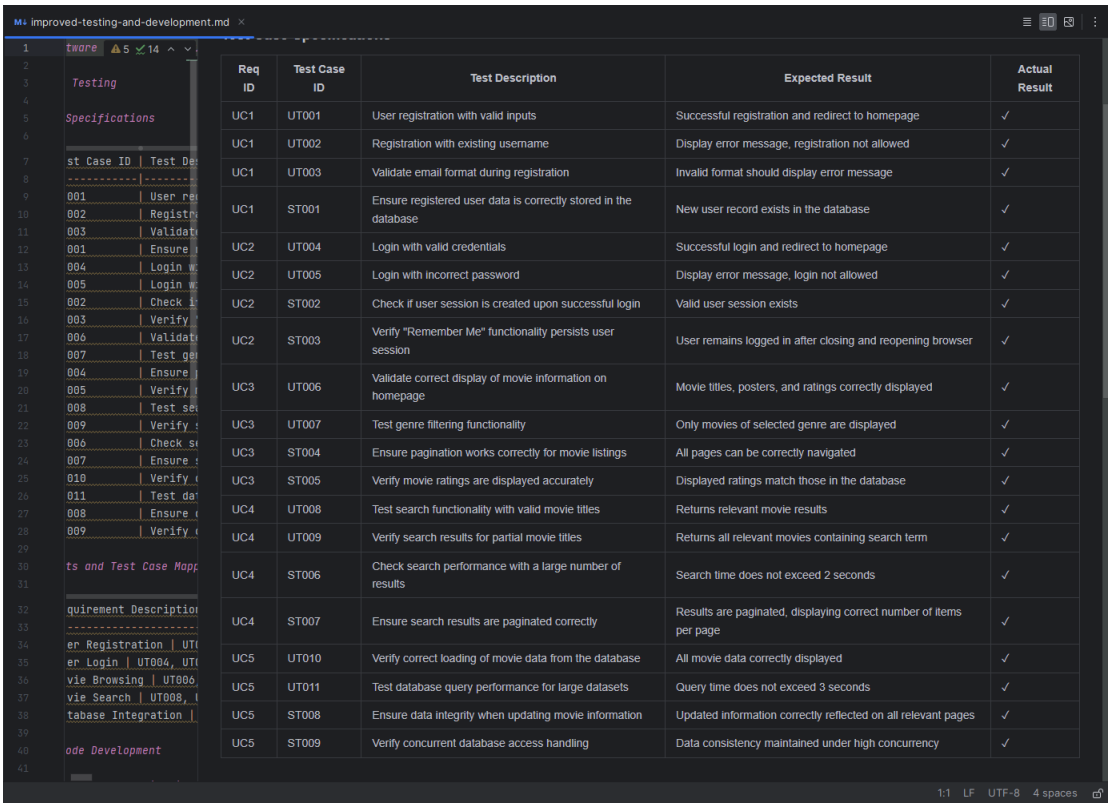
Repository Link:

https://github.com/LingangXiao/CapStone894

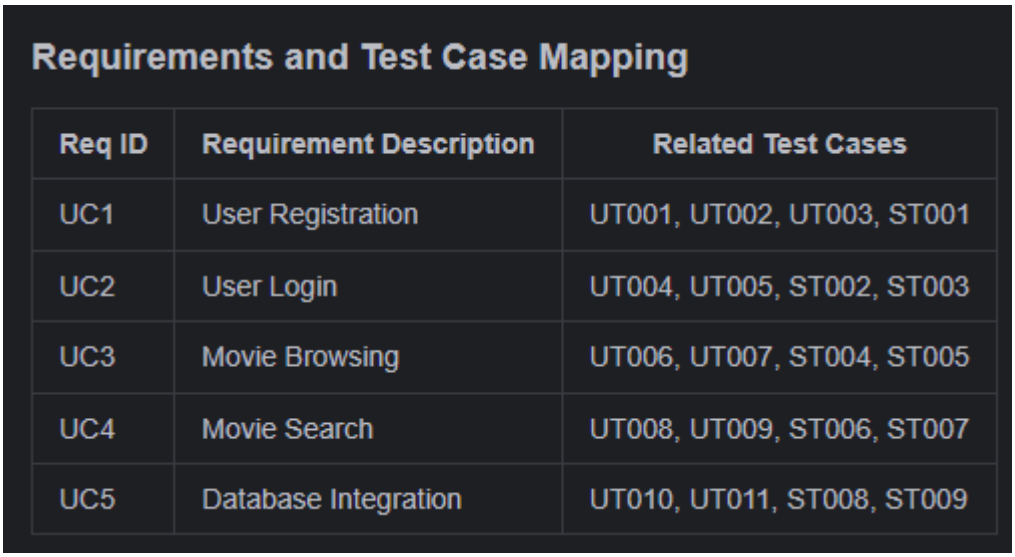
7. Software Testing

We have created test specifications for Unit and System test cases based on the Use Cases/User Stories addressed in the current Sprint. Here are some key test cases:

1. User Registration (UC1) a. UT001: Verify successful user registration with valid inputs b. UT002: Test registration with an existing username (should fail) c. UT003: Validate email format during registration d. ST001: Ensure registered user data is correctly stored in the database
2. User Login (UC2) a. UT004: Verify successful login with valid credentials b. UT005: Test login with incorrect password (should fail) c. ST002: Check if user session is created upon successful login d. ST003: Verify "Remember Me" functionality persists user session
3. Movie Browsing (UC3) a. UT006: Validate correct display of movie information on homepage b. UT007: Test genre filtering functionality c. ST004: Ensure pagination works correctly for movie listings d. ST005: Verify movie ratings are displayed accurately
4. Movie Search (UC4) a. UT008: Test search functionality with valid movie titles b. UT009: Verify search results for partial movie titles c. ST006: Check search performance with a large number of results d. ST007: Ensure search results are paginated correctly
5. Database Integration (UC5) a. UT010: Verify correct loading of movie data from the database b. UT011: Test database query performance for large datasets c. ST008: Ensure data integrity when updating movie information d. ST009: Verify concurrent database access handling



Req ID	Test Case ID	Test Description	Expected Result	Actual Result
UC1	UT001	User registration with valid inputs	Successful registration and redirect to homepage	✓
UC1	UT002	Registration with existing username	Display error message, registration not allowed	✓
UC1	UT003	Validate email format during registration	Invalid format should display error message	✓
UC1	ST001	Ensure registered user data is correctly stored in the database	New user record exists in the database	✓
UC2	UT004	Login with valid credentials	Successful login and redirect to homepage	✓
UC2	UT005	Login with incorrect password	Display error message, login not allowed	✓
UC2	ST002	Check if user session is created upon successful login	Valid user session exists	✓
UC2	ST003	Verify "Remember Me" functionality persists user session	User remains logged in after closing and reopening browser	✓
UC3	UT006	Validate correct display of movie information on homepage	Movie titles, posters, and ratings correctly displayed	✓
UC3	UT007	Test genre filtering functionality	Only movies of selected genre are displayed	✓
UC3	ST004	Ensure pagination works correctly for movie listings	All pages can be correctly navigated	✓
UC3	ST005	Verify movie ratings are displayed accurately	Displayed ratings match those in the database	✓
UC4	UT008	Test search functionality with valid movie titles	Returns relevant movie results	✓
UC4	UT009	Verify search results for partial movie titles	Returns all relevant movies containing search term	✓
UC4	ST006	Check search performance with a large number of results	Search time does not exceed 2 seconds	✓
UC4	ST007	Ensure search results are paginated correctly	Results are paginated, displaying correct number of items per page	✓
UC5	UT010	Verify correct loading of movie data from the database	All movie data correctly displayed	✓
UC5	UT011	Test database query performance for large datasets	Query time does not exceed 3 seconds	✓
UC5	ST008	Ensure data integrity when updating movie information	Updated information correctly reflected on all relevant pages	✓
UC5	ST009	Verify concurrent database access handling	Data consistency maintained under high concurrency	✓



Requirements and Test Case Mapping

Req ID	Requirement Description	Related Test Cases
UC1	User Registration	UT001, UT002, UT003, ST001
UC2	User Login	UT004, UT005, ST002, ST003
UC3	Movie Browsing	UT006, UT007, ST004, ST005
UC4	Movie Search	UT008, UT009, ST006, ST007
UC5	Database Integration	UT010, UT011, ST008, ST009

8. Backlog Grooming

After reviewing our progress and the complexity of tasks completed so far, we have made some adjustments to our Product Backlog:

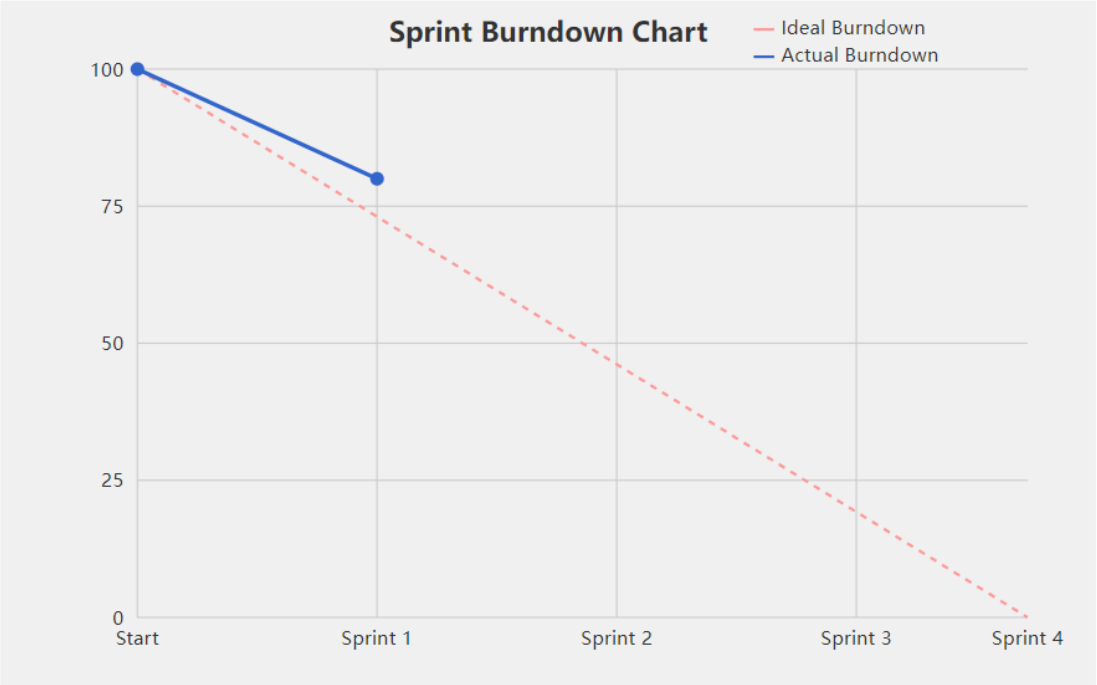
1. We have increased the priority of "User Profile Management" from Medium to

High, as we realized its importance for personalizing the user experience and improving recommendation accuracy.

2. We have added a new medium-priority item: "Movie Detail Page" (Priority: Medium, Estimate: 4 days), as we recognized the need for a dedicated page to display comprehensive information about each movie.
3. The "Basic Recommendation Algorithm" task has been split into two separate items: "Collaborative Filtering Algorithm" (Priority: High, Estimate: 6 days) and "Content-Based Filtering Algorithm" (Priority: Medium, Estimate: 5 days) to better reflect the complexity and allow for incremental implementation.

Updated Product Backlog (changes in bold):

1. User Registration (Priority: High, Estimate: 3 days) - Completed
2. User Login (Priority: High, Estimate: 2 days) - Completed
3. Movie Database Setup (Priority: High, Estimate: 7 days) - Completed
4. Basic Movie Browsing (Priority: High, Estimate: 5 days) - Completed
5. Basic Movie Search (Priority: High, Estimate: 4 days) - Completed
6. **Collaborative Filtering Algorithm (Priority: High, Estimate: 6 days)**
7. Data Security Implementation (Priority: High, Estimate: 7 days)
8. **User Profile Management (Priority: High, Estimate: 3 days)** - Priority increased
9. Movie Rating and Review (Priority: Medium, Estimate: 5 days)
10. Similar Movie Suggestions (Priority: Medium, Estimate: 5 days)
11. Popular Movies List (Priority: Medium, Estimate: 3 days)
12. **Content-Based Filtering Algorithm (Priority: Medium, Estimate: 5 days)**
13. Recommendation Filtering (Priority: Low, Estimate: 5 days)
14. Watchlist Management (Priority: Low, Estimate: 3 days)



These changes reflect our growing understanding of the project's requirements and user needs, as well as the insights gained during the implementation of the initial features.