TU856/3
SOFTWARE TESTING

ASSIGNMENT 1 - SYSTEM REQUIREMENTS

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1. Introduction

This document outlines the functional and non-functional requirements for the TunePal music library and streaming service. The system enables users to:

- Create accounts and log in.
- Access a shared song library and manage private collections.
- Search for songs by title, artist, and release year.
- Purchase premium songs via an in-app shop.
- Manage playlists and song downloads.
- Handle song playback efficiently with pagination.

Each requirement is clearly defined, testable, and aligned with business needs.

2. Functional Requirements & Test Cases

Each requirement is accompanied by corresponding test cases, expected results, test objects, and test bases to ensure proper validation.

Requirement ID	Requirement	Test Steps	Expected Result	Test Object	Test Basis
FR001	Users must be able to create an account and log in using email and password.	1. Navigate to Sign-Up page. 2. Enter valid credentials. 3. Click "Sign Up". 4. Attempt login with the same credentials.	User successfully registered and logged in.	Authentication System	Business Requirements
FR002	Users must have access to a shared library and add personal songs.	1. Open library. 2. Search shared songs. 3. Upload a private song. 4. Verify song appears in "My Library".	Songs appear correctly in shared and private library.	Music Library	UI & Backend Specifications
FR003	The library must be searchable by artist, title, and year, including special characters.	1. Open search bar. 2. Enter artist name/title/year. 3. Include special characters (&, %, $). 4. Click search.	Search returns relevant songs while correctly handling special characters.	Search Module	System Requirements

FR004	Users can log in on up to two devices simultaneously.	1. Log in on Device 1. 2. Log in on Device 2. 3. Attempt login on Device 3.	Third login is denied.	Authentication System	Security Policies
FR005	Songs must download within 5 seconds.	1. Select song. 2. Click download. 3. Measure time.	Download completes ≤5 seconds.	Download Manager	Performance Requirements
FR006	Users can access a shop to buy premium songs.	1. Open shop. 2. Add item to basket. 3. Proceed to checkout.	Purchase completes successfully.	Payment System	Business Requirements
FR007	Users can empty their shopping basket.	1. Open basket. 2. Click "Empty Basket". 3. Verify basket is empty.	Basket is cleared successfully.	Basket Module	UI Requirements
FR008	Users must receive an order confirmation email after purchase.	1. Complete a purchase. 2. Check email inbox.	Confirmation email is received.	Email Notification System	Business Requirements
FR009	Users should be able to recover a forgotten password.	1. Click "Forgot Password". 2. Enter registered email. 3. Receive reset link. 4. Reset password successfully.	Password reset is successful.	Authentication System	Security Policies
FR010	Users should be able to manage and edit their playlists.	1. Create a playlist. 2. Add, remove, and reorder songs. 3. Save changes.	Playlist updates correctly.	Playlist Management	UI & Backend Specifications
FR011	The system should support pagination for large song libraries.	1. Load song list. 2. Navigate to next page. 3. Navigate to previous page.	Song list is paginated correctly.	Pagination System	System Requirements
FR012	The system should handle invalid inputs gracefully.	1. Enter invalid year for search. 2. Enter negative page size.	System shows appropriate error message and does not crash.	Input Validation System	Security Requirements

3. Non-Functional Requirements & Validation

These non-functional requirements ensure that TunePal meets performance, security, and usability standards.

Requirement ID	Requirement	Validation Method
NFR001	The app must be responsive across mobile, tablet, and desktop.	UI testing across different devices.
NFR002	Login system must use password encryption.	Code review & security test.
NFR003	The system must support 10,000+ concurrent users.	Load testing with JMeter.
NFR004	All payments must be PCI-DSS compliant.	Compliance audit.
NFR005	User data must be backed up daily.	Backup verification
NFR006	Songs must stream without buffering under normal network conditions.	Performance testing.
NFR007	API responses should complete within $\leq$ 200ms for standard queries.	Performance testing.
NFR008	The system should be available 99.9% of the time (high availability).	Uptime monitoring.
NFR009	The UI should be accessible to users with disabilities (WCAG 2.1 compliance).	Accessibility testing.
NFR010	The system must log security events such as failed logins and unauthorized access attempts.	Security audit.

4. Edge Cases & Additional Considerations

This section outlines potential system challenges and ensures proper handling.

Scenario	Handling Approach
Invalid Login Attempts	System locks users out after 5 failed login attempts within 10 minutes.
Special Characters in Search	Ensure search correctly handles special characters (`&, %, $`).
Duplicate Song Uploads	System prevents duplicate songs from being uploaded to a private library.
Network Failures	Purchases & downloads resume after reconnection to avoid data loss.

5. Conclusion

This document outlines the system requirements for TunePal, ensuring that both functional and non-functional requirements are testable. The corresponding test cases, test objects, and test bases are clearly identified for each requirement, making it easier to develop test scripts and ensure that all aspects of the system are validated before release.

By following this structured approach, we ensure that TunePal meets its functional, performance, and security needs, providing users with a seamless, reliable, and secure music streaming experience.