Functional Requirements

# User Management

* **FR-001: User Registration** - The system shall allow new users to create accounts by providing email, username, and password with email verification
* **FR-002: User Authentication** - The system shall authenticate users through secure login using username/email and password
* **FR-003: Profile Management** - Authenticated users shall be able to view, edit, and update their profile information including personal details and preferences

# Dataset Management

* **FR-004: Dataset Upload** - Authenticated users shall be able to upload datasets in multiple formats (CSV, JSON, XML, etc.) with metadata including title, description, tags, and category
* **FR-005: Dataset Download** - Authenticated users shall be able to download available datasets with appropriate format preservation
* **FR-006: Dataset Access Control** - The system shall enforce appropriate permissions for dataset access based on user roles and dataset visibility settings

# Discovery and Search

* **FR-007: Dataset Search** - Users shall be able to search datasets using keywords, tags, categories, and metadata filters
* **FR-008: Advanced Search** - The system shall provide advanced search capabilities including date ranges, file types, and user-specific filters
* **FR-009: Dataset Recommendations** - The system shall recommend related datasets to users based on their search history, downloads, and dataset similarity algorithms

# Analytics and Trending

* **FR-010: Trending Datasets** - The system shall display trending datasets based on download frequency, user ratings, and recent activity
* **FR-011: Trending Topics** - The system shall identify and display trending topics and categories based on dataset uploads and user engagement

Non-Functional Requirements

# Performance Requirements

* **NFR-001: Dataset Retrieval Performance** - The system shall retrieve and display dataset search results within 3 seconds for 95% of queries
* **NFR-002: Download Performance** - Dataset downloads shall initiate within 5 seconds and maintain consistent transfer speeds
* **NFR-003: Upload Performance** - The system shall support concurrent dataset uploads with progress indicators

# Usability Requirements

* **NFR-004: User Training Time** - New users shall be able to perform basic operations (search, download, upload) within 30 minutes of first use
* **NFR-005: Intuitive Interface** - The system shall provide an intuitive user interface following modern UX/UI design principles
* **NFR-006: Accessibility** - The platform shall comply with WCAG 2.1 AA accessibility standards

# Scalability Requirements

* **NFR-007: User Scalability** - The system shall support up to 100,000 concurrent users without performance degradation
* **NFR-008: Data Scalability** - The platform shall handle storage and retrieval of up to 10TB of dataset files
* **NFR-009: Horizontal Scaling** - The system architecture shall support horizontal scaling through load balancing and distributed storage

# Security Requirements

* **NFR-010: Data Encryption** - All user data and datasets shall be encrypted using AES-256 encryption both at rest and in transit
* **NFR-011: Authentication Security** - The system shall implement secure authentication using industry-standard protocols (OAuth 2.0, JWT tokens)
* **NFR-012: Data Privacy** - The system shall comply with GDPR and other relevant data protection regulations

# Reliability Requirements

* **NFR-013: System Availability** - The system shall maintain 99.9% uptime, allowing for no more than 8.76 hours of downtime per year
* **NFR-014: Data Backup** - The system shall perform automated daily backups with point-in-time recovery capabilities
* **NFR-015: Error Handling** - The system shall provide graceful error handling with informative user feedback and automatic recovery where possible

# Compatibility Requirements

* **NFR-016: Browser Compatibility** - The platform shall be compatible with modern web browsers (Chrome, Firefox, Safari, Edge) within the last 2 major versions
* **NFR-017: Mobile Responsiveness** - The system shall provide a responsive design that works effectively on desktop, tablet, and mobile devices
* **NFR-018: API Compatibility** - The system shall provide RESTful APIs with versioning for third-party integrations

User Stories or Use Cases

end-user interactions with the system