Project Folder Structure

Model Classes and Fields

User

- userId
- name
- email
- password
- createdAt

Issue

- issueId
- title
- description
- status
- priority
- createdBy
- assignedTo
- createdAt
- updatedAt

IssueHistory

- historyId
- issueId
- action
- oldValue
- newValue
- performedBy
- performedAt

Enum Classes

IssueStatus

- OPEN
- IN_PROGRESS
- RESOLVED
- CLOSED

Prority

- Low
- Medium
- High
- Critical

DAO Interfaces and Methods

UserDAO

- saveUser
- findById
- findByEmail
- getAllUsers
- deleteUser

IssueDAO

- createIssue
- findIssueById
- getIssuesByUser
- getAllIssues
- updateIssue
- deleteIssue

IssueHistoryDAO

- addHistory
- getHistoryForIssue
- getAllHistory

Service Classes and Methods

UserService

- registerUser
- login
- getUserById
- listAllUsers

IssueService

- createIssue
- assignIssue
- updateStatus
- updateDescription
- updateTitle
- closeIssue
- getIssueById
- getAllIssues
- filterIssuesByStatus
- filterIssuesByUser

IssueHistoryService

- logHistory
- getHistoryForIssue
- getAllHistory

Exception Classes

UserNotFoundException
IssueNotFoundException
DatabaseException
InvalidStatusTransitionException
AuthenticationException

Utility Classes

DBConnectionUtil

- read db properties
- load driver
- provide connection

PropertiesLoader

- load property files

Validator

- validateEmail
- validatePassword
- validateIssueFields

DateTimeUtil

- getCurrentTimestamp
- format date

Config Classes

LogInitializer

- configure log4j2
- load logging properties

AppConfig

- load config.properties
- expose application-level settings

Application Entry Point

IssueTrackerApplication

- main method
- load configs
- initialize logging
- run menus

```sql
CREATE TABLE users (
    user_id BIGINT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(100) NOT NULL,
    email VARCHAR(150) NOT NULL UNIQUE,
    password VARCHAR(255) NOT NULL,
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);

CREATE TABLE issue (
    issue_id BIGINT PRIMARY KEY AUTO_INCREMENT,
    title VARCHAR(200) NOT NULL,
    description TEXT NOT NULL,
    status VARCHAR(50) NOT NULL CHECK (status IN ('OPEN', 'IN_PROGRESS', 'RESOLVED', 'CLOSED')),
    priority VARCHAR(50) NOT NULL CHECK (priority IN ('LOW', 'MEDIUM', 'HIGH', 'CRITICAL')),
    created_by BIGINT NOT NULL,
    assigned_to BIGINT,
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    updated_at TIMESTAMP NULL,
    CONSTRAINT fk_issue_created_by FOREIGN KEY (created_by) REFERENCES users(user_id),
    CONSTRAINT fk_issue_assigned_to FOREIGN KEY (assigned_to) REFERENCES users(user_id)
);

CREATE TABLE issue_history (
    history_id BIGINT PRIMARY KEY AUTO_INCREMENT,
    issue_id BIGINT NOT NULL,
    action VARCHAR(255) NOT NULL,
    old_value VARCHAR(255),
    new_value VARCHAR(255),
    performed_by BIGINT NOT NULL,
    performed_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    CONSTRAINT fk_history_issue FOREIGN KEY (issue_id) REFERENCES issue(issue_id),
    CONSTRAINT fk_history_performed_by FOREIGN KEY (performed_by) REFERENCES users(user_id)
);
```

````
User (single row)

```
+----------+-----------+-----------------------+----------+---------------------+
| userId   | name      | email                 | password | createdAt           |
+----------+-----------+-----------------------+----------+---------------------+
| 101      | John Doe  | johndoe@example.com   | ******** | 2025-11-26 10:15:42 |
+----------+-----------+-----------------------+----------+---------------------+
```

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Issue (single row)

```
+----------+-------------------------------+---------------------------------------------+-------------+----------
+----------+------------+--------------------+---------------------+
| issueId  | title                         | description                                 | status      | priority
| createdBy | assignedTo | createdAt           | updatedAt           |
+----------+-------------------------------+---------------------------------------------+-------------+----------
+----------+------------+--------------------+---------------------+
| 501      | Login page throws 500 error   | Server returns 500 when user attempts login | IN_PROGRESS | HIGH
| 101       | 102        | 2025-11-26 11:05:10 | 2025-11-26 12:30:45 |
+----------+-------------------------------+---------------------------------------------+-------------+----------
+----------+------------+--------------------+---------------------+
```

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IssueHistory (single row)

```
+------------+----------+-----------------+-----------+-----------+-------------+---------------------+
| historyId  | issueId  | action          | oldValue  | newValue  | performedBy | performedAt         |
+------------+----------+-----------------+-----------+-----------+-------------+---------------------+
| 9001       | 501      | Status Updated  | OPEN      | IN_PROGRESS | 102         | 2025-11-26 12:30:45 |
+------------+----------+-----------------+-----------+-----------+-------------+---------------------+
```
````