# Project Report: AI-Based Recommendation System Using Apache Mahout

## 1. Introduction

This project is a movie recommendation system developed using Java and Apache Mahout. It uses collaborative filtering techniques to recommend movies to users based on their previous ratings.

## 2. Objective

To build an intelligent system that can recommend relevant items (e.g., movies) to users by analyzing user preferences and behavior using collaborative filtering.

## 3. Technology Stack

- Java 8
- Apache Mahout
- Maven
- Eclipse or VS Code
- CSV File for dataset

## 4. Project Structure

The project follows a standard Maven structure:

```
- src/
  └── main/
      ├── java/
      │   └── com/example/recommender_system/
      │       └── RecommenderEngine.java
      └── resources/
          └── dataset.csv
- pom.xml
```

## 5. Dataset

The dataset file (`dataset.csv`) is placed under `src/main/resources/`. Each line contains: `userID,itemID,rating`, e.g.:
1,101,4.0
2,102,3.5

## 6. Step-by-Step Execution Guide

1. Clone or download the project.
2. Open it using Eclipse or VS Code.
3. Make sure Maven is installed and configured.
4. Build the project using `mvn clean install`.
5. Run `RecommenderEngine.java` class.
6. Output will be printed in the console.

## 7. Sample Output

Recommendations for User ID 1:
Item: 104, Score: 4.024902

## 8. Conclusion

This system demonstrates a basic yet effective approach to user-based recommendations. Apache Mahout handles similarity computations efficiently and can be extended for large datasets.

## OutPut: