DATA STRUCTURES AND ALGORITHMS LAB

TOPIC: MOVIE MANAGEMENT SYSTEM

Submitted by:

SIDDHANT ROY (9922102033)

VANISHA AGARWAL (9922102035)

ANUNAY DWIVEDI (9922102048)

Submitted to:

PROF. TWINKLE TYAGI

PROF. ADITI PRIYA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA (U.P.)

September, 2024

INTRODUCTION

Problem Statement: With the increasing availability of movies across multiple platforms, efficiently managing and retrieving movie information can be a challenge. Users often need to search for specific movies, compare ratings, and find recommendations, which requires a system capable of handling large datasets efficiently. Traditional systems may struggle with performance issues when dealing with vast collections of movies, especially when implementing advanced features like sorting, filtering, and personalized recommendations. Therefore, an optimized system using appropriate data structures and algorithms is essential to address these challenges.

The **Movie Management System** will be developed to efficiently manage a collection of movies, allowing users to perform essential tasks such as adding, searching, sorting, rating, and recommending movies. The system aims to apply core data structures and algorithms to optimize performance. The project will focus on addressing common challenges like efficient movie retrieval, rating management, and recommendation generation based on user preferences.

OBJECTIVES

1. Store and manage a collection of movies with attributes such as title, genre, release year, rating, and duration.

2. Provide users with efficient search capabilities based on various attributes like title, genre, or rating.

3. Implement sorting algorithms to allow sorting of the movie collection by rating, release date, and other attributes.

4. Allow users to rate movies and display top-rated movies in an optimized manner.

5. Implement a recommendation system to suggest movies based on user preferences.

Features

1. Add Movie: A feature to add a movie with relevant attributes like title, genre, release year, rating, and duration.

2. Search Movie: A functionality to search for movies based on title, genre, or release year.

3. Sort Movies: A system to sort the movie collection by rating, release year, or other fields.

4. Delete Movie: The ability to remove a movie from the system.

5. User Ratings: A rating system where users can rate movies, and the system will calculate and display average ratings.

6. Recommendations: A recommendation engine to suggest movies based on user preferences, genre, or top-rated films.

Technologies and Algorithms

1. Programming Language: C++

2. Data Structures:

   2.1. Hash Map for efficiently storing and retrieving movie details.

   2.2. Trie for enabling efficient searching by movie title or genre prefix.

   2.3. Array/List for storing the movie collection and applying sorting algorithms.

   2.4. Heap (Priority Queue) for managing and displaying top-rated movies.

   2.5. Graph for handling relationships in movie recommendations based on genre similarity.

3. Algorithms:

   3.1. Merge Sort / Quick Sort for sorting the movies by rating, release year, or duration.

   3.2. Binary Search for fast search operations by title or rating.

   3.3. Graph Traversal for movie recommendations.

Conclusion

Through this project, we aim to showcase the importance of selecting appropriate data structures and algorithms in building an efficient and scalable Movie Management System. Once completed, this system will serve as a practical example of applying core DSA concepts to address real-world challenges in movie data management.