Practical No-05

Modeling Data Flow Diagram & Control Flow Diagram

Project: Movie Recommendation System

🧪 Aim of the Experiment

To design and draw Data Flow Diagrams (DFD) and Control Flow Diagrams that model the data movement and control logic of a Movie Recommendation System.

📘 Introduction

A Data Flow Diagram (DFD) is used to visualize the flow of data in a system—how data is input, processed, and output. It helps in understanding how the system handles data at different levels (from high-level to detailed processing).

A Control Flow Diagram shows the logical flow and control dependencies in a system, especially in complex systems involving decision-making or multiple control paths.

For a Movie Recommendation System, DFDs will map how user data (ratings, preferences, searches) flow through various system components (UI, Recommendation Engine, Database).

✅ Objectives

After completing this practical, you will be able to:

Identify external entities (like Users and Admins) and system functionalities.

Model the flow of data through different modules of your system.

Represent the system’s structure using DFD (Context Level and Level 1).

Understand the control flow with Control Flow Diagrams.

📚 Theory

🔸 Data Flow Diagram (DFD)

A graphical tool used to describe how data flows through a system. It includes:

Processes: Operations on the data (e.g., Generate Recommendations)

Data Stores: Where data is stored (e.g., Movie Database, User Profiles)

External Entities: Actors like users or admin

Data Flows: Arrows showing data movement

🔸 Graphical Notations

Symbol Meaning

Rectangle External Entity

Circle / Oval Process

Open-ended Rectangle Data Store

Arrow Data Flow

🔸 Explanation of Symbols Used in DFD

External Entity: Source or destination of data (e.g., User, Admin)

Process: Converts incoming data into outgoing data (e.g., Rate Movie, Recommend Movie)

Data Store: Repositories where data is held (e.g., Movie DB, Watchlist DB)

Data Flow: Movement of data (e.g., user rating sent to DB)

🧩 Context Diagram (Level 0 DFD) – Movie Recommendation System

Entities:

User

Admin

Recommendation Engine

Processes:

Recommend Movies

Rate Movies

Browse Movies

Data Stores:

User Database

Movie Database

🔁 Level 1 DFD

Break down major processes:

Recommend Movie Process → Uses user history and ratings

Rate Movie Process → Updates database and user profile

Manage Movies (Admin) → Add/Delete/Update movie info

⚙ Simulation (Control Flow Diagram)

For control logic like user login and recommendation generation:

User logs in

IF new user → show popular movies

ELSE

Get watch history

Use algorithm (e.g., collaborative filtering)

Generate top 10 recommendations

Display list

User selects or skips

Log interaction to profile

🔍 Case Study Example

User: Registered User

Action: Wants recommendations

Flow:

Enters system

System retrieves user profile

Algorithm processes profile

System fetches movie metadata

Recommendation list is displayed

User interacts (clicks, rates, watches)

📖 References

Your course DFD and UML notes

"Systems Analysis and Design" by Kenneth Kendall

Lucidchart / Draw.io for diagram creation

Research papers on recommendation algorithms (for control flow logic)