University of Asia Pacific

Team B1-G3

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Project Title

The title of our project is "**Movie Recommendation System**"

Motivation

The basic idea behind this system is that movies that are more popular and critically acclaimed will have a higher probability of being liked by the average audience.For example, the type of music one would like to hear while exercising differs greatly from the type of music he'd listen to when cooking dinner. Netflix similarly recommends DVDs that may be of interest, and famously prizes to researchers who could improve the quality of their recommendations. Social networking sites like Facebook use variants on recommender.

Problem Definition

This is a web based system where there is a movie web service which provides services to users to rate movies, see recommendations, put comments and see similar movies. There are systems which deal with the self-recommendation rather than considering the likes and dislikes of users, we thereby build a system that intakes the users wishes and then recommends a watch-list of movies which is based on their selected genre. And thus makes the watch more preferable and enjoyable to the user. Given a set of users with their previous ratings for a set of movies, can we predict the rating they will assign to a movie they have not previously rated? Ex. "Which movie will you like" given that you have seen 'Harry

Potter and the Sorcerer's Stone', 'Harry Potter and the Chamber of Secrets', 'Harry Potter and the Prisoner of Azkaban' and users who
saw these movies and also liked "Harry Potter and the Goblet of Fire?"

Objective, Solution and Project Output

- Improve retention
- Caters to the user's preferences and keeps them hooked to the application.
- Increase sales
- Can improve business by a great margin by giving various recommendations of
- different items.
- Form habits
- Influencing usage patterns in users.
- Accelerate work
- Helps the analysts for further research and reduces their work.

Impact on Society:

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to

make some constructive criticism, which is welcomed, as he is the final user of the system.

Critical challenges

Based on user surveys and evaluations, recommendation systems can be characterized into two parts-

1.Content-based recommendation system

2. Collaborative filtering recommendation system

Content-based recommendation system: Content-based filtering is an approach that uses the descriptions of what users viewed or bought in the past, and then an item is recommended based on the similarities of previously used items.

Challenges in developing recommendation system:

Cold start:

This problem arises when new users or new items are added to the system, a new item can't recommend to users initially when it is introduced to the recommendation system without any rating or reviews and hence it is hard to predict the choice or interest of users which leads to less accurate recommendations.

Sparsity:

It happens many times when most of the users do not give ratings or reviews to the items they purchased and hence the rating model becomes very sparse which could lead to data sparsity problems, it decreases the possibilities of finding a set of users with similar ratings or interest.

Synonymy:

Synonymy arises when a single item is represented with two or more different names or listings of items having similar meanings; in such conditions, the recommendation system can't recognize whether the terms show various items or the same item.

Privacy:

Generally, an individual needs to feed his personal information (have an experience with hyper-personalization) to the recommendation system for more beneficial services but it causes the issues of data privacy and security, many users feel hesitation to feed their personal data into recommendation systems that suffer from data privacy issues.

Scalability:

One biggest issue is the scalability of algorithms having real-world datasets under the recommendation system, a huge changing data is generated by user-item interactions in the form of ratings and reviews and consequently, scalability is a big concern for these datasets.

Latency:

We observe many products are added more frequently to the database of recommendation systems, only already existing products are recommended to users as newly added products are not rated yet.

So an issue of Latency arises.

How Ps are addressed through the project and mapping

Ps	Attribute	How Ps are addressed through the project

P1	Depth of Knowledge Requirement	The project requires study of research on Machine Learning system mainly supervised learning model, Digital data processing **(K8)** Data collection from user sites like online movies specially movies, series, web series, documentation film etc.**(K7)** Engineering design (multi-layer model design) **(K5)** and user interface development **(K6)** knowledge of software engineering and data pre-processing (feature extension), various algorithms **(K3, K4, k2).**
P2	Range of Conflicting Requirement	Create an appropriate machine-learning model to detect a movie from similar type movies.
P3	Depth of Analysis Required	Use supervised machine learning model, a type of machine learning model instead of tensor-flow or other API based movie detection algorithm.
P4	Familiarity of Issues	Based on searching detection, choice of genre related online result, decision or movie tag.
P5	Extent of applicable codes	Using Yolov4 supervised learning model and other industrial standard library functions, build the proper solution model and user interface with data synchronization of the proposed system.
P7	Interdependence	Creating model (algorithmic part), classify data characteristic, proposed user application interface.

How As are addressed through the project

As	Attribute	How As are addressed through the project
A1	Range of Resources	In development stage, the project requires the use of diverse resources including different type of material : Movie dataset Information's: Movie meta-data, Movie knowledge Technologies: machine learning(ML) model for supervised, People: Developers. Designer, Analyzer
A2	Level of Interaction	A better interaction is required among the researchers and developers (student), Viewers and participants (system users).
A3	Innovation	A degree of innovation is required to develop the machine-learning based supervised learning model using the available data set.
A4	Consequences for society and the environment	Because of this, our viewers are going to have a more convenient platform. Even in the condition of having physical distance, people can choose their desired movie without wasting time and follow the updated trend.

A5	Familiarity	The project deals with a recommendation system based on users searching, watching, viewing rating and so on analysis of participants.

CO-PO mapping for this project

CO No.	**CO Statements**	**Corresponding POs (Appendix-1)**
CO1	Identify a real-life problem **(Recommendation System)** that can be translated to an engineering and/or computing solution through design, development and validation	12
CO2	Identify outcomes and functional requirements of the proposed solution **(Movie Recommendation System)** considering web based and/or hardware specification and standards	1,2
CO3	Identify sub components of a complex problem, prepare timeline and appropriate budget using the project management skill	11
CO4	Identify and validate the impact of environmental considerations and the sustainability of a system/subsystem of a complete project	7
CO5	Assess professional, ethical, and social impacts and responsibilities of the design project	6,8

CO6	Function effectively in a multi-disciplinary team	9
CO7	Analyze, design, build, and evaluate engineering/computing system/subsystem with given specifications and requirements	3, 4 ,5
CO8	Present design project results through oral presentations	10

Program outcomes (PO) for engineering programs

No	PO	Differentiating Characteristic
1	Engineering Knowledge	Breadth and depth of education and type of knowledge, both theoretical and practical
2	Problem Analysis	Complexity of analysis
3	Design/ development of solutions	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified
4	Investigation	Breadth and depth of investigation and experimentation
5	Modern Tool Usage	Level of understanding of the appropriateness of the tool
6	The Engineer and Society	Level of knowledge and responsibility
7	Environment and Sustainability	Type of solutions.
8	Ethics	Understanding and level of practice

9	Individual and Team work	Role in and diversity of team
10	Communication	Level of communication according to type of activities performed
11	Project Management and Finance	Level of management required for differing types of activity
12	Lifelong learning	Preparation for and depth of Continuing learning.

Project management (Time-Table) :

Lab	Working Progress
Lab 1	Introduction
Lab 2	Project Proposal Permission
Lab 3	Project Proposal Permission
Lab 4	Planning and Requirement Analysis
Lab 5	Requirement Analysis and data collecting
Lab 6	UI/Ux Planning
Lab 7	Data pre-processing
Lab 8	Data pre-processing
Lab 9	Model Building
Lab 10	Model Building
Lab 11	Model Building
Lab 12	Connect with Web
Lab 13	Deployment
Lab 14	Final Presentation and Submission