**Project: Recommender Systems (Virtual Presentation)**

Introduction:

- This project focuses on developing and implementing recommender systems, commonly used in data science.

- The project requires using Python and Jupyter Notebook to create solutions and present the results virtually.

General Requirements:

- Use Jupyter Notebook and appropriate Python libraries.

- Choose the MovieLens 1M Dataset for movie recommendation.

- Implement three tasks and create a presentation:

Task 1: User-based Collaborative Filtering

- Develop user-based collaborative filtering using KNN.

- Choose a similarity metric.

- Implement in Python, study the impact of parameter K, and use RMSE for evaluation.

- Summarize results concisely in a Word document and presentation.

Task 2: Item-based Filtering

- Develop item-based collaborative filtering using KNN.

- Choose K and compare at least two similarity metrics.

- Implement in Python, use RMSE for evaluation, and summarize results.

Task 3: A Better Recommender System

- Choose Option 1 (based on related publications) or Option 2 (propose a new algorithm) for creating a better recommender system.

- Implement in Python with detailed comments.

- Evaluate the system and compare it with Movie Average and KNN-based Collaborative Filtering using AP and NDCG metrics.

- Visualize the results and summarize findings.

Task 4: Presentation

- Create a Word document and slides. (ppt?)

- Include key results for Tasks 1, 2, and 3.

- Describe the "new" solution for Task 3.1 with proper citations.

- Include literature review if applicable.

- Provide necessary details of the algorithm.

- Present key results, visualizations, and findings for Task 3.2.

- Include a list of references.

Presentation Requirements:

- Create no more than 10 slides.

- There's no template provided.

Submission:

- Submit a Jupyter Notebook file named `assignment3.ipynb`.

- Clean the code and remove unnecessary lines.

- Ensure comments are included.

Remember to follow the guidelines closely for each task, and make sure to document your work thoroughly and present your findings clearly in your presentation.