Objective

In this assignment you will build and evaluate your own non-personalized recommender.

Instructions

1. Dataset selection
   - Choose a dataset that contains user-item feedback data.
   - You cannot use datasets explored in class during Sessions 09 and 10.
   - You may reuse a dataset from previous assignments or select a new one.
   - You can use either explicit or implicit feedback. If you build and evaluate a recommender from both types of feedback, this will be positively rewarded.

2. Model training and evaluation
   - Implement two non-personalized recommenders: random and popular.
   - Optionally, implement a default collaborative recommender as a baseline.
   - Evaluate and compare the recommenders. Correct application of evaluation methods and tools will be key to your grading.
   - Interpret and justify your results. Embed your comments and conclusions directly within the notebook for example using markdown cells. Do not create a separate report.

3. Submission
   - Use Google Colab for your analysis.
   - When finished, download the notebook (File -> Download -> Download ipynb) and upload it to the assignment portal.
   - Name the notebook file using the following format: **A4_Lastname_Firstname.iypnb**. For example: A4_Smith_John.ipynb

Grading criteria

Core implementation: Weight 50%, mandatory for passing

- Fundamental machine learning practices: Weight 25%
  - Minimum level of evaluation to demonstrate their functionality. Basic but sufficient evidence that the recommenders work as intended.
  - Correct application of tools and methods and proper use of best practices to build and evaluate recommenders.
- Interpretation and justification. Weight 20%
  - Clear, well-supported conclusions based on evaluation results.
  - Discussion of key insights, trade-offs, and practical implications.
- Code quality and organization. Weight 5%
  - Well-structured, readable, and efficient code.
  - Logical flow and clarity in the presentation of findings.

Advanced evaluation and comparison: Weight 40%

- Advanced machine learning evaluation: Weight 25%
  - Deeper analysis beyond minimal validation, consideration of all relevant evaluation perspectives covered in class.
  - Correct application of tools and methods and proper use of best practices to build and evaluate recommenders.
- Handling different feedback types: Weight 10%
  - Implementation and evaluation of non-personalized recommenders on both explicit and implicit feedback.
  - Use of appropriate evaluation metrics on the type of feedback.

- Baseline comparison: Weight 5%
    - Development of a default collaborative filtering recommender and comparative performance analysis.

Optional advanced exploration (Bonus): Weight 10%

Each completed advanced exploration adds Weight 5%, meaning by completing two of these, you can reach the full Weight 100%.

- Demographic filtering recommender: A popularity-based model that considers users metadata (requires a dataset with user attributes).
- Bayesian average popular recommender: A more sophisticated version of the popular recommender that adjusts for item uncertainty.
- Evaluation with Cross-Validation Through Time (CVTT).
- Stratified per-user evaluation: Ensures fairer assessment by stratifying evaluation at the user level.
- Other advanced topic (requires prior approval).

Final note: Turnitin only allows a single submission, resubmissions are not permitted. Make sure you upload your final version. Requests for resubmission outside the platform will result in a minor penalty for not following the designated submission format.