

Project 5: Recommendation System (Netflix/Amazon-style)

1. Description

A recommender that matches student interests and grades to suggest study programs they might not have considered (e.g., “You like biology and drawing, have you considered Landscape Architecture?”).

2. Objectives

- Build a hybrid recommender (content-based + collaborative filtering).
- Provide explanations for recommendations.
- Collect simple feedback to improve recommendations.

3. Deliverables

- Recommendation pipeline + API.
- Simple UI: interest questionnaire → recommendations.
- Evaluation notebook (NDCG, Precision@k).
- Feedback logging for retraining.

4. Weekly plan (5 weeks suggested)

- Week 1: Data modeling: user profiles, program metadata.
- Week 2: Baseline algorithms: TF-IDF content-based; matrix factorisation.
- Week 3: Hybrid model and explanation module.
- Week 4: UI and evaluation with sample users.
- Week 5 (optional): Personalisation improvements and cold-start handling.

5. Main tasks

- Build user profiles combining interests and grades.
- Build program/catalog features (tags, skills).
- Implement CF (SVD/implicit) and content-based (TF-IDF + cosine).
- Combine scores and generate human-readable explanations.
- Instrument feedback capture for offline retraining.

6. Recommended stack

Python, scikit-learn, LightFM or implicit, FastAPI, React, Docker.

7. Data & resources

- Simulated or anonymised student grades and program descriptions.

8. Evaluation criteria

- NDCG@k, Precision@k.
- Qualitative rating of explanation quality.
- User engagement metrics (click-through, acceptance).