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AIE425 Intelligent Recommender Systems, Fall Semester 25/26

Final course Project

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Submission Date: Monday, January 5, 2026

## Executive summary

The objective of this project was two-fold: first, to conduct a rigorous comparative analysis of dimensionality reduction techniques for collaborative filtering (PCA and SVD), and second, to design and implement a production-ready Hybrid Recommendation System for a Fashion Rental platform (Rent the Runway). The project addresses the core challenges of modern recommender systems: sparsity, scalability, and the cold-start problem.

### Section 1

We evaluated Principal Component Analysis (PCA) and Singular Value Decomposition (SVD) on a large-scale movie ratings dataset.

#### Dimensionality

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