Theory

Singular Value Decomposition (SVD) is a matrix factorization technique commonly used in various fields, including machine learning and signal processing. It decomposes a matrix into three constituent matrices, which can help in reducing dimensionality, compressing data, and extracting meaningful features.

**Example: Movie Recommendations on Netflix**

Let's consider a simplified scenario where we have a user-item interaction matrix representing the ratings given by users to different movies on Netflix. Each row corresponds to a user, and each column corresponds to a movie. The entries of the matrix represent the ratings given by users to movies, with missing entries indicating movies that users haven't rated.

The application of SVD in recommendation systems demonstrates how dimensionality reduction can be used to extract meaningful features and provide personalized recommendations in real-life scenarios.

Netflix recommends Movies:

<https://youtu.be/ZspR5PZemcs?feature=shared>