

## Drug Clustering and Recommender System for Drug-Drug Interactions by Using Singular Value Decomposition

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**Abstract:** Drug is a chemical substance used in the diagnosis, *treatment*, prevention of disease or to promote well-being, however when two or more different drugs are taken together, it may cause adverse in drug's effect on the body. These effects are known as Drug-Drug Interactions (DDIs) [1]. A drug-drug interaction can delay, decrease, or enhance absorption of drug so it can cause some harmful effects and in some cases maybe even fatal. Drug interactions are not just between drug and drugs, it may also be between drugs and foods or drugs and natural drugs. Some patients, may take several medicines each day. The chances of adverse drug interaction increase rapidly with the number of drugs taken [2].

Mathematics has so many applications in engineering, physics, econometrics, biology and biomedical engineering. Therefore, many real-world problems can be modeled by using mathematical tools [3]. Singular value decomposition (SVD) is a powerful tool in mathematics and has so many applications in computer science such as signal processing, recommender systems, image compressing, clustering data and reducing noises from signal and images [4].

In this paper, drugs are clustered according to Drug-Drug interactions data by using singular value decomposition. With this clustering, a recommender system can be created that help us to identify new interaction between drugs. For this recommender system, Drug-Drug Interactions information matrix is derived from [5]. In another work, drug-food interactions and drug-natural drug interactions can be used to Cluster Drugs more accurately.

**Keywords:** Drug-Drug Interactions; Drug's Effect; Singular Value Decomposition; Recommender System; Clustering Data.

### References

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