**Book Recommender System**

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**Project Description:** As a project, we will build a book recommender system. The purpose of the system will be to “guess” whether a certain user would like a particular book to recommend it to them. There is an extensive research and work done around this particular subject, and wide range of companies from streaming platforms to stores use this system. Our main goal is to learn and implement the approaches and techniques behind a tool we stumble upon so often.

**Dataset:** We have found two datasets on Kaggle, which include books (with features like the title, publisher’s name, publishing year, etc.), users, and ratings. There are also a lot of platforms for readers, like *Goodreads*, *LibraryThing,* etc., which include data about their users, like what books they have read and what ratings they gave to the books. When we research the recommender systems further, we might decide to collect data by hand, to also be able to take certain features (genres, language) that are not present in the found dataset into account.

**Approach:** In general, there are two types of recommender systems: content-based filtering and collaborative filtering. Content-Based Filtering are also known as cognitive filtering. This filtering recommends item to the user based on their past experience. Collaborative Filtering suggests relevant item to the user based on other users with similar taste. Our goal is to create a hybrid system, which will use both content-based and collaborative filtering. In the end based on these two approaches our program must predict what rating would a specific user give to book and based on that decide whether to recommend it to them or not. The dataset will be divided into train and test set. Test set will be unseen by the program during learning. When the model is created, a percentage of book ratings will be taken out of the users’ dataset and the program will need to guess the rating that was given to the book with as little error as possible. At this point, for collaborative filtering, we plan to use Matrix factorization algorithms (e.g., singular value decomposition (SVD), Alternating Least Squares (ALS) algorithm). For the content-based filtering we will use the vector space method. In the end, we will simply combine that prediction with the precision of the content-based filtering However, upon further research of hybrid systems specifically, we might find a better approach.

**References:** For now, we have the following research and articles, that we will use as a reference for our project. These include explanation of different approaches, examples of algorithms that are generally used and libraries that might be useful.

[Felfernig, Alexander & Jeran, Michael & Ninaus, Gerald & Reinfrank, Florian & Reiterer, Stefan & Stettinger, Martin. (2014). Basic Approaches in Recommendation Systems.](Felfernig,%20Alexander%20&%20Jeran,%20Michael%20&%20Ninaus,%20Gerald%20&%20Reinfrank,%20Florian%20&%20Reiterer,%20Stefan%20&%20Stettinger,%20Martin.%20(2014).%20Basic%20Approaches%20in%20Recommendation%20Systems.%2010.1007/978-3-642-45135-5__2.)

[Portugal, Ivens & Alencar, Paulo & Cowan, Donald. (2015). The Use of Machine Learning Algorithms in Recommender Systems: A Systematic Review. Expert Systems with Applications. 97.](https://www.researchgate.net/publication/284219925_The_Use_of_Machine_Learning_Algorithms_in_Recommender_Systems_A_Systematic_Review)

[Machine Learning Project – Data Science Movie Recommendation System Project in R](https://data-flair.training/blogs/data-science-r-movie-recommendation/)

[Machine Learning for Building Recommender System in Python](https://towardsdatascience.com/machine-learning-for-building-recommender-system-in-python-9e4922dd7e97)

[How to Build a Book Recommendation System](https://www.analyticsvidhya.com/blog/2021/06/build-book-recommendation-system-unsupervised-learning-project/)