# Personalized Anime Recommendations: Using Machine Learning to Suggest Your Next Favorite Show

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## Introduction

In this proposal, I will be discussing the creation of a machine learning model that recommends anime to the viewers. With the increasing popularity of anime, it can be difficult for viewers to choose the next show to watch due to an abundance of genres and animes to watch. My goal is to create a personalized recommendation system that suggests anime based on the preference of the user by utilizing machine learning algorithms, and with that, I can create a system that continuously learns and adapts to users' viewing habits. This proposal outlines the steps we will take to develop this recommendation system and the expected benefits for anime viewers.

## Dataset

To train our machine learning model, we will require a dataset of anime titles, along with their associated attributes such as genre, rating, and popularity. We will source this data from publicly available anime databases, which in our case is [MyAnimeList](https://www.kaggle.com/datasets/CooperUnion/anime-recommendations-database)’s 75000 anime dataset, obtainable from Kaggle. The dataset will be preprocessed to remove duplicates, missing values, and inconsistencies. We will also use additional features such as user ratings and genres to improve the model's accuracy in recommending anime that align with user preferences.

## Data Preparation

In this stage, we will prepare the dataset for feature engineering and modeling. This involves cleaning the data, converting categorical variables to numerical data, and normalizing the data for consistency. We will also split the data into training and testing sets to evaluate the performance of the model. Finally, we will explore the data through visualization techniques to gain insights into the relationships between the variables and identify any patterns that could inform feature engineering.

## Feature Engineering

Feature engineering is the process of selecting and transforming features to improve the performance of the machine learning model. We will create new features based on the existing data to capture additional insights that will be relevant to anime recommendations. For example, we may generate a "similarity score" between anime titles based on shared attributes, or create user-based features that capture preferences for certain genres or animation styles. These new features will be used to train the model, and evaluated for their ability to improve accuracy in recommending anime titles.

## Modelling

In this stage, we will build a machine learning model to recommend anime titles. We will explore several algorithms, including collaborative filtering, content-based filtering, and hybrid models. Collaborative filtering methods recommend anime based on users' past viewing habits, while content-based filtering methods recommend anime based on the attributes of the anime itself. Hybrid models combine both approaches to improve the accuracy of recommendations. We will evaluate the performance of each model and select the best performing one for deployment.

## Evaluation

In this final stage, we will evaluate the performance of the machine learning model using metrics such as accuracy, precision, recall, and F1-score. We will also perform A/B testing to compare the performance of the model to a baseline recommendation system. User feedback will be collected to assess the usefulness of the recommendations and identify any areas for improvement. Finally, we will discuss the limitations of the model and potential avenues for future research to enhance its performance.