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**Fachbereich:** Data Science

**Lehrveranstaltung:** SE Advanced Data Challenge

**LV-Nummer:** 405.982

SS 2020

Projektarbeit zum Thema:

**„Hit or Miss? Ein Projekt zur Vorhersage der Popularität von Liedern mithilfe von Supervised Learning“**

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**Abgabedatum:**

31.07.2020

**Wortzahl:**

xxxx

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# Abstract

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# Introduction

Our orginal idea was to use the attached *song-lyrics* dataset (songdata.csv) to perform natural language processing techniques on it and hopefully extract some interesting information. We then decided to take an extra step and tried to use the acquired knowledge from the song-lyrics towards a prediction of the overall popularity of a song. The following work will describe all the steps and methods we used to be able to accomplish this goal.

# Original Dataset

The original dataset, that we found on Kaggle, is very simplistic. It lists the title of the song along with the artist and the associated lyrics, mostly without punctuation. Additionally, it provides information about where the lyrics of the songs were retrieved from in the form of a link. The amount of songs the dataset contains amounts to 57650.

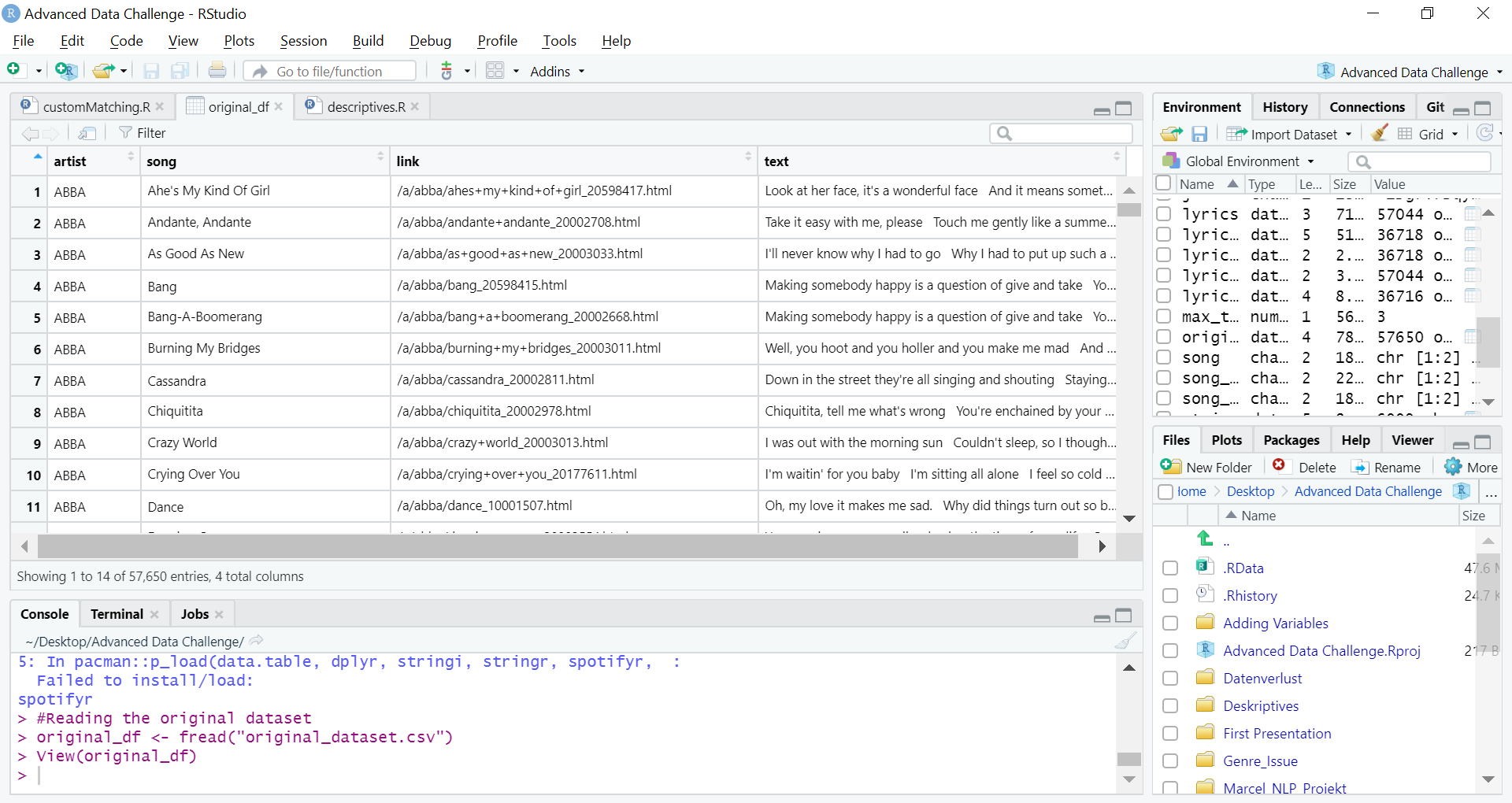


Table 1: Overview of the first few rows of the original dataset

# Spotify

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# Loss of Data

During the intent of matching the song titles from our original dataset with the songs from the Spotify data base, a lot of titles were mismatched or could not find a corresponding match at all. All in all, our original sample size of 57650 songs shrank to a final number of 36889 (about 64% of the original dataset). Some reasons for the loss of data and some problems that led to mismatching are going to be listed in the following.

The matching was performed with help of the R package *stringdist* and more specifically the function *amatch*. The integer parameter *maxDist* determines the value of how “similar” the song titles have to be in order to call them a match. The metric used to determine that similarity was the *restricted Damerau-Levenshtein distance.* What it does, in a nutshell, is counting the number of deletions, insertions and substitutions necessary to turn string b into string a.

Initially we chose the *maxDist* parameter to a fixed value of 2. That led to problems because all song titles were being treated in the same way disregarding their length. This especially led to mismatches with very short song titles, since the matching function allowed for a fixed amount of 2 differences between the strings. In one example a song named “Hope” was assigned to a song named “Home” and in another one the song title “God” was assigned to the song title “Gold”. This issue was solved by making the *maxDist* parameter dependent on the length of the song title, namely set it to a value equal to 15% (rounded down) of the amount of characters in the string.

# Genres

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# Natural Language Processing

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# Final Dataset

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# Descriptives

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# Modelling

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## Baseline Model

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## Linear Regression

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## Neural Network

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## Random Forests

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## Gradient Boosting

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## Stacked Ensemble BOF

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## Stacked Ensemble All

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# Conclusion and Future Work

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