SPRINGBOARD DATASCIENCE CAREER TRACK

RECOMMENDATION SYSTEM

FOR THE MILLION SONG DATASET

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INTRODUCTION

MOTIVATION

WHAT ARE RECOMMENDER SYSTEMS?

TYPES OF RECOMMENDATION SYSTEMS

DATASET FEATURES

DATASET CREATION BACKGROUND

BASIC DATASET INFORMATION

Total Unique Songs: 905, 712

Total Unique Users: 1,019,318

Total Unique Artists: 44K

Total Song Listens: 48,373,586

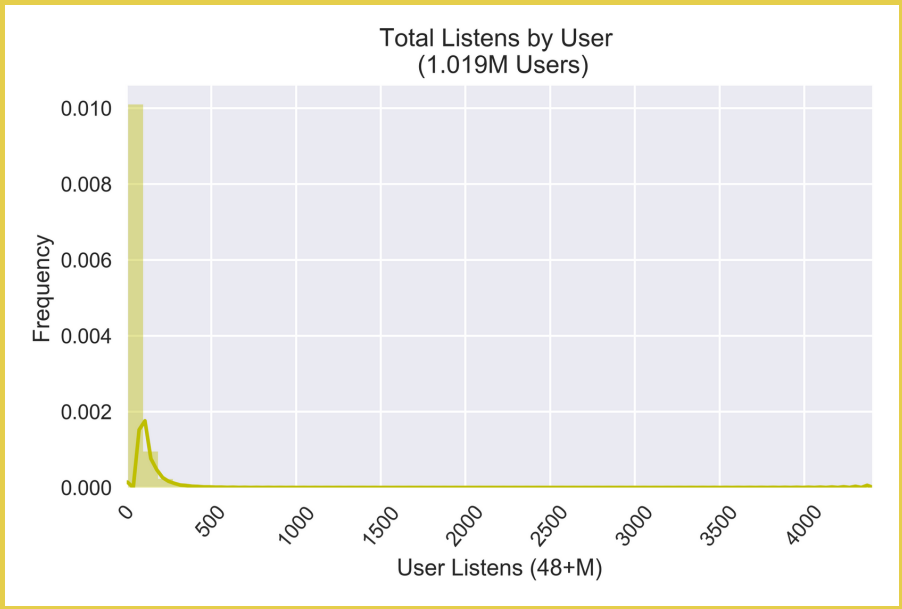
SUMMARY OF EXPLORATORY DATA ANALYSIS FINDINGS

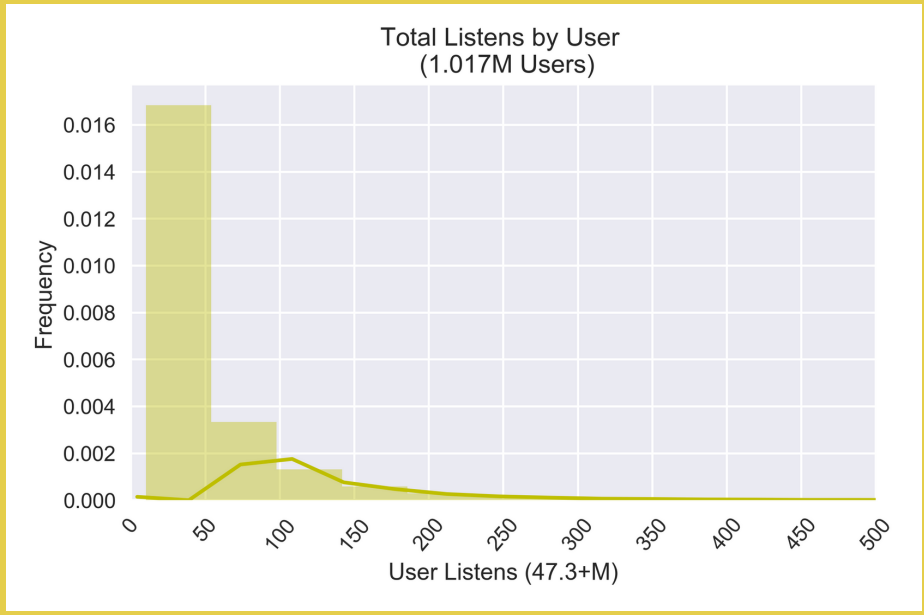
SKEWED USER ENGAGEMENT

Average listens per user is 45, standard deviation is 58.

10.8% of users have greater than 100 total listens.

1.4% of users had greater than 500 total listens.





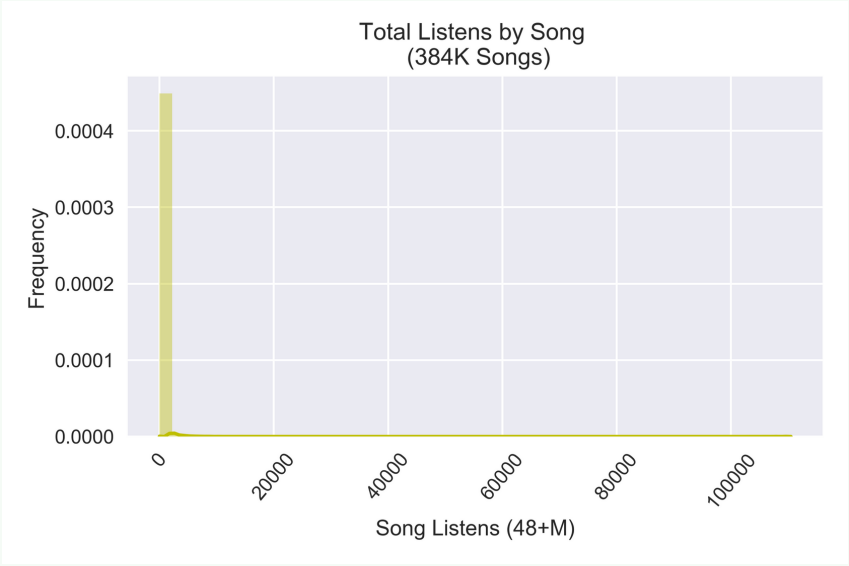
Min = 1, Max = 4,400

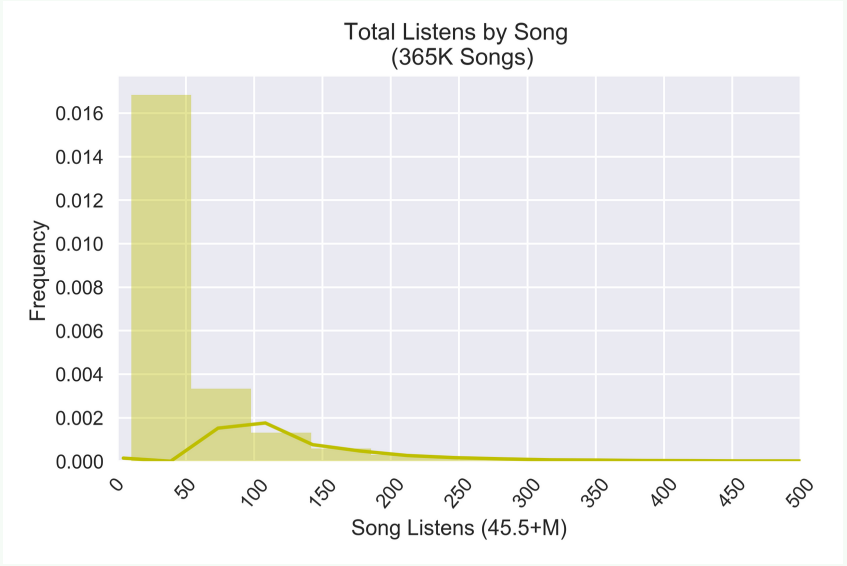
SKEWED SONG ENGAGEMENT

Average listens per song is 125.8, standard deviation is 799.02

16.9% of songs have greater than a 100 total listens.

42% of the total song catalog has been listened to.





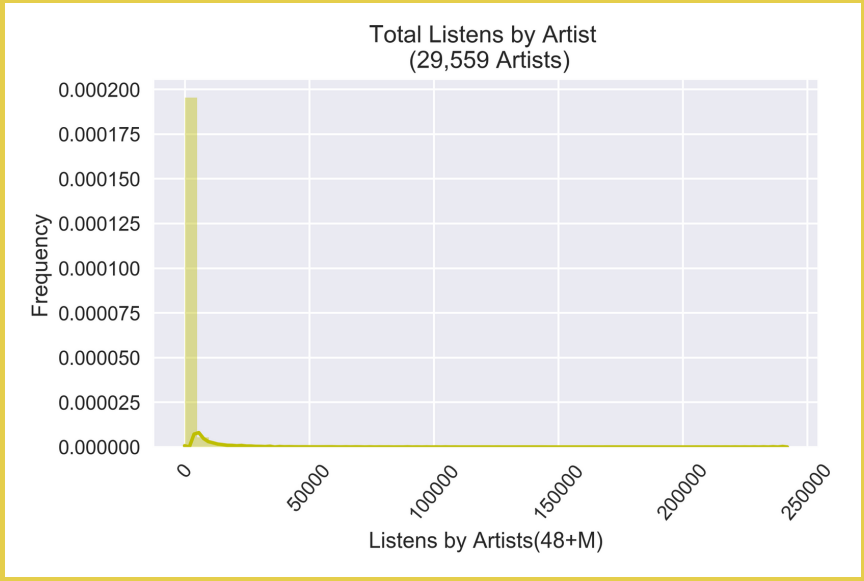
Min = 1, Max = 110,479

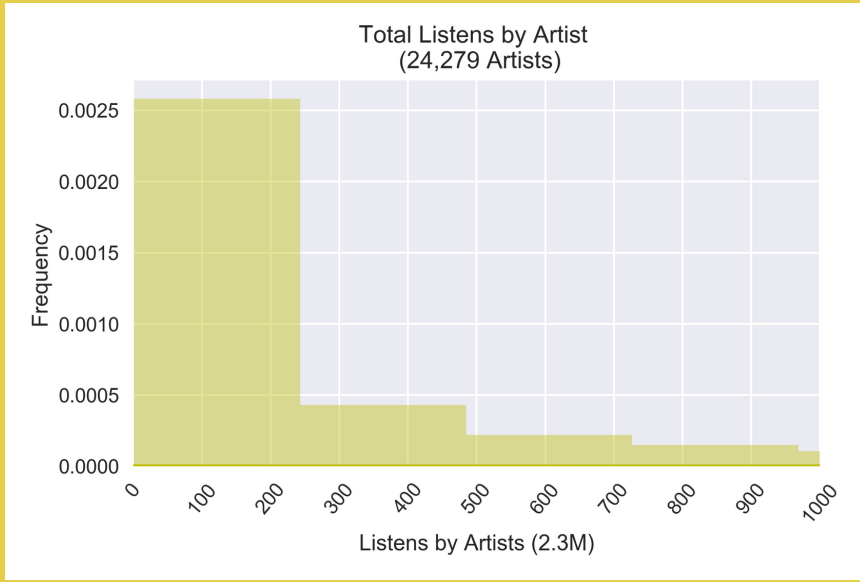
SKEWED ARTIST ENGAGEMENT

Average listens per artist is 1,367; standard deviation is 6,498

17.9% of artists have more than a 1,000 total listens.

Artists with listens below 1,000 represent 48% of total listens.





Min = 1, Max = 241,823

LONG TAILS WITH & VERY SPARSE MATRIX

The listens by song, user and artist suggest:

- A small proportion of users skews the distribution and creates a long tail. However, they do not account for a large fraction of listens.

- A minority of songs and artists account for a large fraction of listens.

A very sparse dataset:

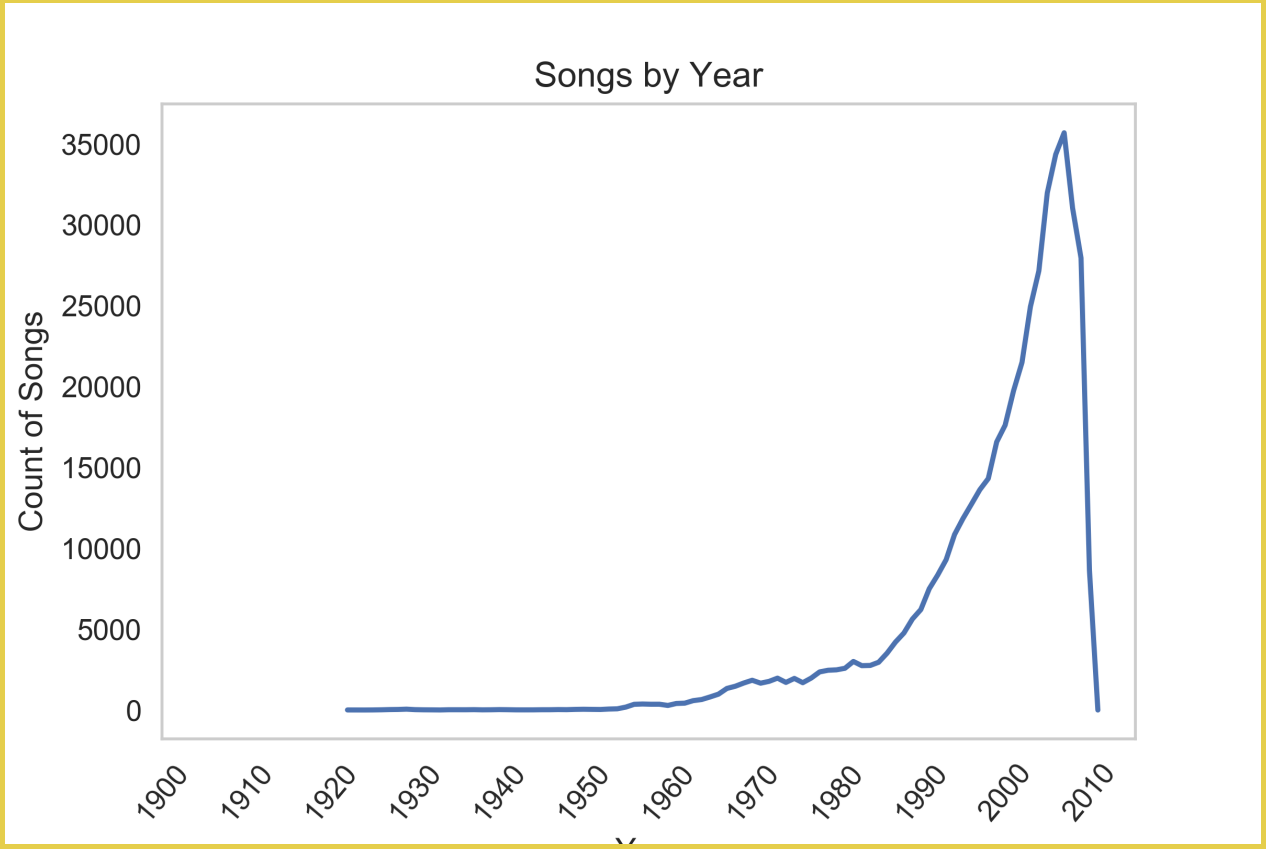
> Forty-two percent of the available catalog has been listened to.

> The average user has used the service 6 times and the most engaged user 4,400 times.

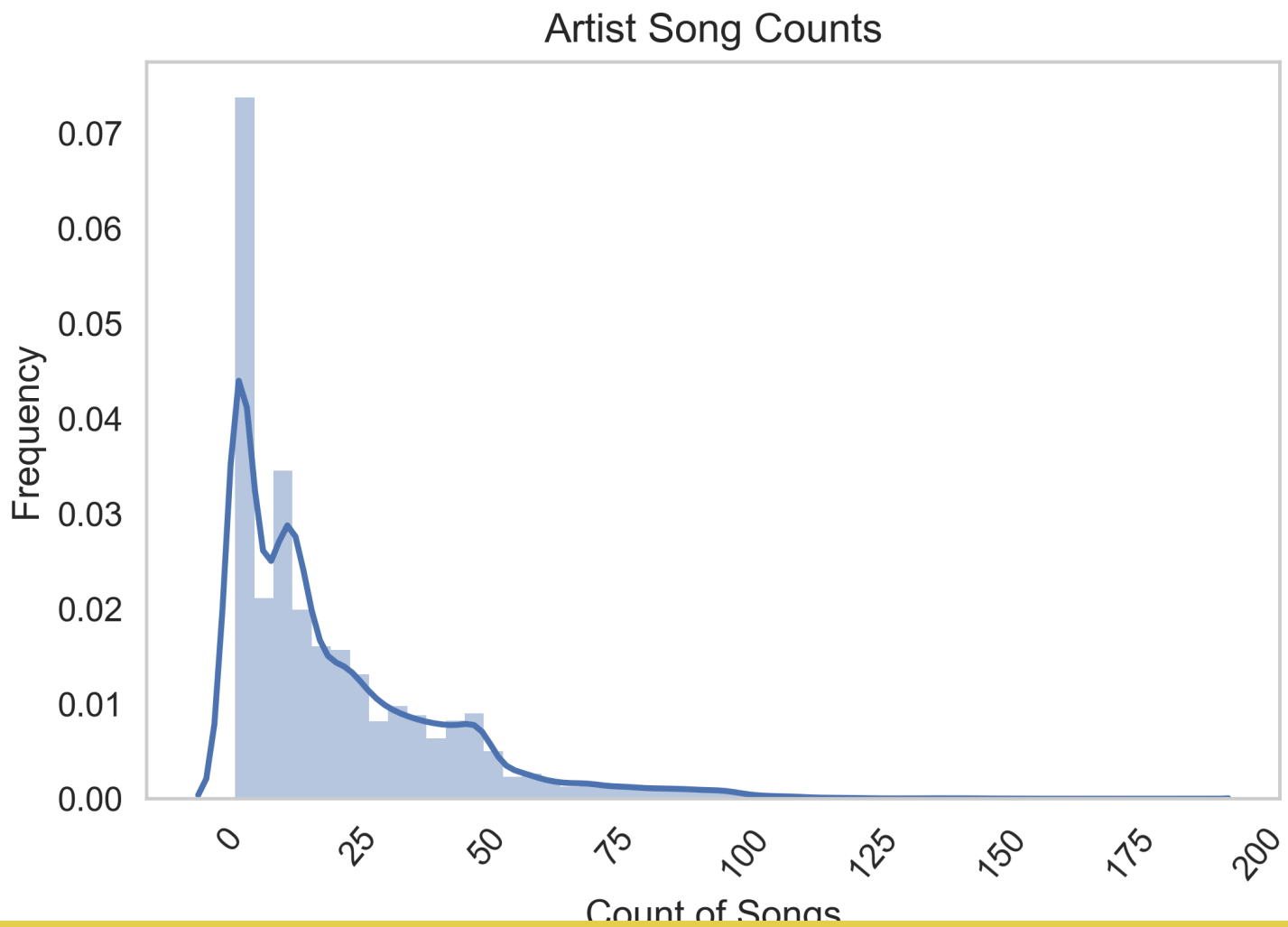
> As a result, the user and song matrix is extremely sparse.

AVAILABLE SONG YEAR DATA SUGGESTS SONGS BETWEEN 1990 - 2012 ARE OVERLY REPRESENTED IN THE DATASET

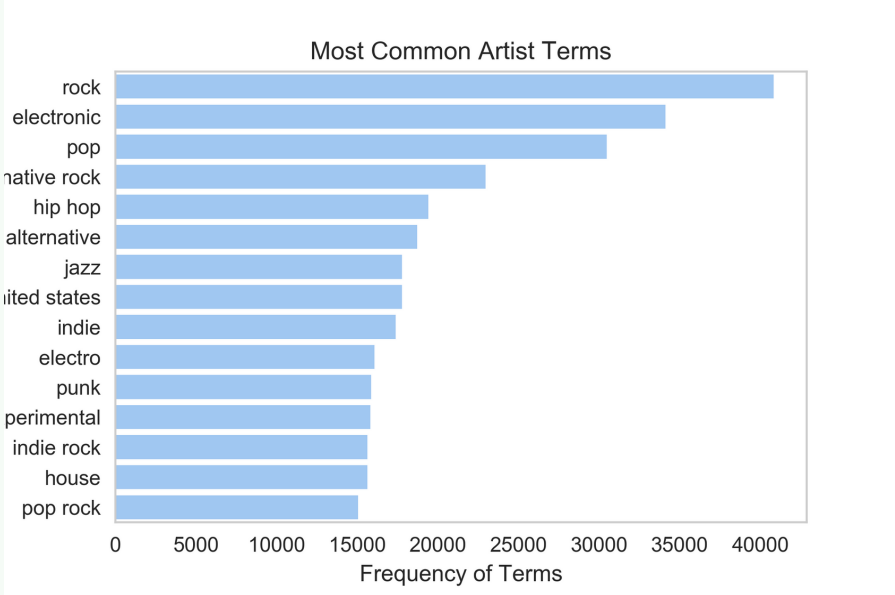
49.5% of song years are missing

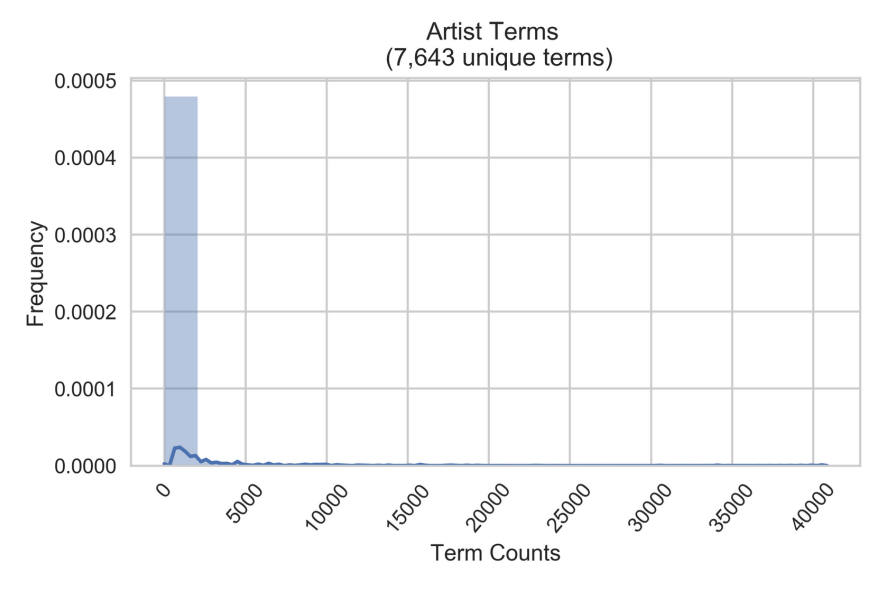


SOME SKEWNESS IN SONG PER ARTIST DISTRIBUTION

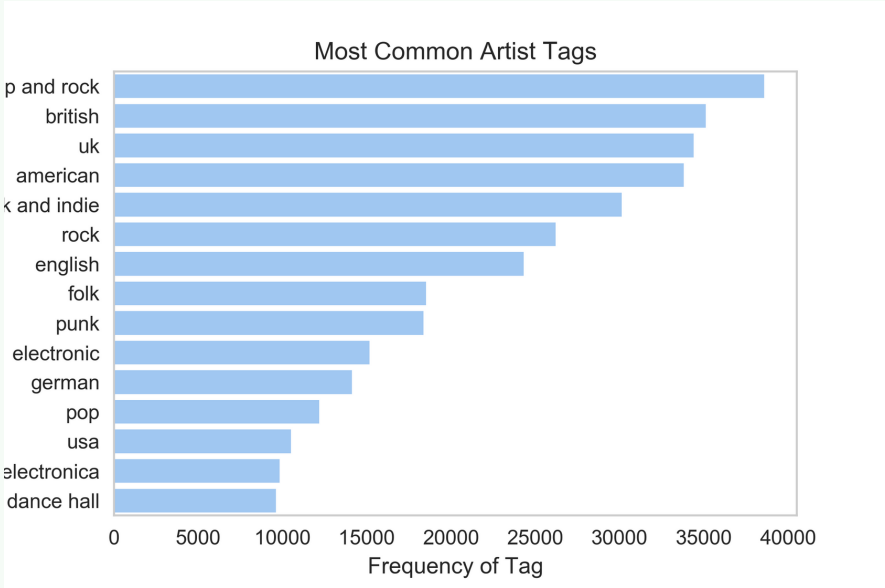


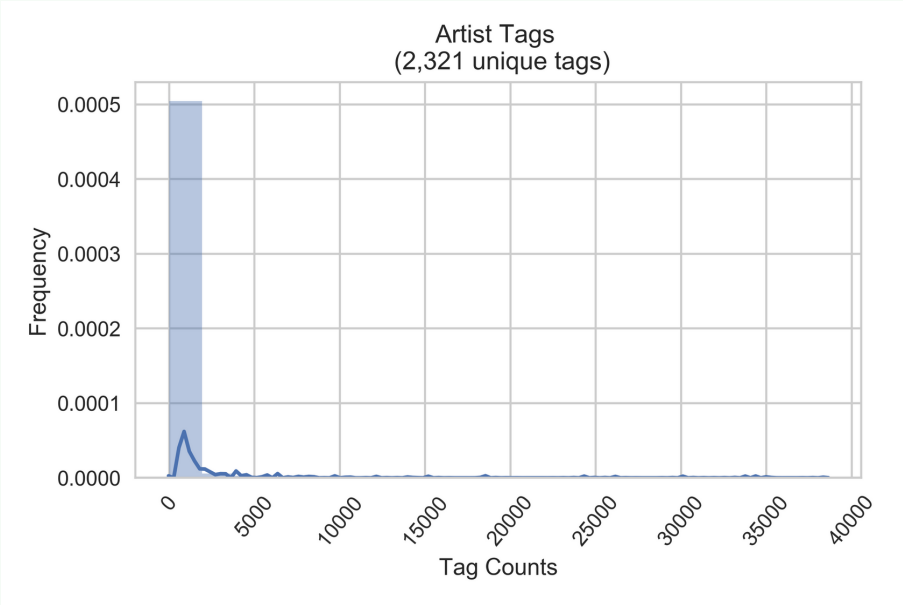
ARTIST TERMS



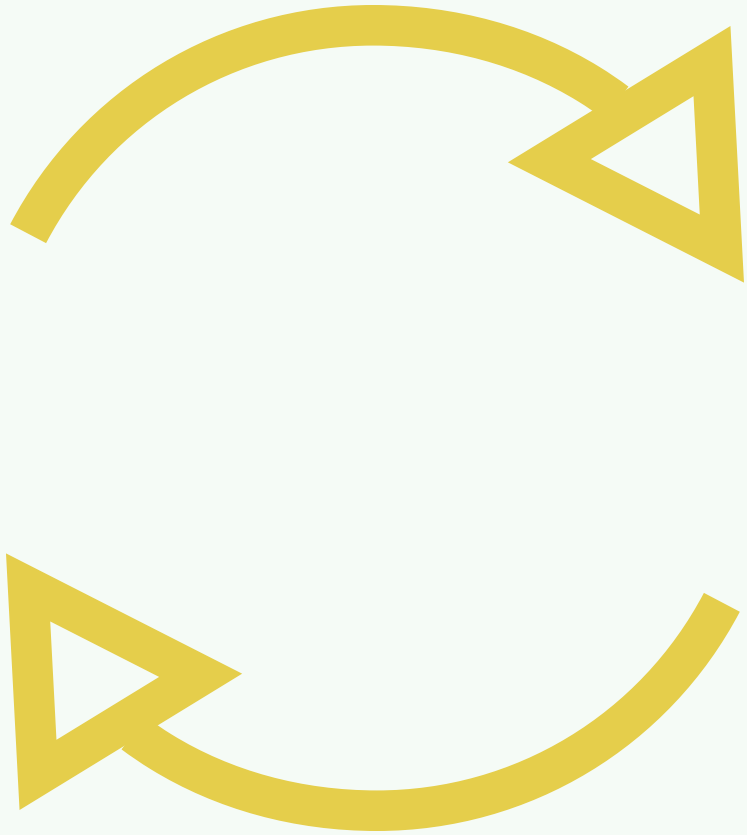


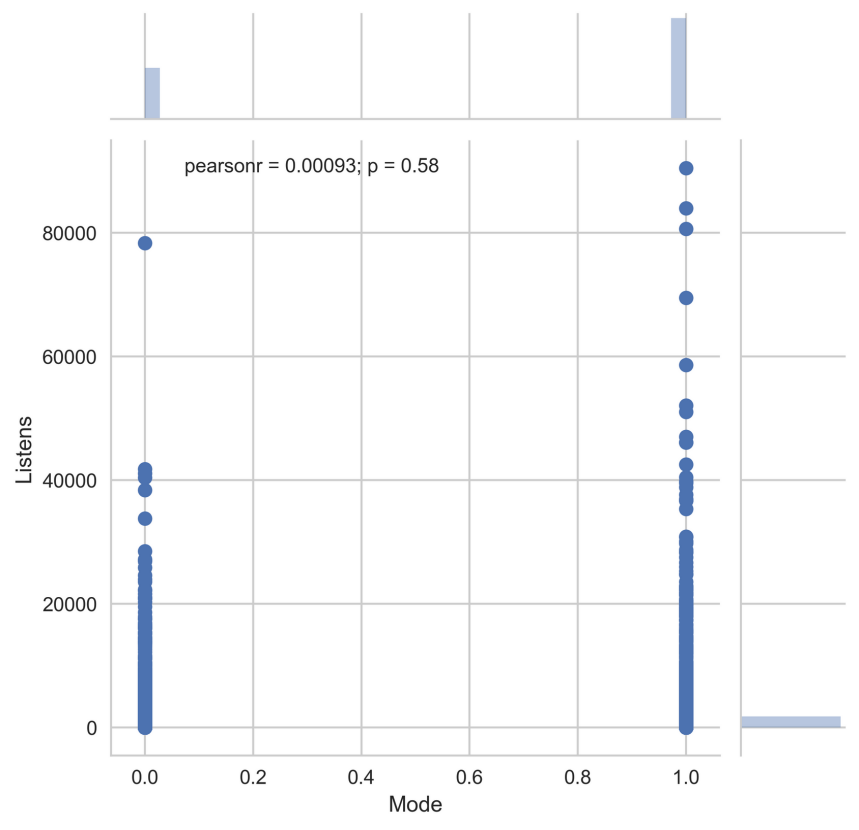
ARTIST TAGS


Most Common Artist Tags
p and rock
british
uk
american
k and indie
rock
english
folk
punk
electronic
german
pop
usa
electronica
dance hall
0
5000
10000
15000
20000
25000
30000
35000
40000
Frequency of Tag

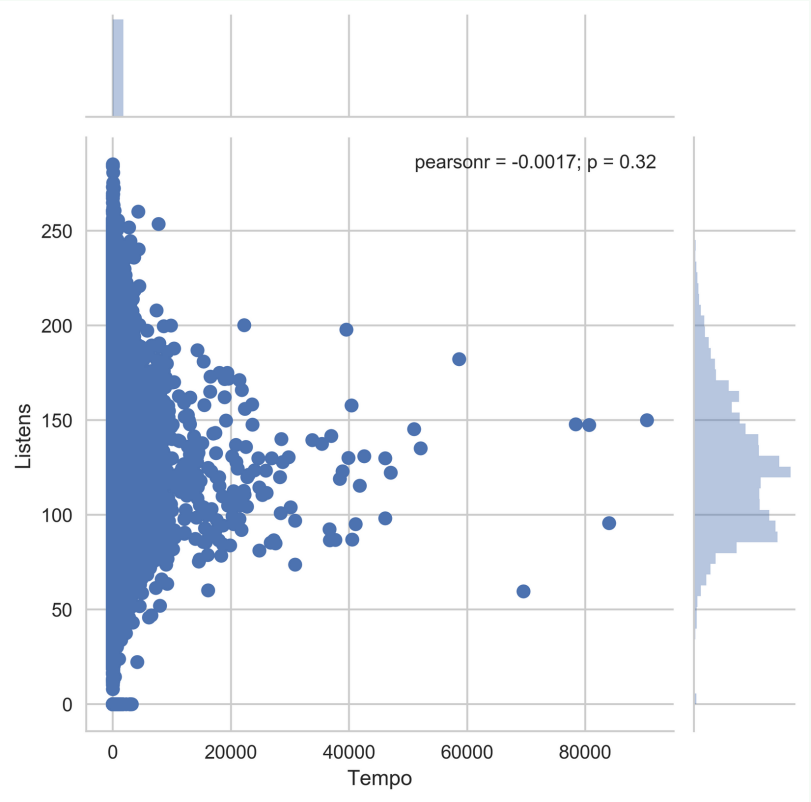

Artist Tags
(2,321 unique tags)
Frequency
0.0005
0.0004
0.0003
0.0002
0.0001
0.0000
0
5000
10000
15000
20000
25000
30000
35000
40000
Tag Counts

RELATIONSHIPS BETWEEN BASIC SONG FEATURES AND SONG LISTENS

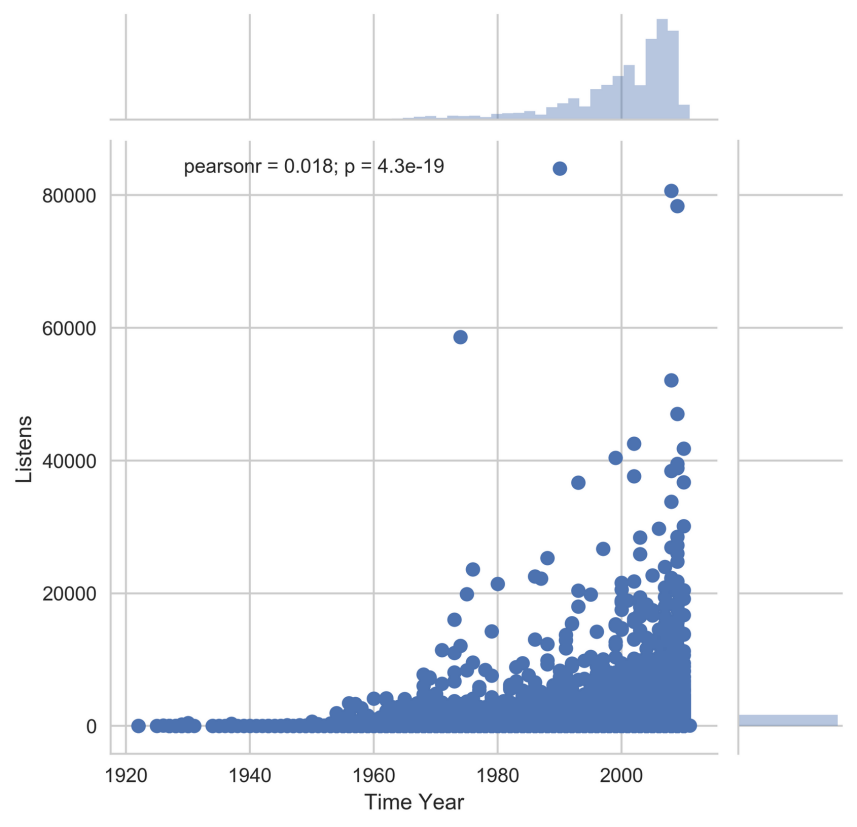




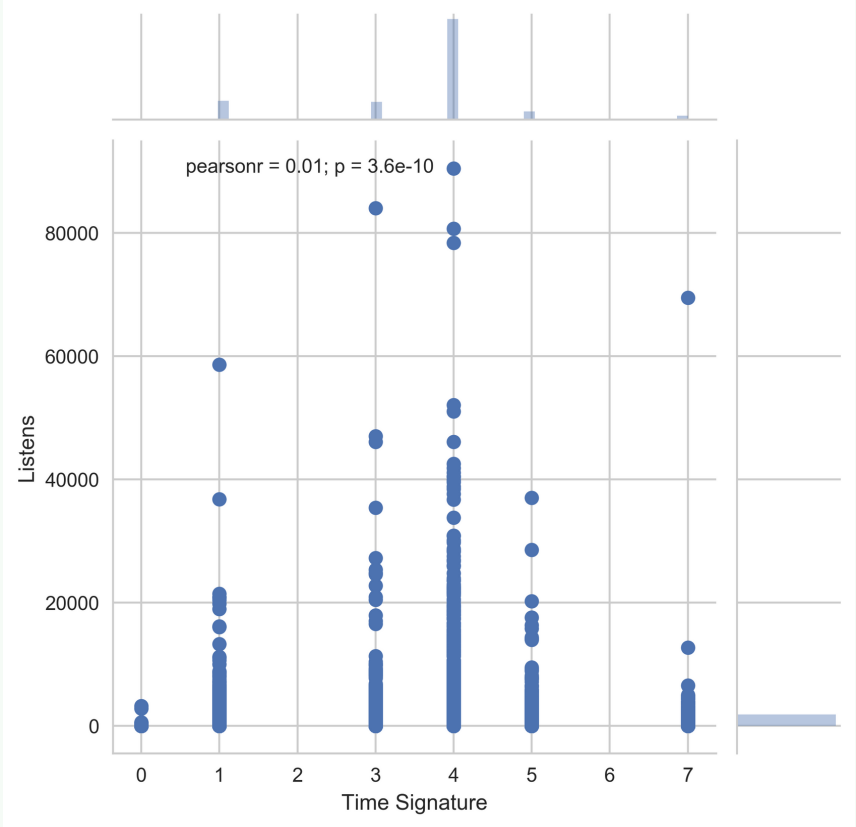
Song Mode



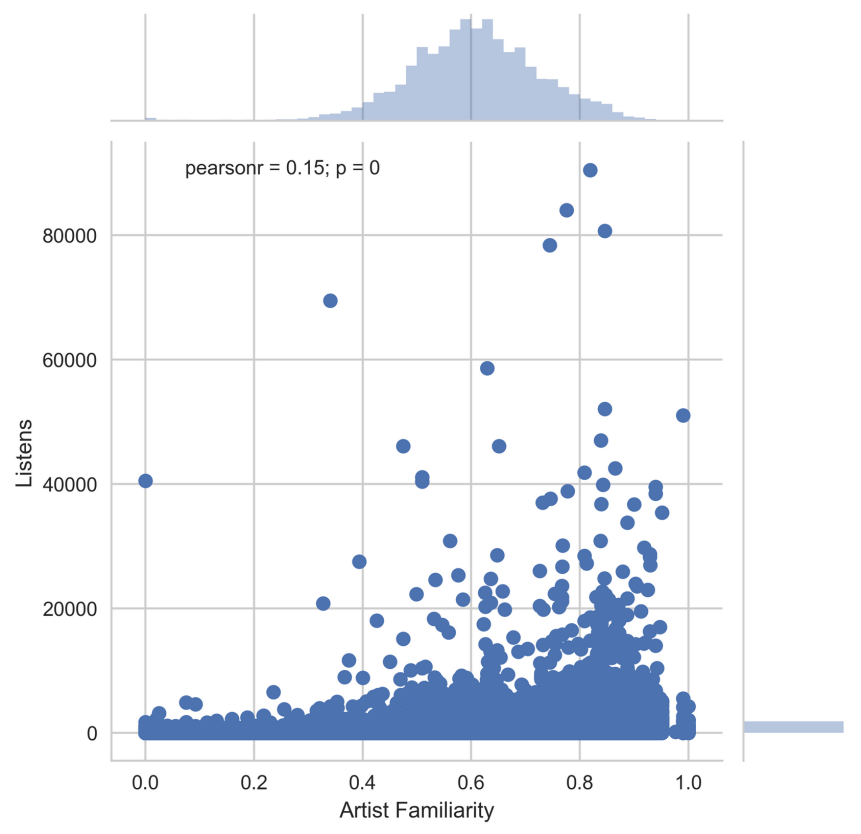
Song Tempo



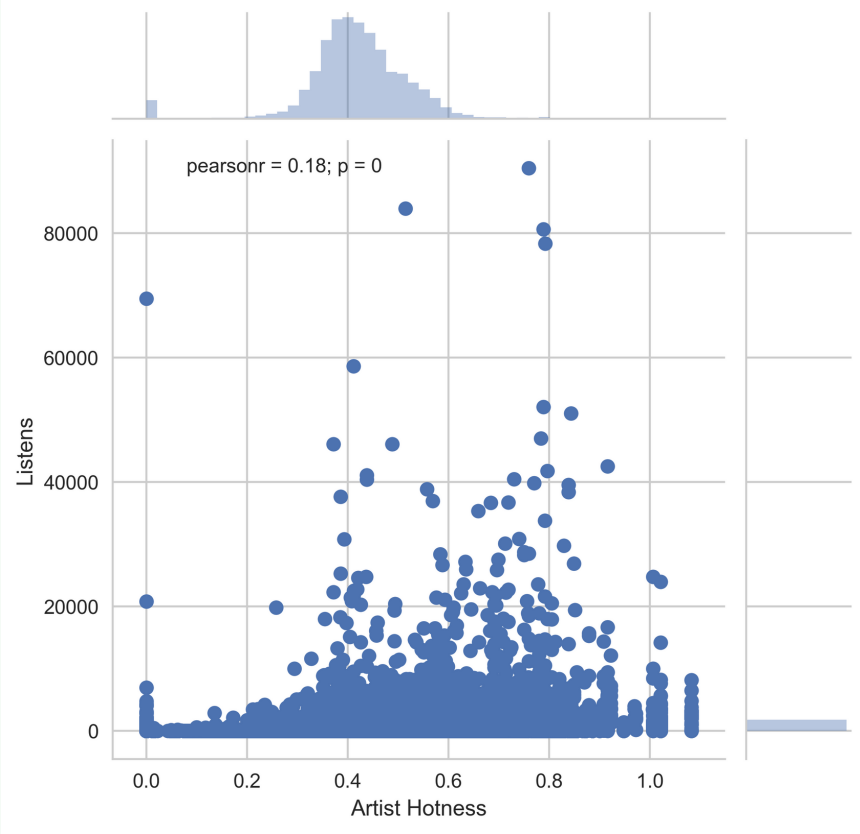
Year



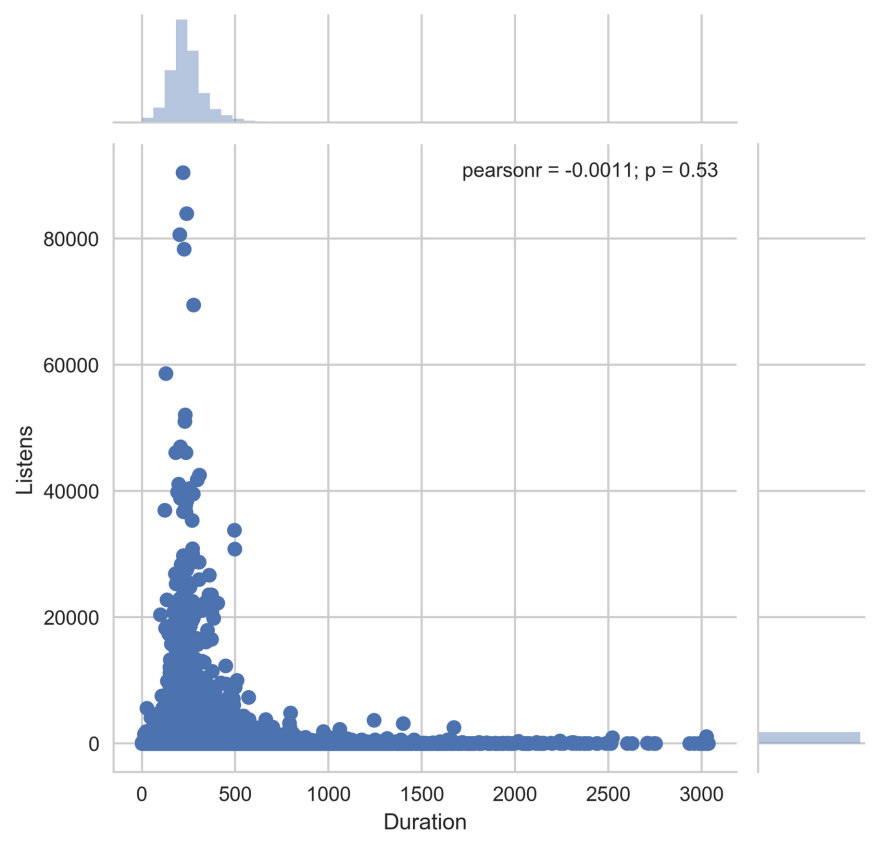
Time Signature



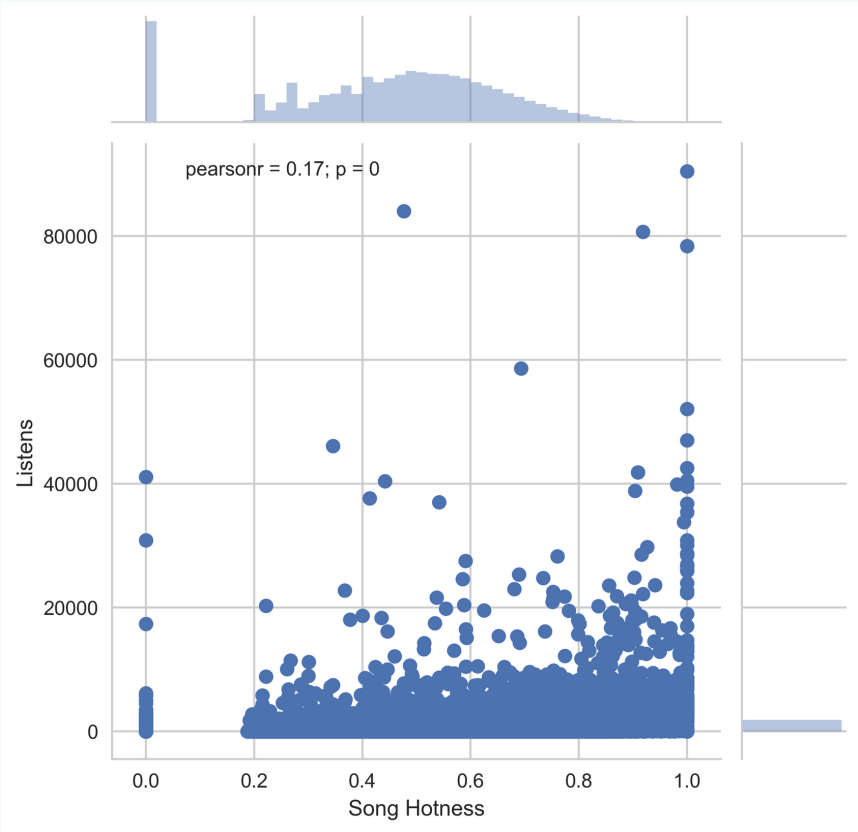
Artist Familiarity



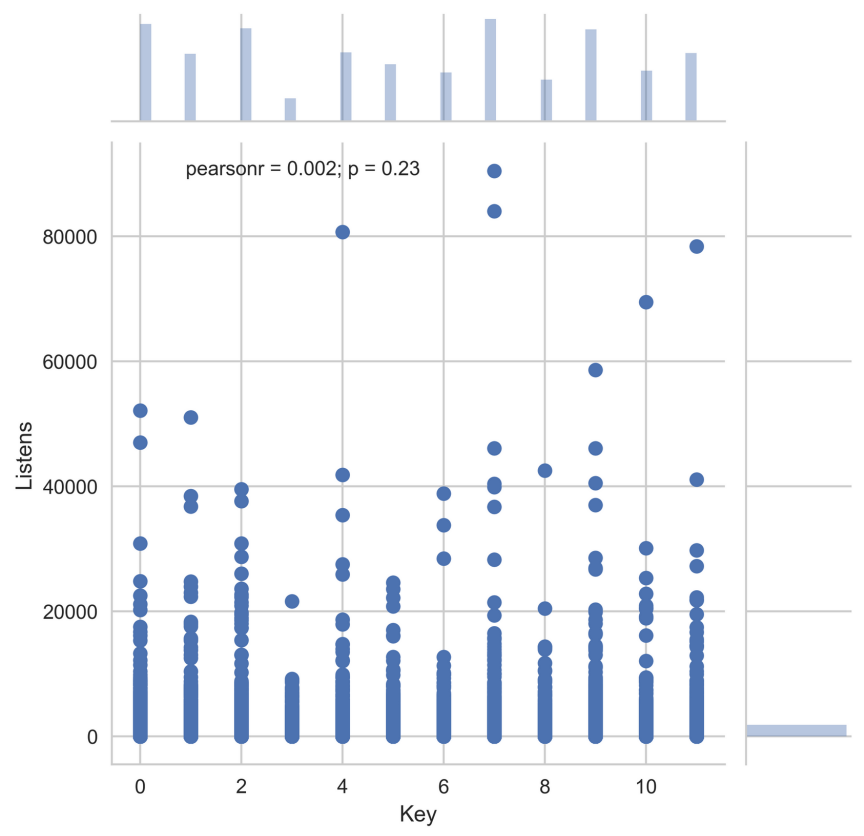
Artist Hotness



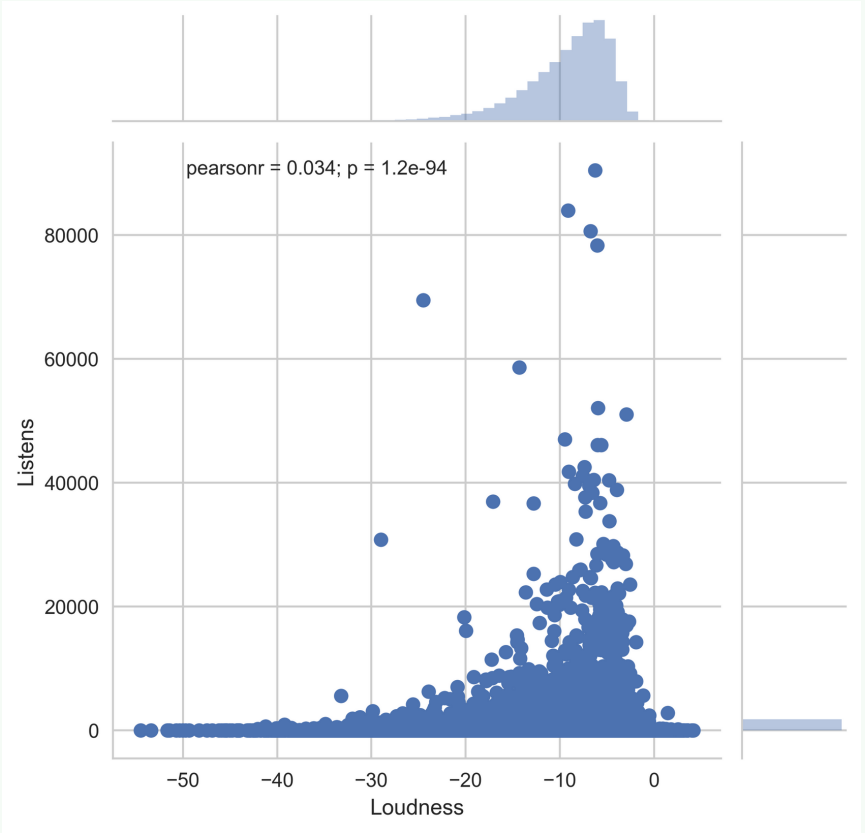
Duration



Song Hotness



Key



Loudness

RECOMMENDER SYSTEM IMPLEMENATTAION

FINAL THOUGHTS