Technical challenge:

My main technical challenge was making sense of the data to get some reports.

Challenge 1: Values are too small or too big

Since there were big distance between lowest and highest values of some features, plotting wouldn't make sense. I decided to divide some features into few categories to facilitate the report:

- Track_listens: represents number of times a track has been listened
- Track_interest: represent the number of times a track has been favourite or ranked.
- Bit_rate_factor: represents the quality of the track
- Track_duration: track's length in minutes

**Challenge 2**: None of the features' Values have any consistency and all fluctuate.

For example, a specific genre's ranking could vary from lowest to the highest in the chart in one year. Or many low quality tracks could have high interest ranking.

I tried different types of plotting but couldn't find a trend with any feature.
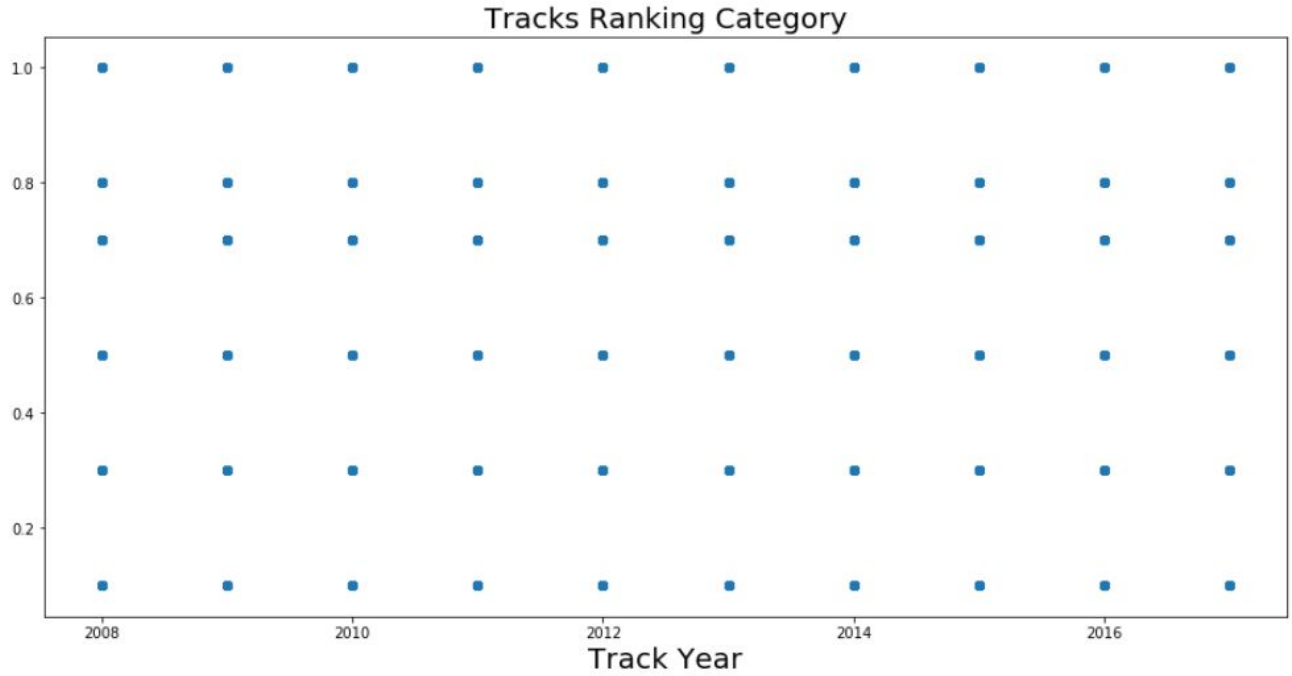
- Track length and Interest factor:
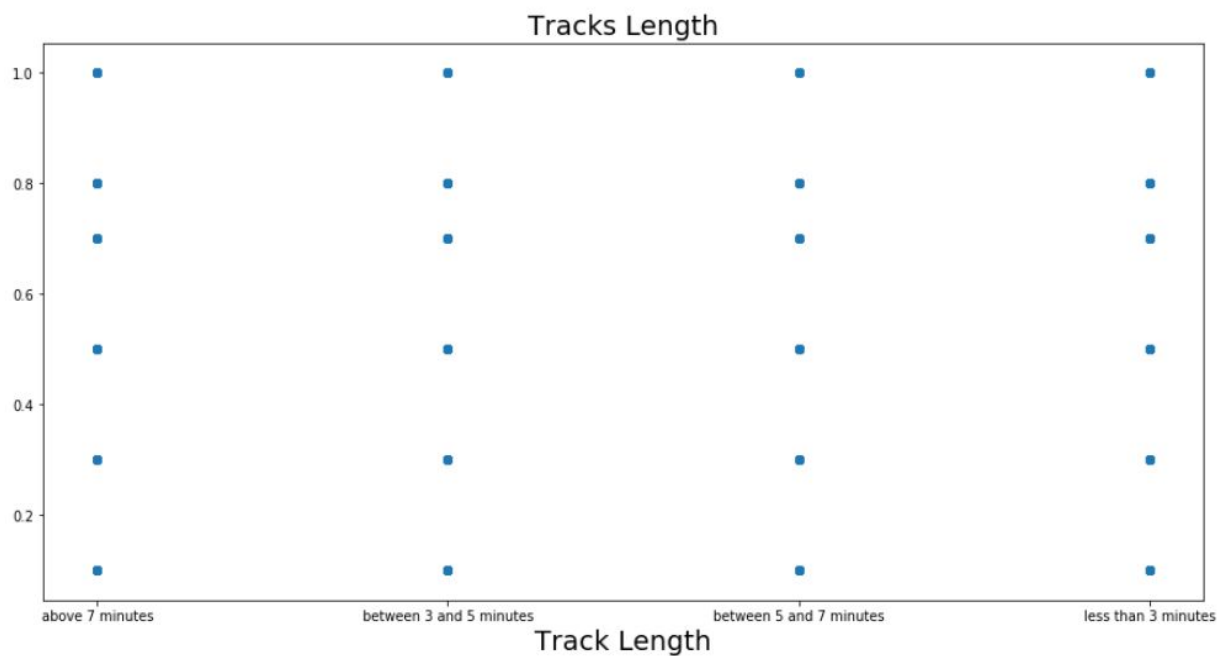
- Track Listens and Interest factor:
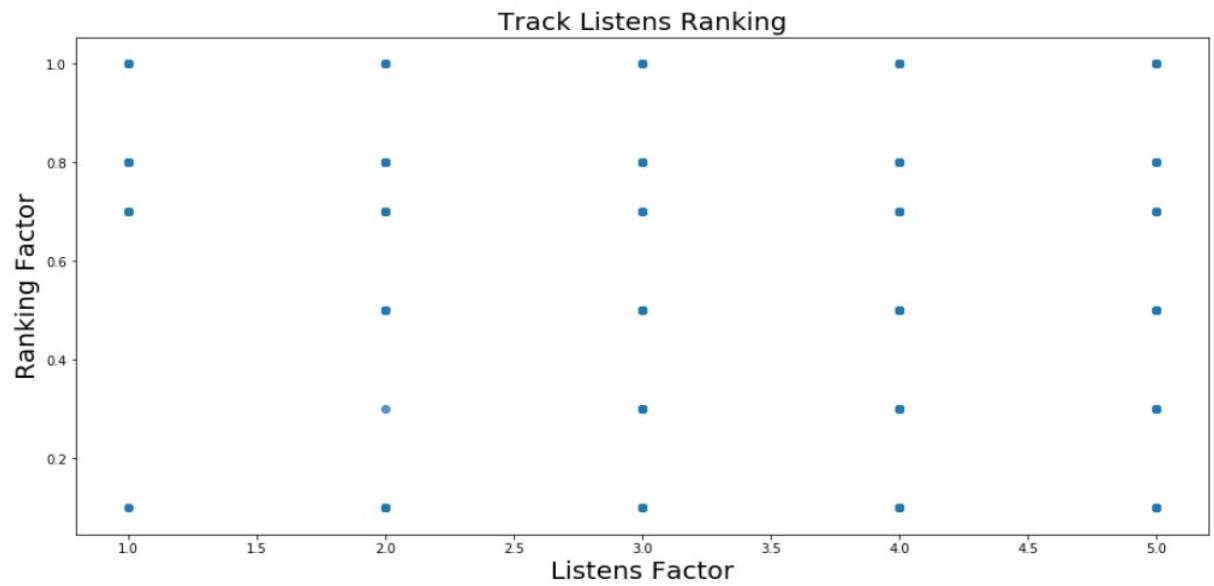
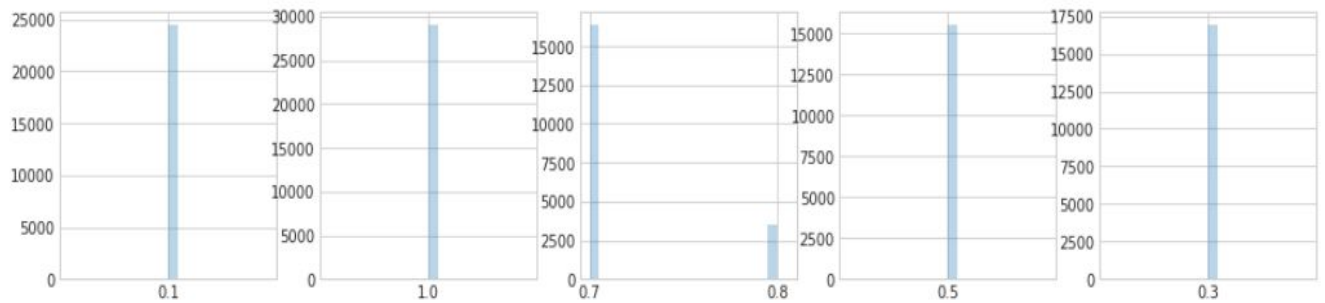- Track released year and interest factor:

Finally clustering helped me explore some relations.

- **Clustering Listen factor versus Ranking**

  It represents higher ranking among more listened tracks

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[('3', 11614), ('5', 6203), ('4', 3719), ('2', 2951), ('1', 5)]
[('1', 24720), ('2', 3176), ('3', 919), ('4', 169), ('5', 44)]
[('2', 12294), ('3', 3744), ('1', 2094), ('4', 1332), ('5', 469)]
[('4', 7745), ('3', 3911), ('5', 3865), ('2', 11)]
[('5', 12097), ('4', 4785), ('3', 30), ('2', 2)]
interest_factor
```


- **Clustering genres versus interest factor**

  Shows some specific genres such as Rock, Folk, and Electronic are always among the top three even if they had low interest factor.

  0: [('Rock', 1562), ('Folk', 1210), ('Electronic', 1100), ('Post-Punk,Rock,Punk', 837), ('Hip-Hop', 741)]

  1: [('Rock', 1824), ('Folk', 1386), ('Electronic', 1304), ('Post-Punk,Rock,Punk', 1226), ('Hip-Hop', 799)]
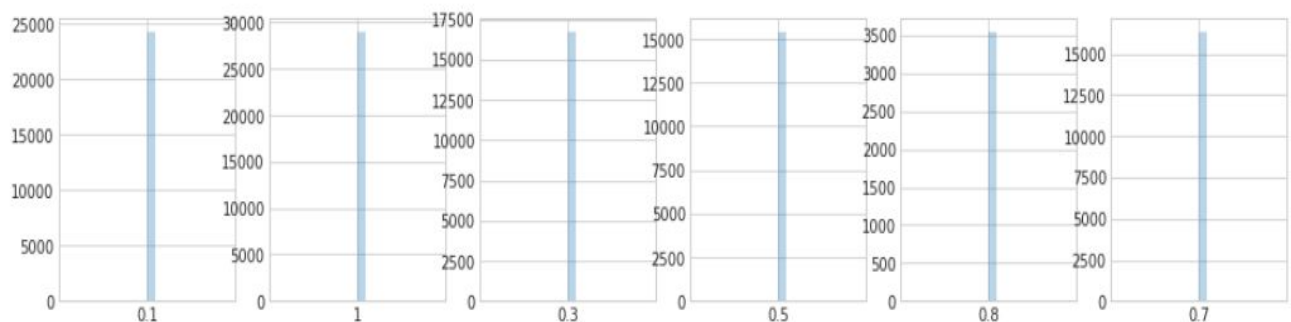
  2: [('Rock', 1220), ('Electronic', 888), ('Folk', 752), ('Post-Punk,Rock,Punk', 583), ('Hip-Hop', 552)]

  3: [('Rock', 1109), ('Folk', 817), ('Electronic', 702), ('Post-Punk,Rock,Punk', 581), ('Hip-Hop', 475)]

  4: [('Rock', 198), ('Electronic', 179), ('Folk', 164), ('Post-Punk,Rock,Punk', 133), ('Hip-Hop', 83)]

  5: [('Rock', 1048), ('Folk', 770), ('Electronic', 730), ('Post-Punk,Rock,Punk', 614), ('Hip-Hop', 470)]

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interest_factor
```
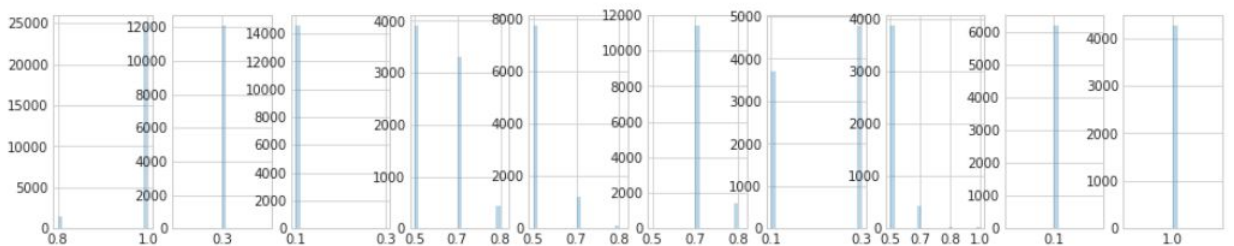
- **Clustering Track Year versus interest & listens**

  Shows there has been a boost after 2012.

```
[('2016', 5268), ('2015', 4833), ('2013', 3773), ('2014', 3189), ('2012', 3020)]
[('2010', 2146), ('2012', 1603), ('2013', 1561), ('2011', 1525), ('2009', 1192)]
[('2016', 2363), ('2015', 2221), ('2013', 1921), ('2014', 1623), ('2010', 1534)]
[('2009', 1221), ('2010', 1006), ('2012', 966), ('2013', 903), ('2016', 891)]
[('2010', 1480), ('2011', 1301), ('2013', 1198), ('2012', 1144), ('2009', 1098)]
[('2016', 2249), ('2015', 2143), ('2013', 1761), ('2014', 1564), ('2012', 1475)]
[('2009', 1335), ('2010', 1261), ('2013', 1032), ('2011', 1021), ('2012', 890)]
[('2010', 944), ('2009', 853), ('2011', 731), ('2013', 571), ('2012', 547)]
[('2009', 1049), ('2017', 1001), ('2016', 869), ('2010', 849), ('2011', 693)]
[('2009', 882), ('2011', 795), ('2010', 792), ('2012', 775), ('2013', 471)]
listens_factor
```
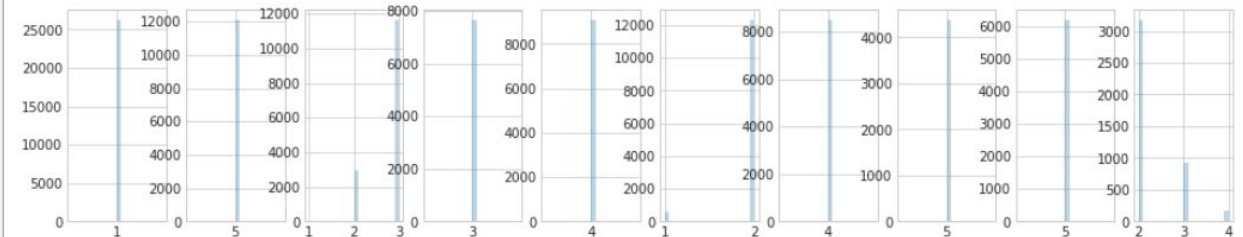

- **Clustering-Track Year versus Genres**

  Shows a trend of released genres through the years since 2009. The interest is moving towards more Rock, Folk, and Electronic

  2010 the worst year (many electronics, hip-hop, experimental created)
  After 2012 highest rank (mostly rock, folk, electronics)

  2008: variety of genres was released such as punk, post-punk, avant-garde, experimental. Also includes Rock, Electronic and Folk which have highest ranking compare to other genres in 2008

  2009: hip-hop is leading in this group but still number of listened is less than 500. And it has close competition with electronic, Folk, and Rock

  2010: variety of genres such as hip-hop, electronic, chip music were released but not been listened very much. Few Rock, no Folk

  2011 and 2012: genres have moved toward punk, post-punk but still many Rock and Folk been released

2013: Rock, Electronic, and Folk lead the competition

2014: Electronic, Hip-Hop, Pop, and Experimental Pop are still on top of the selection although number of tracks released in that year has decreased.

2015: Rock, Electronic, Folk are still in top of the chart

2016: Rock, Electronic, Folk

2017: Old-Time / Historic, Hip-Hop, Avant-Garde, Experimental

track_year_created