

## Rahim's Finding 1: Is there a correlation between the loudness of track and its energy?

Loudness: Overall Loudness of a track in decibels

Energy: Represents a perceptual measure of intensity and activity in a song

Correlation Coefficient Value ( $r$ )	Direction and Strength of Correlation
-1	Perfectly negative
-0.8	Strongly negative
-0.5	Moderately negative
-0.2	Weakly negative
0	No association
0.2	Weakly positive
0.5	Moderately positive
0.8	Strongly positive
1	Perfectly positive

I have decided to use a Pearson's Correlation test to measure the strength and direction of a potential linear correlation

### Hypothesis

(Null Hypothesis) : There **is no** correlation between Loudness and Energy in the top 100 songs

$$H_0 : r = 0$$

(Alternative Hypothesis): There **is** a correlation between Loudness and Energy in the top 100 songs

$$H_1 : r \neq 0$$

Significant Level = 5%(0.05) (assumed)

Critical Value( $p$ ) = 0.195

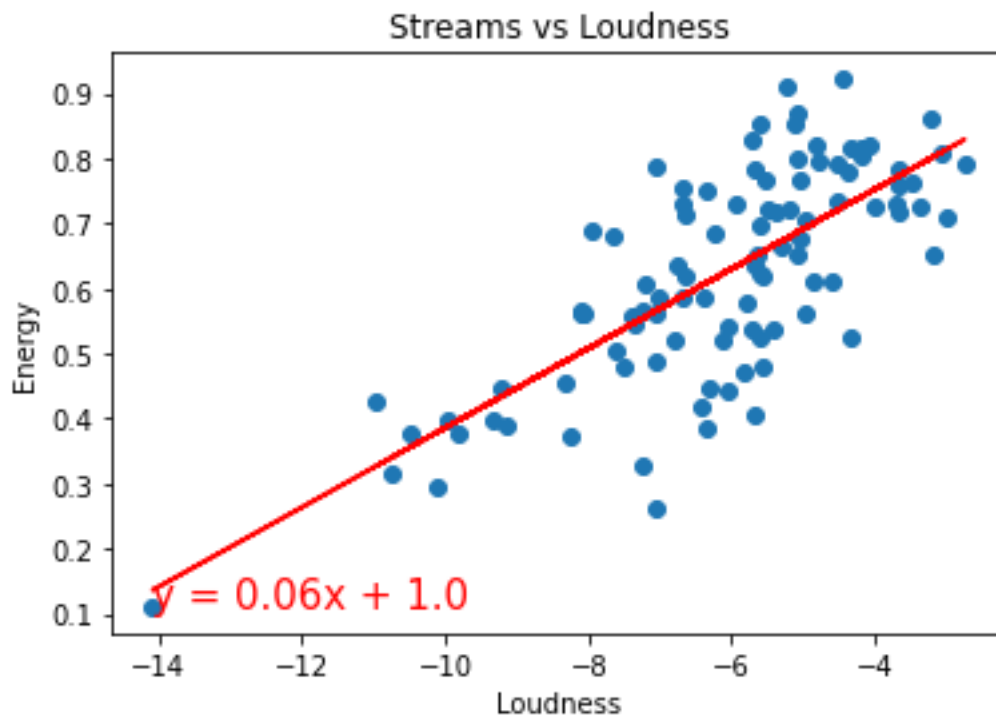
$$r = 0.74$$

$R^2 = 0.54 \rightarrow \times 100 = 54\%$  . Thus 54% of the variability in Loudness is explained by the variability in Energy. The remaining 46% is explained by the other variables that influence a track on the spotify api

Conclusion:

We can conclude from this test that our results are significant as the  $r$  value is greater than the critical value, so we would reject the null hypothesis. Concluding that there is a relationship between Loudness of a track and the Energy of a track

Graphical Representation of the relationship between **loudness of track and its energy**:



R squared: 0.5434088173021023 or 54%

There is a Strong positive correlation between the loudness of a track to its energy, the r value is 0.7371626803508858

## Findings 2

A Treemap of the genre of the top 100 songs for Spotify.



We intended on making this interactive however we ran out of time.

To do this we would have had to create a multi-index Dataframe where we would have the first index as the main genres (Pop, Rap, Hip Hop and House and others) then have the other subgenres in the secondary index.

Finding 3:

Another visual representation of the top genres.

