Spotify Artist Popularity Differences by Genre

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Methodology

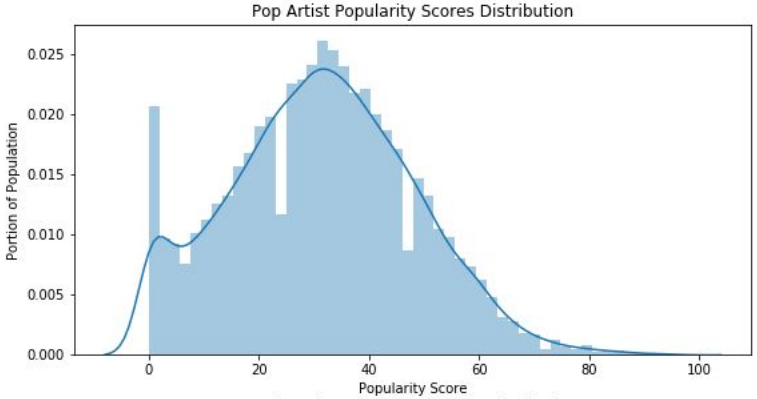
- Spotify API Dataset of ~53,000 Artists
  - Tagged Genres
  - Popularity Score
  - Follower Count

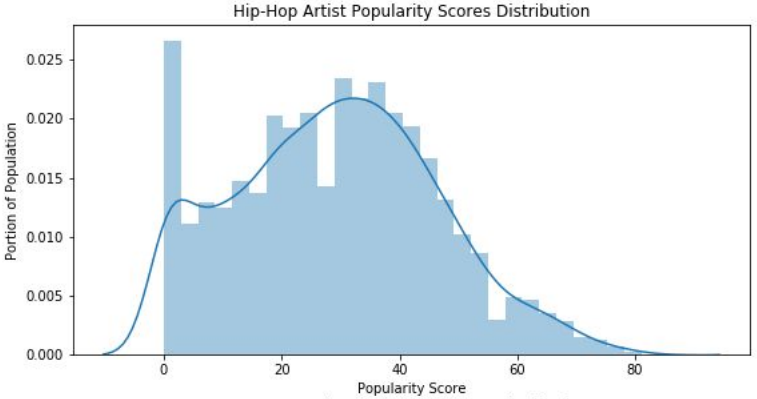
- Defined Scope
  - Pop, Hip-Hop, Rock, Country

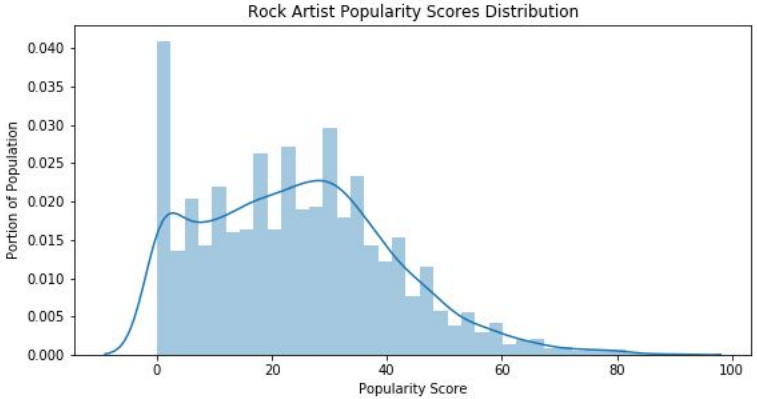
- Research Questions
  - 1. Do artists' popularity scores differ significantly by genre?
  - 2. Do artists' follower counts differ significantly by genre?

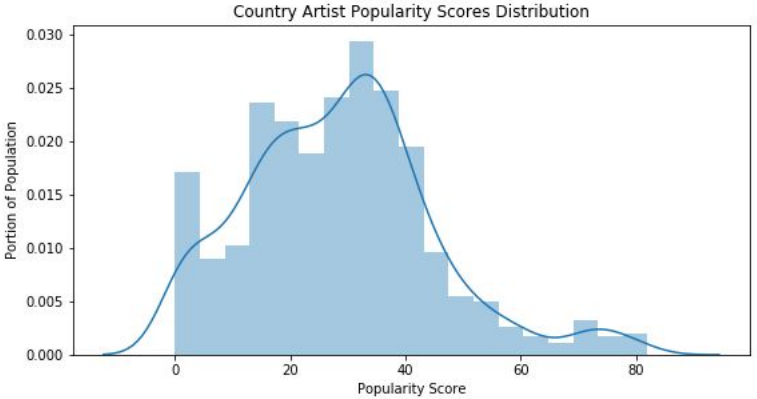
Research Question 1:

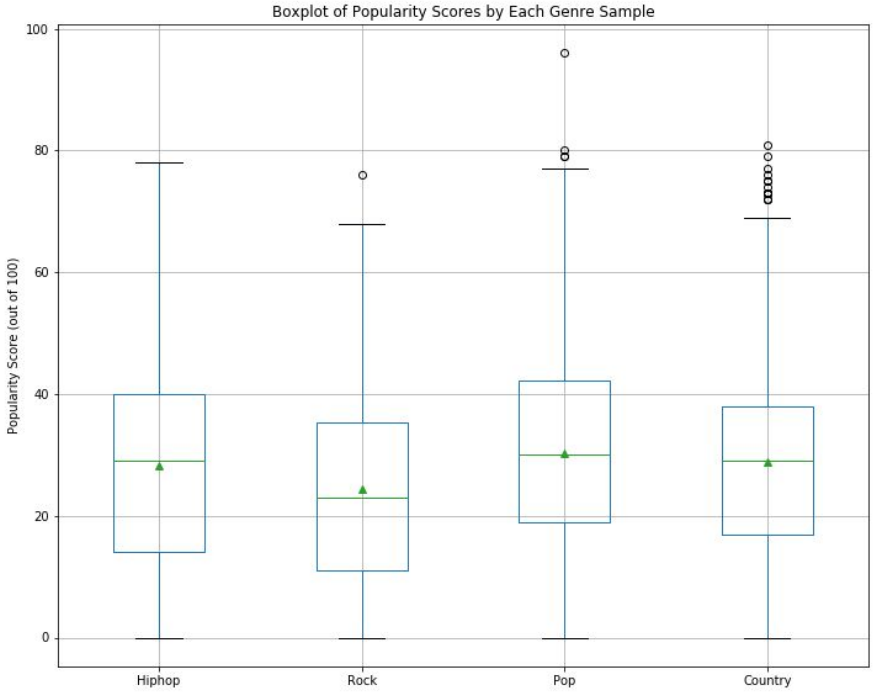
Do artists' *popularity scores* differ significantly by genre?











Test 1: Are popularity score means the same across genres?

ANOVA Test

H_0 (Null Hypothesis): $\mu_{pop} = \mu_{rock} = \mu_{hiphop} = \mu_{country}$ popularity score means are equal for all genres

H_a (Alternative Hypothesis): popularity score means are NOT equal for all genres

Significance Level: $\alpha = 0.05$

ANOVA Results

F-Score: 135.69
P-Value 1.4977e-86

Sufficient evidence to **reject the null hypothesis** (statistically significant difference observed between Pop, Rock, Country and Hip-Hop popularity score means).

Tests 2 & 3: How do popularity scores compare between genres?

Tukey Test

Compares mean popularity score of Genre 1 to Genre 2 to test if there is a significant difference between means.

H_0: $\mu_{genre1} = \mu_{genre2}$

H_a: $\mu_{genre1} \neq \mu_{genre2}$

Welch T-Test

Compares mean popularity score of Genre 1 to Genre 2 to test if Genre 1 has a significantly higher mean than Genre 2.

H_0: $\mu_{genre1} <= \mu_{genre2}$

H_a: $\mu_{genre1} > \mu_{genre2}$

		Tukey Test		Welch T-Test (1-Sided)	
Genre 1	Genre 2	P-Value	Reject	P-Value	Reject
Pop	Rock	0.001	True	7.37e-90	True
Hip-Hop	Rock	0.001	True	1.43e-21	True
Pop	Hip-Hop	0.001	True	9.03e-11	True
Country	Rock	0.0017	True	0.0001	True
Pop	Country	0.001	True	3.73e-06	True
Hip-Hop	Country	0.5285	False	0.0901	False

Assumed Significance Level: $\alpha = 0.05$

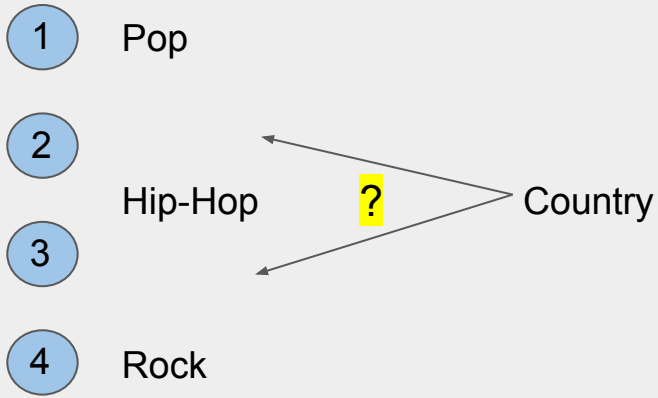
Research Question 1:

Do artists' popularity scores differ significantly by genre?

Finding:

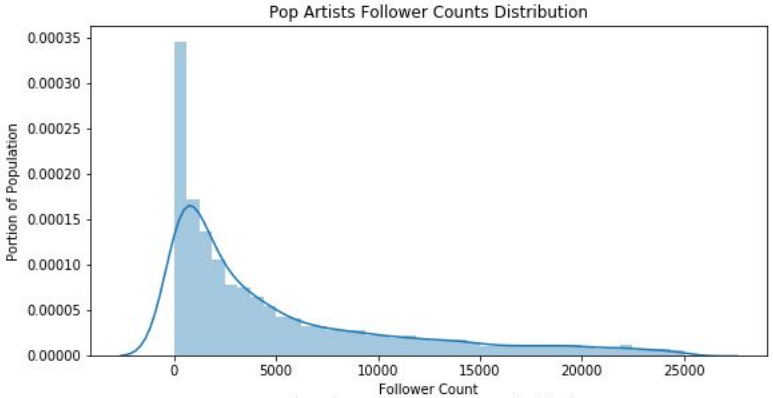
Popularity score means differ significantly between pop, rock, hip-hop, and country genres.

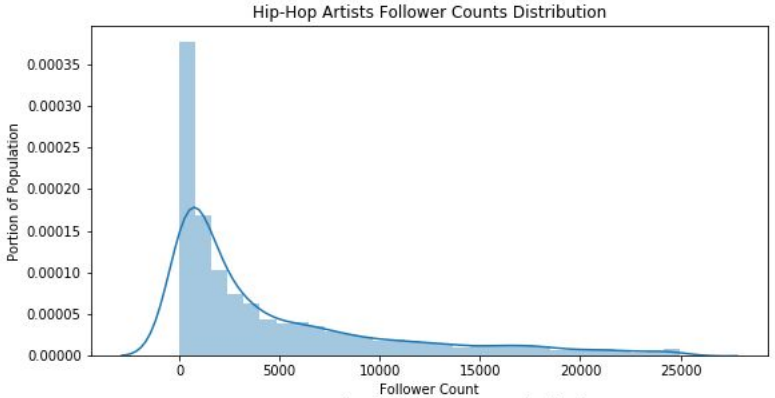
BUT no significant difference observed between hip-hop and country, specifically.

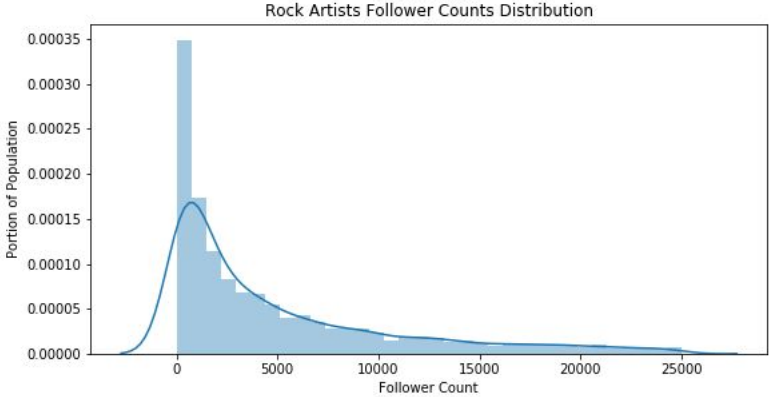


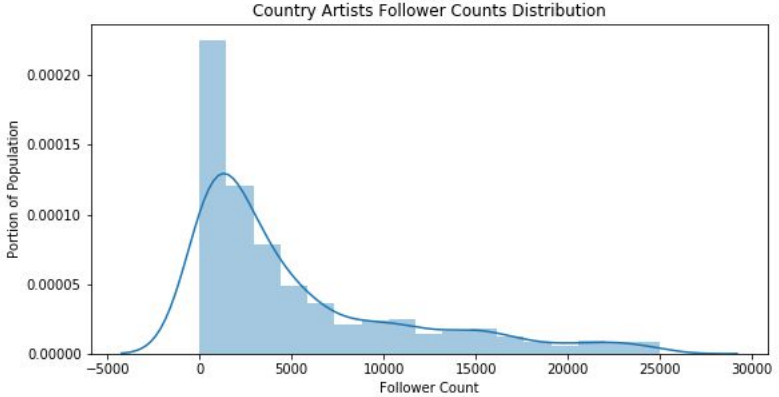
Research Question 2:

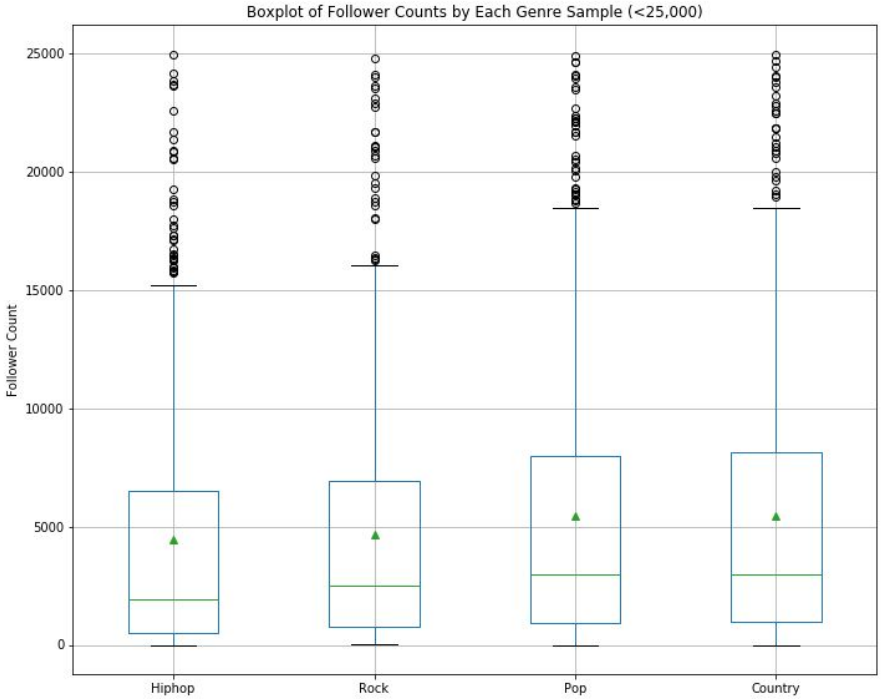
Do artists' *follower counts* differ significantly by genre?











Test 1: Are follower count means the same across genres?

ANOVA Test

Null Hypothesis: all follower count means are equal

H_0: $\mu_{pop} = \mu_{rock} = \mu_{hiphop} = \mu_{country}$

Alternative Hypothesis:

H_a: not all follower count means are equal

Significance Level: $\alpha = 0.05$

ANOVA Results

F-Score: 2.3441

P-Value 0.0710

Fail to reject null hypothesis (no statistically significant observed difference between Pop, Rock, Country and Hip-Hop follower counts).

Tests 2 & 3: How do follower counts compare between genres?

<u>Tukey Test</u>
Compares mean follower count of Genre 1 to Genre 2 to test if there is a significant difference between means.

H_0: $\mu_{genre1} = \mu_{genre2}$
H_a: $\mu_{genre1} \neq \mu_{genre2}$

<u>Welch T-Test</u>
Compares mean follower count of Genre 1 to Genre 2 to test if Genre 1 has a significantly higher mean than Genre 2.

H_0: $\mu_{genre1} <= \mu_{genre2}$
H_a: $\mu_{genre1} > \mu_{genre2}$

		Tukey Test		Welch T-Test (1-Sided)	
Genre 1	Genre 2	P-Value	Reject	P-Value	Reject
Pop	Hip-Hop	0.0506	False	0.0049	True
Pop	Rock	0.5821	False	0.1026	False
Pop	Country	0.8414	False	0.2023	False
Hip-Hop	Rock	0.5487	False	0.0891	False
Hip-Hop	Country	0.9	False	0.3313	False
Rock	Country	0.9	False	0.3922	False

Assumed Significance Level: $\alpha = 0.05$

Research Question 2:

Do artists' follower counts differ significantly by genre?

Finding:

Follower count means do NOT differ significantly between pop, rock, hip-hop, and country genres.