

From the
Billboard Hot 100
to the
Grammy Awards



Team Five



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NetSuite Consultant at NAPPJO

Joined Data Analytics Course to gain understanding of basic coding & data analytics concepts



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Vice President Finance
National Home Builder

Joined Data Analytics Course for a new challenge



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2020 University of Texas B.S.A.
Mathematics Graduate

Joined Data Analytics Course to learn basic coding and jump start career.



LIJOY JOMOL

Certified Math Teacher

Joined Data Analytics Course for a career change.

Question

Does inclusion on the Billboard Hot 100 Chart impact the likelihood that a song will win a Grammy Award?

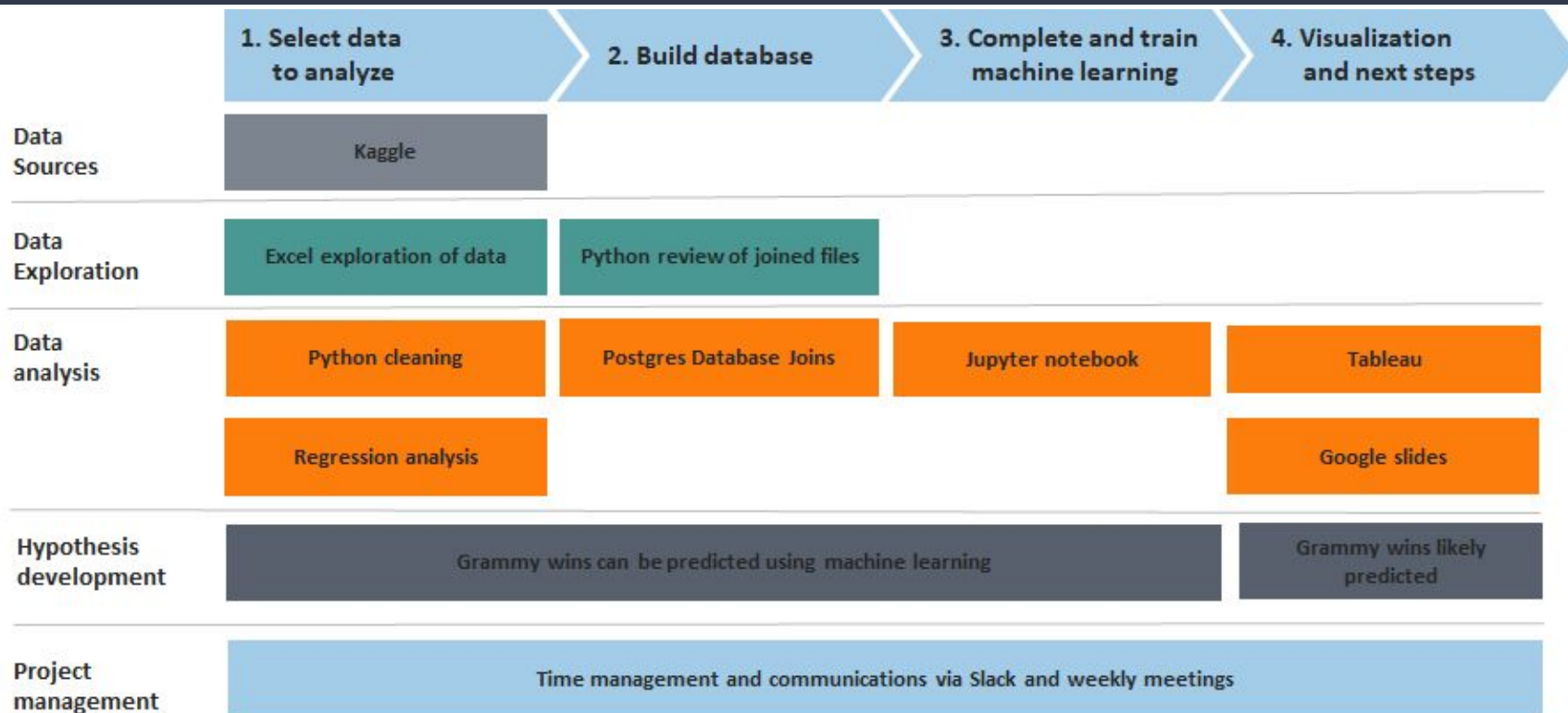


Anderson Paak & Bruno Mars -
"Sonic Song" currently #1 on Billboard Hot 100

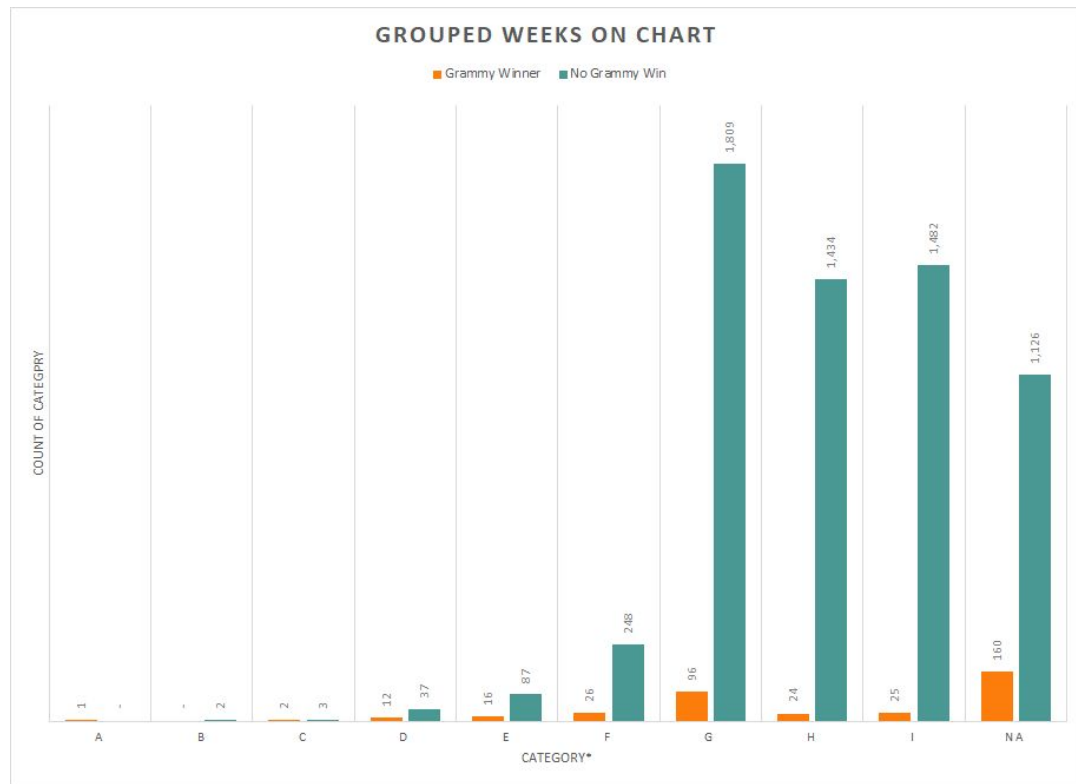


Taylor Swift -
11- time Grammy Award Winner

Project Outline

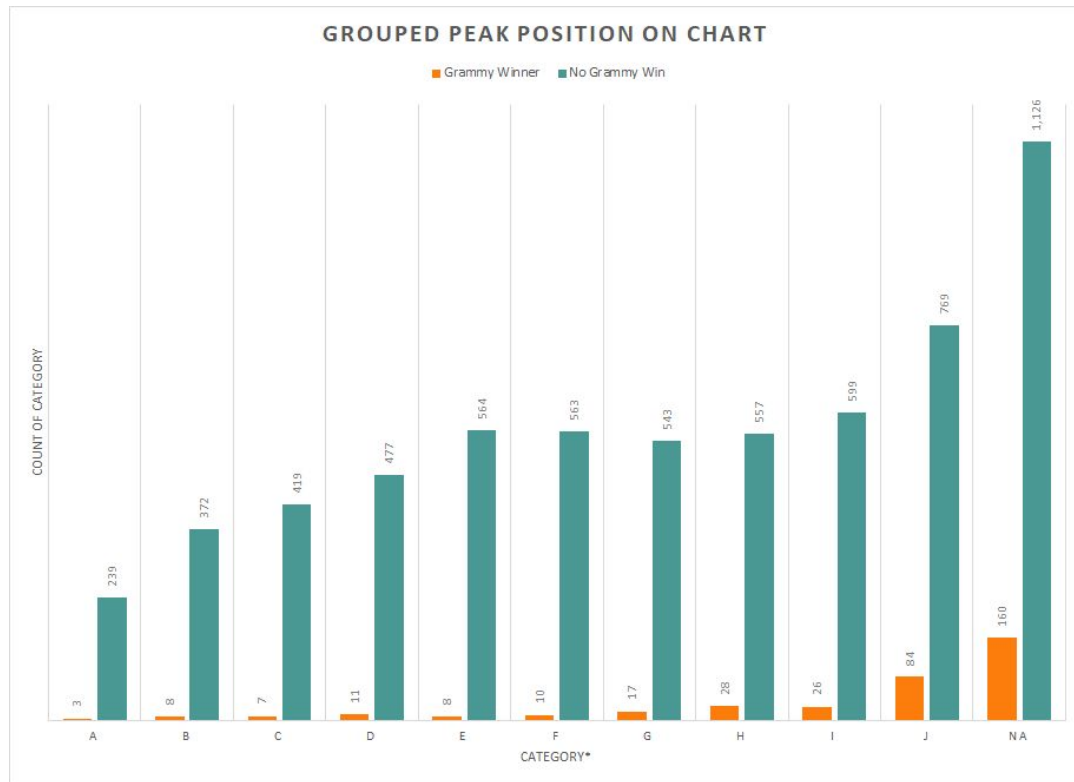


Data Exploration



- Tools Used: Excel
- Total weeks on Billboard Chart
- Grouped categories based on statistical results
 - A - Greater than or equal to 80
 - B - Greater than or equal to 70
 - C - Greater than or equal to 60
 - D - Greater than or equal to 50
 - E - Greater than or equal to 40
 - F - Greater than or equal to 30
 - G - Greater than or equal to 20
 - H - Greater than or equal to 10
 - I - Less than 10
 - NA - Not ranked
- Initial results showed little correlation between weeks on chart and a Grammy win ($r = 0.008$)

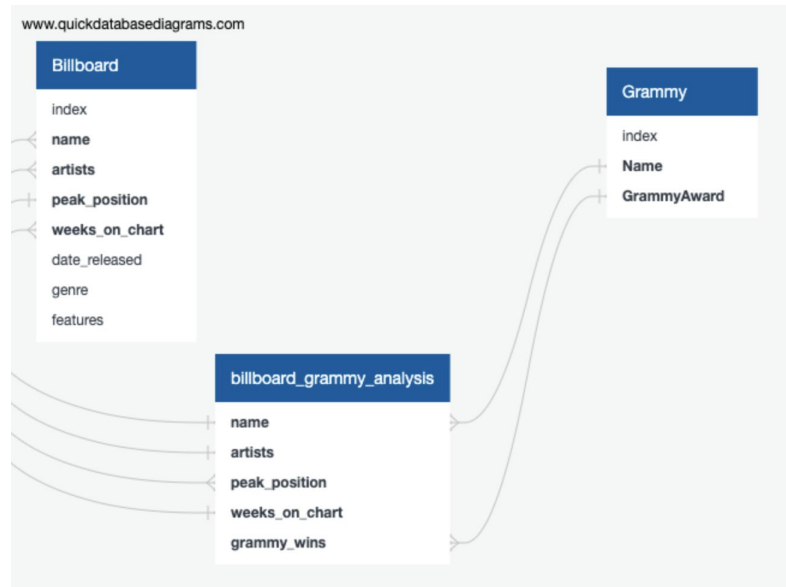
Data Exploration



- Peak Position on Billboard Chart
- Grouped categories based on simple buckets
 - A - Greater than or equal to 90
 - B - Greater than or equal to 80
 - C - Greater than or equal to 70
 - D - Greater than or equal to 60
 - E - Greater than or equal to 50
 - F - Greater than or equal to 40
 - G - Greater than or equal to 30
 - H - Greater than or equal to 20
 - I - Greater than or equal to 10
 - J - Less than 10
 - NA - Not ranked
- Initial results showed some correlation between peak position on chart and a Grammy win ($r = 0.14$)

Database Design

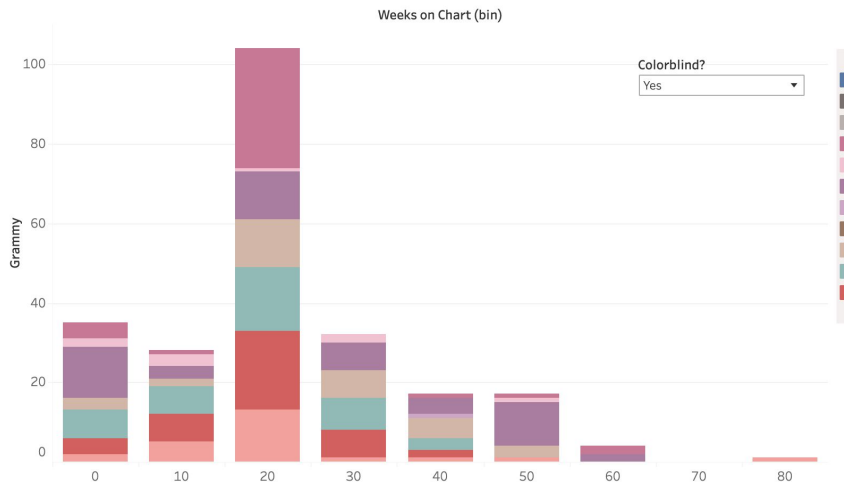
- Created ERD
- Finalized Postgres as the database.
- Used Python to clean Billboard and Grammy CSVs
- Loaded CSVs into Postgres database tables
- Joined Billboard and Grammy tables to get one complete dataset.



Used an iterative design approach

Tableau Dashboard

Genre as interactive element



- Tool Used: Tableau
- [Dashboard](#)
- The interactive chart shows the correlation between weeks on chart and Grammy win for a specific Genre. We can either look at a specific Genre or the consolidated view.
- Also, to help user who are color blind, we have added the color-blind view of the chart.
- Interactive features include genre filters

Machine Learning – Grammy Prediction

	Prediction	Actual
0	1	1
1	2	2
2	1	1
3	2	2
4	1	1
5	1	1
6	1	1
7	1	1
8	2	2
9	1	1
10	2	2

Machine Learning Model Choice

- Logistic Regression
 - Predicts binary outcomes
 - Used to help assess whether or not an artist that is on the Billboard Top 100 Chart will win a Grammy
- Benefits:
 - Simple to implement and make predictions for linear outcomes
 - Simple to understand, train, and update with new data to be used in the future
- Limitations:
 - Does not work with non-linear outcomes
 - Requires a large dataset
 - Prone to overfitting

Machine Learning – Grammy Prediction

Machine Learning Model In Action

- Feature Selection:
 - Dropped Variables: "weekly_rank", "writing_credits", "lyrics"
 - These variables are not informative for our MLM analysis.
 - Increased Accuracy Score
- Training and Testing:
 - X predicts y
 - X: input created by dropping "artists" and "name" columns
 - y: output taken from "GrammyAward" column
 - Use the train_test_split module to split X and y into training and testing sets
 - X_train, X_test, y_train, y_test
 - The model's prediction, y_pred, were compared with the actual values, y_test.
- Accuracy Score:
 - Assesses how well our Machine Learning Model Performs
 - **94.12%**

Results and Other Considerations

- **Original hypothesis:** Grammy winners can be accurately predicted based on Billboard Chart information
- **Null hypothesis:** Grammy wins do not follow Billboard chart positions
- Final result of machine learning model showed a 94.12% accuracy score
 - Conclusion from model that Grammy winners are likely predicted using current model.
- Dataset limitations - time on chart and peak position unavailable
- Committee based decision bias to data analytics based
- Multiple genre listed for individual song
- Additional information for later machine learning models
 - Genre impact
 - Release date in relation to Grammy awards
 - Location of release (US, UK)



Next Steps and Additions

- Automatic web scraping to add in weekly Billboard chart
- Use additional data sets and modern compilations of song ranking
- Expand Grammy and Billboard datasets to include all available
- Grammy Award category changes and additions
 - 1959 - 14 categories
 - 2021 - 84 categories



Questions?

