

Stat 165 Final Project

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1 Background Information

Billboard is recognized globally as a platform for tracking success in music for artists. Its charts take into account both commercial success and cultural impact. This metric tracks album sales, radio time, streaming data, and social media engagement and ranks influential artists on a weekly basis.

In recent years, SZA, Taylor Swift, and Drake have dominated the rankings, but this often changes with new and unexpected artists overcoming the top of the charts. Trends are often changing and this prediction will take into account new album drops, collaborations, industry cycles, etc. Artists like Bad Bunny and Morgan Wallen have recently made headlines and could end up on the charts. Our goal is to predict the top artist for the week of June 1st, 2025.

2 Question Statement

Who will be the Top Artist on Billboard for the week of June 1st, 2025?

3 Domain Knowledge

All three of us have a solid understanding of how the Billboard rankings work and each of us listen to music avidly which gives us a good amount of intuition on who is doing well in the music industry currently. We are also all up to date on upcoming artists and currently popular artists who plan on dropping music soon which is very important when it comes to determining who will dominate the Billboard Artist 100. We also all listen to a very large and diverse set of artists which gives us a lot of coverage in terms of genres and artists who are popular in those respective genres. All of this information we possess without doing any type of research makes this kind of forecast a very obvious pick for us since we already know so much about the subject.

4 Resolution Criteria

This forecast will resolve using the #1 artist listed on the Billboard Artist 100 chart dated June 1st, 2025, as published at: <https://www.billboard.com/charts/artist-100/>. If the chart is not published for that exact date (e.g., due to scheduling shifts), the forecast will resolve using the chart published closest to that date in Billboard’s regular weekly cadence.

If two or more artists are tied for #1, all tied artists will be considered correct resolutions. If the Artist 100 chart is discontinued before June 1st, 2025, and no comparable replacement is created, the forecast will resolve as “Unresolvable”. If the top artist is credited as a collaboration or group (e.g., “Drake & 21 Savage”), the group as a unit is considered the entity that resolves the forecast.

If an artist changes their stage name before the resolution date, they are considered the same entity (e.g., Kanye West and Ye). We assume Billboard continues operating and publishing charts in a recognizable format, and factors (e.g., major digital platform failures) do not prevent resolution.

5 Identifying Key Considerations and Building a Framework for Making the Forecast

One key consideration for this project was to emphasize using more recent data. Since artist’s positions on the charts tend to change relatively between each other, it is important to use data that is close to the date of June 1st, 2025. Research has shown us that artists don’t tend to move drastically in the charts unless there was a dramatic event. Because of this reason, we emphasized recent data compared to data from years prior.

We also were keen to not only focus on the computer simulation of our project. While the computer simulation section was useful in assigning probabilities and determining the validity of an event (such as an artist topping the charts), there are a lot of conclusions we can’t simulate easily in the data. For example, new entrants that have gained popularity quickly are unlikely to consistently stay at the top of the charts. We can see this in the case of Ghost.

Our framework for building a forecasting model is to run a computer simulation to get the most recent chart data from the past year and the past 2 months. With this data, we will determine the associated probabilities of each artist becoming the top artist for the week of June 1st.

Then, we will tweak our artist predictions and associated probabilities with the analysis we gathered from our reference classes, fermi estimation, and cognitive biases.

6 Link to Code and Simulations

https://colab.research.google.com/drive/1VRxaaW6Lv_4cRI54aAgWRQAE3dSNIcy4#scrollTo=ca8eb6f9-2ea8-400d-b414-90b0a3dc3eef

7 Forecasting Skills

7.1 Reference Classes

Below are the reference classes we have defined for the top artist on Billboard for the week of June 1st, 2025. We have defined several different reference classes because this question intrinsically asks us to analyze many different factors related to artists such as potential album release dates, seasonal patterns, and current trends. Billboard’s legend website <https://www.billboard.com/billboard-charts-legend/> explains Billboard’s rationale for their charts. This includes a mix of sales data, airplay from radio stations, and streaming data. The sales data is compiled by Luminate and considers more than 90% of the US music retail market. Radio charts are tracked by Mediabase and considers over 140 markets, while streaming data uses leading music services to track popularity. Notably, much of the data is collected solely within the United States. Because of this, we base our analysis on United States based audiences. We have listed our reference classes and reasonings below.

7.1.1 Current Billboard Artist 100 Chart Leaders

As of Friday May 2nd, and for the week of May 3rd, 2025, the top artist of the Billboard Artist 100 is Morgan Wallen. He is followed by Kendrick Lamar at the second position and Sabrina Carpenter at the 3rd position. Artists following the top 3 include SZA, Doechii, Chappell Roan, and Lady Gaga. When checking the billboard top 100 artist charts on April 17th, 2025, we saw that Morgan Wallen also dominated the charts then. Using the billboard website <https://www.billboard.com/charts/artist-100/> we can see that Morgan Wallen has spent 18 weeks at the number 1 position and has been on the top 100 charts for 320 weeks. Using the same website, we see that Kendrick Lamar was also in the number 2 spot last week with a peak position of topping the charts. He has spent a total of 468 weeks on the charts. Both Morgan Wallen and Kendrick Lamar seem like top contenders for the top of the Billboard Artist 100 Charts.

As of Wednesday May 7th, the charts have changed. We see that Ghost is now dominating the charts at the #1 position, as a re-entry. Last week, Ghost was not on the Billboard Artist 100 charts and they have spent a total of 12 weeks on the charts, at any position, throughout their career. The Billboard organization <https://www.billboard.com/music/chart-beat/ghost-skeleta-first-number-one-album-billboard-200-chart-1235961993/> labeled this as the first hard rock album to be number 1 in more than four years. This article states that “of the album’s starting sum, 89% was driven by traditional album sales”. The article also mentions that “the last hard rock album at Number 1 was AC/DC’s Power Up”, which only spent one week on the charts at the number one position. Similarly, the last rock, or alternative, album that led the charts was Coldplay’s Moon Music which also only spent one week on the charts. Using past trends of rock albums, we do not believe Ghost will continue to top the charts by June 1st, 2025. We are more confident in artists who remained in top positions for a long period of time such as Morgan Wallen and Kendrick Lamar.

7.1.2 Artists with the Most Youtube Streaming

Billboard rankings take into account how often an artist is streamed. While Billboard does state that it uses “leading online music services,” their sources of streaming aren’t public. We believe it is valid to assume that Billboard takes into account Youtube streaming - one of the most popular streaming platforms both in the United States and worldwide. To that extent, we analyzed Youtube’s weekly top artists for the weeks preceding June 1st, 2025.

We do note that this reference class tracks international streaming, while Billboard emphasizes popularity within the United States. For the week of April 25th - May 1st, 2025, the top 5 most popular artists in order were YoungBoy Never Broke Again, Bad Bunny, Kendrick Lamar, Drake, and Morgan Wallen. For the preceding week (April 18th- April 24th, 2025), the top 5 artists were the same, but with a different ordering: Kendrick Lamar, YoungBoy Never Broke Again, Bad Bunny, Morgan Wallen, and Drake. For the week of April 11th - April 17th, 2025, the artists and ordering were the same as the following week, with the exception of Drake and Peso Pluma overtaking Morgan Wallen.

As we can see, 5 artists are consistently repeated across the rankings. Looking at the previous few months of 2025, we see Kendrick Lamar, Bad Bunny, and YoungBoy Never Broke Again consistently dominating the top 5 positions. We believe that these artists’ success will continue in the following month in terms of streaming data. However, we do put more of an emphasis on current streaming data over previous streaming data. With that in mind, we believe the data indicates that the top contenders for the top Billboard artist for the week of June 1st, 2025 could be: Kendrick Lamar, YoungBoy Never Broke Again, Morgan Wallen, Bad Bunny, or Drake.

We will note that YoungBoy Never Broke Again does not currently (as of May 2nd, 2025) appear on the Billboard Top 100 charts and both Bad Bunny and Drake are positions 27 and 13 respectively, on the downwards trend. We also note that while Bad Bunny is extremely popular in the United States, his following is primarily international. Billboard tends to track data within the United States. If we were to combine reference classes, we would primarily consider Kendrick Lamar and Morgan Wallen as top contenders.

7.1.3 Upcoming and Current Tours

New Albums and major tour dates often trigger surges in the Billboard Artist 100 charts. For example, Ghost’s recent album drop (on April 25th, 2025) triggered their rise to the top of the charts. With that in mind, we consider artists that have announced upcoming releases and tours. Of the artists that we have considered in the previous reference classes, Bad Bunny has announced a tour <https://www.billboard.com/music/latin/bad-bunny-debi-tirar-mas-fotos-world-tour-dates-1235962570/>. Notably, Bad Bunny’s tour does not include any locations inside the United States. While we believe that Bad Bunny’s tour announcement will drive up streaming for his music globally, we don’t believe that Bad Bunny’s streaming within the United States will drastically change. This is due to the lack of United States tour locations. Since Billboard only considers United States streaming, we don’t believe that Bad Bunny will dramatically move up in the charts due to this tour announcement.

We also consider artists who are currently on tour. Of the artists that we have discussed

in previous reference classes we see that both Kendrick Lamar & SZA and Morgan Wallen are on tour which highly impacts their engagement. Kendrick Lamar and SZA are currently on a combined tour. Anecdotally, all of our group members have heard much of the continued excitement of this tour. The concert that kicked off this tour was in Minneapolis and was the “highest grossing hip-hop show in music history” according to the Inquirer <https://www.inquirer.com/arts/kendrick-lamar-sza-concert-philadelphia-20250506.html>. Morgan Wallen’s previously announced tour kicks off on June 20th in Houston. We believe that as the tour date approaches, Morgan Wallen’s engagement will skyrocket, which is often the trend with artists going on tour. Morgan Wallen also builds anticipation around June 1st, 2025 by heading to London on May 28th for a coveted one-night-only concert <https://www.billboard.com/music/country/morgan-wallen-london-concert-announcement-1235964242/>. However, since this concert is in London and due to our focus inside the United States, we don’t believe this will dramatically affect United States streaming.

Drake, YoungBoy Never Broke, Ghost, and Chappell Roan are not currently on tours and have not announced upcoming tours. Sabrina Carpenter does have an upcoming performance at Lollapalooza in July and is finishing up her Short ’N’ Sweet tour starting in October. She is currently not performing and does not have plans to consistently perform until the resumption of her tour in October which does not indicate a rise in popularity around May and June.

Other Notable Artists that are currently on tour are Beyonce, Dua Lipa, and Olivia Rodrigo. However, as neither of them are on the Billboard Artist 100 charts, we do not consider them in our forecast. Similarly, Halsey has recently announced a tour, but since she is also not on the charts, we do not consider her a top contender. While Billie Eilish is both currently on tour and is number 8 on the Billboard Artist 100 rankings, the remainder of her tour is not within the United States. As a result, we do not anticipate changes in her streaming and do not strongly consider her as a top contender, although she does show promise.

7.1.4 Reference Class Conclusion

From the analysis we conducted on the reference classes, we believe that the top 2 contenders for Billboard’s Artist 100 are Morgan Wallen and Kendrick Lamar. This is due to their continued dominance on the charts for the past few weeks, their dominance in streaming numbers, and their upcoming/current tours.

7.2 Cognitive Biases

Throughout the process of this forecast we have succumbed to a couple of cognitive biases which are hard to avoid. The first of which is that although we do listen to a large range of artists and genres, we do not listen to all of them. This means that our knowledge of genres and artists only goes so far, for example none of us listen to heavy metal so we would generally not know anything about popular heavy metal bands or upcoming tours/albums from heavy metal bands that could be very popular. While this is true we are lucky that we do listen to most popular genres and artists which means that those we do not listen to have a very low chance of topping the charts since typically artists that are known amongst most of the

population are those who top the chart. What this means is that without extensive research into music genres that we are not familiar with, it is very difficult to assess the impact and importance of these genres and artists when it comes to the final forecast. Luckily since we have the internet, finding this kind of information is not as difficult as it would be without it, but it still requires a lot of in depth research.

The second cognitive bias that we fell victim to was overconfidence. Considering that each of us has a large well of knowledge when it comes to music, it is reasonable to assume that we were very confident when it comes to thinking who could be the artist that tops the chart. This overconfidence blinds us and does not allow us to consider other other options that could be valid when forecasting who will top the Billboard Artist 100. If we were to redo a forecast like this we would pay more attention to other artists who may not be the most popular to us but are to others because they still hold value that can be taken away from the main artists who we think might top the chart. One way that we could have avoided this is by taking a step back and really understanding what genres are the most popular and finding relevant artists/songs that may be going viral at the time. In doing this we would be able to fully assess all genres and understand the importance of each one in regards to popularity among the general population since at the end of the day that is what allows an artist to appear at the top of the chart.

7.3 Fermi Estimation

As we discussed before, due to the dynamic nature of the Billboard Top Artist, we cannot rely solely on the computer simulations. To add another layer of reasoning, a Fermi estimate provides further context as we determine which artist is most likely to be placed at #1 by June 1st of this year.

Question: Who will be the Top Artist on Billboard for the week of June 1st, 2025?

Assumptions: From our simulations as well as our reference classes, the strongest contenders for the top artist include Morgan Wallen, Kendrick Lamar, and SZA, with Wallen being the strongest. However, we've also seen unpredictable shifts — for example, Ghost recently reached #1 despite limited prior appearances, reminding us that volatility in chart performance is common.

Estimate: For this Fermi estimate, we'll focus on Morgan Wallen and estimate the likelihood that he will be the #1 artist on June 1st. Three main factors that could influence this include:

- **Wallen maintains strong performance over the next few weeks**

He's been #1 repeatedly. From our simulations, we see consistency, but also some fluctuation, especially after Ghost peaked at #1 this week. Additionally, major upcoming performances can increase streams for Wallen.

Estimated probability: 0.85

- **No other major artist overtakes him**

Kendrick Lamar and SZA are close competitors and may release new content. However, their performance has not been as strong or consistent as Wallen's. Another consideration is that as we approach summer, artists will begin releasing singles in

hopes of being the next summer hit, and apps such as TikTok can propel songs and artists to the top quickly.

Estimated probability: 0.6

- **No surprise breakout artist disrupts the top ranking**

Ghost's sudden rise shows how new viral success can shift the charts. However, this seems a bit less likely with the little time left until June 1st.

Estimated probability: 0.8

Multiplying these probabilities together, Morgan Wallen has a 40.8% chance of being ranked #1 on Billboard during the week of June 1st, 2025. This aligns closely with our simulations and strengthens our confidence that he is a leading candidate, though not a guaranteed outcome.

8 All Things Considered Forecast

After examining both quantitative and qualitative factors, including historical chart performance, touring schedules, Python simulations and our Fermi estimate, we predict that Morgan Wallen is the most likely artist to top the Billboard Artist 100 for the week of June 1st, 2025. However, due to the volatile nature of the charts and music industry, there is a level of uncertainty present in this forecast.

Our simulations modeled both recent performance and structural instability, such as a breakout artist suddenly jumping spots. In those simulations, Wallen frequently emerged as the top artist, though other contenders like Kendrick Lamar also showed up consistently.

We also incorporated reference class forecasting based on trends from recent months. Artists like Wallen and Kendrick Lamar have maintained chart longevity, high streaming numbers (such as on YouTube), and sustained public engagement. Ghost, despite a recent #1 debut, does not have the same historical presence or streaming momentum to maintain that position through June.

Additionally, our Fermi estimate provided an intuitive probability breakdown of Wallen staying on top, with a 40.8% chance that he would be #1 by June 1st. While cognitive biases like overconfidence and genre familiarity may have shaped some of our assumptions, we attempted to be holistic in our analysis and account for both biases and the volatility of the charts.

After combining simulations, analyzing music trends and artist momentum, and probabilistic reasoning, we forecast that Morgan Wallen is the most probable top artist for the Billboard Artist 100 on the week of June 1st, 2025, with an estimated probability of between 30 - 40%, based off of both the simulations and Fermi estimate. Kendrick Lamar seems to be a possible challenger, but without major surprise events in the coming weeks, Wallen appears to be in the lead. We believe that Kendrick Lamar has around a 15% probability of being the top artist for the week of June 1st. This is due to the fact that he has consistently been right behind Wallen for the past few weeks, his recent success and popularity with his tour and recent hits, and our simulation's confidence that he can potentially lead the charts. Although we don't believe that it is likely that Kendrick Lamar will shoot to the top of the

charts without a major album release or controversy, we do believe he has more potential than most other artists to compete with Wallen for first place.