# Deloitte.



## Analyzing Spotify Reviews with NLP

- **HOPE MILLER**

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*since* 1845

# Purpose

## 1

### Background

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- As of today, Spotify has over 27.2 million reviews on the Google Play app store and 25 million on the Apple App Store
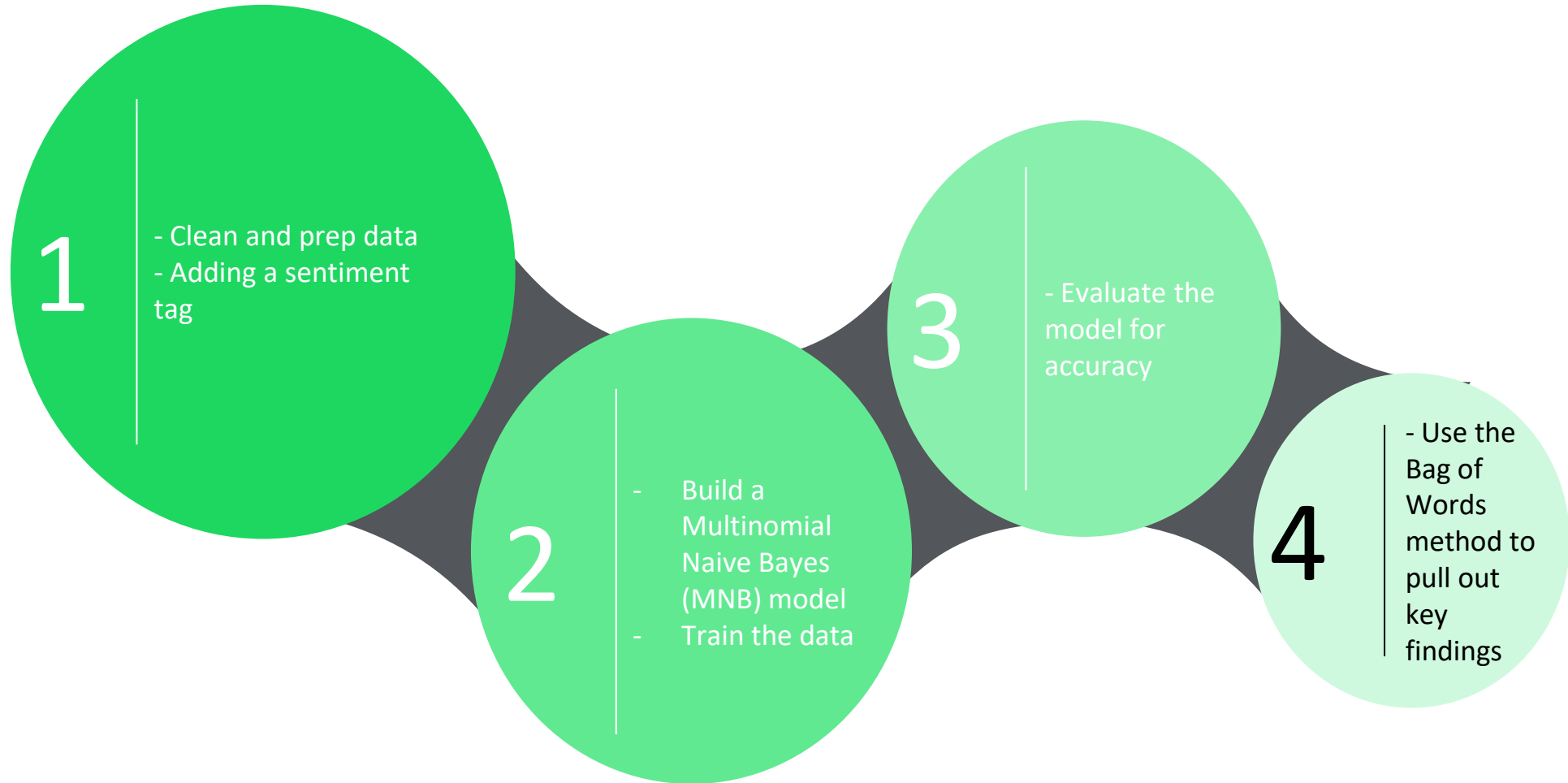
## 2

### Goal

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- Develop a way to quickly analyze customer satisfaction and get customer insight related to the app.

- Bugs and applications errors may also be uncovered through reviews.

## 3

### Approach

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- Over 61,000 reviews were scraped off the Google Play app store

- Looking at what the customers say in their ratings gives un-bias insight into how Spotify is doing, in terms of customer satisfaction.

# Method

**1** - Clean and prep data
- Adding a sentiment tag

**2** - Build a Multinomial Naive Bayes (MNB) model
- Train the data

**3** - Evaluate the model for accuracy

**4** - Use the Bag of Words method to pull out key findings

# Results: MNB Model

- **Ratings: 67% accuracy**

| | precision | recall | f1-score | support |
|---|---|---|---|---|
| 1 | 0.60 | 0.89 | 0.72 | 9987 |
| 2 | 0.62 | 0.25 | 0.35 | 4021 |
| 3 | 0.63 | 0.24 | 0.35 | 3845 |
| 4 | 0.53 | 0.35 | 0.43 | 4423 |
| 5 | 0.79 | 0.88 | 0.83 | 12370 |
| | | | | |
| accuracy | | | 0.67 | 34646 |
| macro avg | 0.64 | 0.52 | 0.54 | 34646 |
| weighted avg | 0.67 | 0.67 | 0.64 | 34646 |

- **Sentiment Analysis: 80% accuracy**

| | precision | recall | f1-score | support |
|---|---|---|---|---|
| negative | 0.75 | 0.89 | 0.81 | 14008 |
| neutral | 0.62 | 0.16 | 0.26 | 3845 |
| positive | 0.86 | 0.87 | 0.87 | 16793 |
| | | | | |
| accuracy | | | 0.80 | 34646 |
| macro avg | 0.75 | 0.64 | 0.65 | 34646 |
| weighted avg | 0.79 | 0.80 | 0.78 | 34646 |

# Results: Key Findings

**Positive Reviews:**
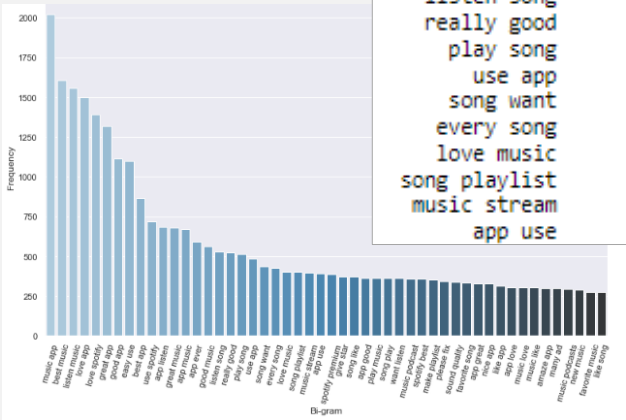
| | | | |
|---|---|---|---|
| music app | 2021 | spotify premium | 385 |
| best music | 1608 | give star | 374 |
| listen music | 1557 | song like | 371 |
| love app | 1501 | app good | 363 |
| love spotify | 1391 | play music | 363 |
| great app | 1318 | song play | 361 |
| good app | 1115 | want listen | 361 |
| easy use | 1099 | music podcast | 359 |
| best app | 867 | spotify best | 359 |
| use spotify | 719 | make playlist | 353 |
| app listen | 683 | please fix | 344 |
| great music | 680 | sound quality | 339 |
| app music | 668 | favorite song | 334 |
| app ever | 590 | app great | 331 |
| good music | 565 | nice app | 329 |
| listen song | 527 | like app | 314 |
| really good | 526 | app love | 306 |
| play song | 512 | music love | 304 |
| use app | 487 | music like | 303 |
| song want | 437 | amaze app | 299 |
| every song | 426 | many ad | 297 |
| love music | 403 | music podcasts | 294 |
| song playlist | 401 | new music | 291 |
| music stream | 398 | favorite music | 276 |
| app use | 393 | like song | 275 |

The app overall, vast song selections, Spotify Premium, and podcast

**Negative Reviews:**
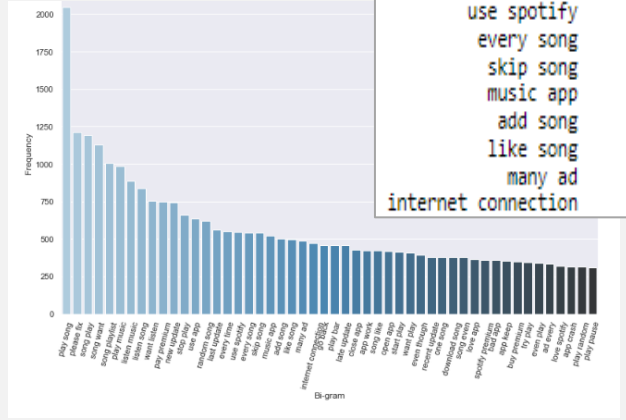
| | | | |
|---|---|---|---|
| play song | 2045 | go back | 458 |
| please fix | 1213 | play bar | 456 |
| song play | 1192 | late update | 456 |
| song want | 1127 | close app | 428 |
| song playlist | 1005 | app work | 420 |
| play music | 983 | song like | 420 |
| listen music | 886 | open app | 417 |
| listen song | 839 | start play | 413 |
| want listen | 751 | want play | 408 |
| pay premium | 746 | even though | 394 |
| new update | 741 | recent update | 380 |
| stop play | 660 | one song | 378 |
| use app | 637 | download song | 378 |
| random song | 622 | song even | 377 |
| last update | 562 | love app | 364 |
| every time | 551 | spotify premium | 358 |
| use spotify | 548 | bad app | 357 |
| every song | 542 | app keep | 353 |
| skip song | 540 | buy premium | 347 |
| music app | 521 | try play | 343 |
| add song | 500 | even play | 337 |
| like song | 498 | ad every | 335 |
| many ad | 484 | love spotify | 319 |
| internet connection | 470 | app crash | 316 |
| | | play random | 315 |
| | | play pause | 311 |

Paying for Spotify Premium, ads, not being able to skip songs, song suggestions, and new updates