Visualization Design
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Visualization 1: Genre Evolution Over Time

This multi-line chart was created using D3 to visualize the evolution of music genres over the course of 2020 and 2021. A line chart was chosen because it is ideal for displaying trends and changes over time, allowing viewers to clearly track how each genre's popularity rose or fell throughout the pandemic period. The x-axis displays time in monthly intervals while the y-axis shows the number of songs for each genre, making it easy to compare both the magnitude and trajectory of different genres. Each genre is represented by a distinct colored line, enabling viewers to quickly differentiate between categories and compare how multiple genres evolved simultaneously. This color encoding also allows users to identify which genres maintained stable streaming counts versus those that experienced significant growth or decline. The continuous line format emphasizes the temporal progression, making patterns like Pop's steady incline peaking around July 2021 and subsequent decline immediately visible.

Visualization 2: Energy vs Mood of Songs by Genre

This scatter plot was created using Altair to visualize the relationship between energy and mood (valence) of songs during 2020-2021. A scatter plot was chosen because it effectively reveals correlations and patterns between two continuous variables, allowing viewers to see how energy and mood relate across thousands of tracks. Each point represents a song, with its position determined by energy on the x-axis and mood on the y-axis. Genres are distinguished through color encoding, making it easy to identify whether certain genres cluster in specific areas of the energy-mood space. For the interactions, radio buttons allow users to isolate individual genres, reducing visual clutter and enabling focused analysis of where specific musical categories fall on the energy-mood spectrum. Additionally, a tooltip interaction lets users hover over any point to reveal detailed information including the track name, artist, macro genre, energy, and valence values.

Visualization 3: Top Hits By Region

This interactive bar chart was created using Altair to visualize the top streamed tracks across six global regions: Brazil, United States, United Kingdom, Japan, India, and Global charts. A horizontal bar chart encoding was chosen because it allows users to easily compare differences in streaming counts by observing bar lengths. The x-axis displays the number of streams, increasing in intervals of 20 million, while the y-axis shows the track names sorted in descending

order by popularity. From this visualization, we can observe significant regional variation in music preferences, certain songs achieved massive success in specific markets while others resonated globally. For the interaction, users can select different regions from the dropdown menu to filter and compare top hits across all six markets. Additionally, hovering over any bar reveals detailed information including the full track name, artist name, total number of streams, and number of weeks the song appeared on the chart.

Visualization 4: Regional Music Preferences

This radar chart was created using Plotly to compare audio characteristics of popular music across the same six regions: Brazil, Global, India, Japan, United Kingdom, and United States. A radar chart was chosen because it effectively displays multivariate data, allowing users to compare multiple audio features, energy, danceability, tempo, acousticness, and valence, simultaneously across different regions. The polar coordinate system with axes radiating from the center makes it easy to see the "shape" of each region's musical profile at a glance, while the semi-transparent polygon fills allow for visual comparison of overlapping regions. Values were normalized to a 0-1 scale to ensure all features could be compared on the same axes regardless of their original units. For the interaction, clickable region buttons were implemented at the bottom of the chart so users can isolate individual regions or view all regions simultaneously, making it easier to focus on specific comparisons without visual clutter. Additionally, hovering over the chart displays the exact values for each audio feature, providing precise data when needed.

Visualization 5: Mood Trends During COVID Era

This stacked area chart was created using Plotly to track the evolution of music mood categories, Negative, Neutral, and Positive, throughout the COVID-19 pandemic from January 2020 to late 2021. A stacked area chart was chosen because it effectively shows both the total volume of tracks over time and the proportional breakdown between mood categories, making it easy to observe how the composition of streamed music shifted during the pandemic. The x-axis displays time in monthly intervals while the y-axis shows track count, with distinct colors (red for Negative, purple for Neutral, and green for Positive) clearly differentiating each mood category. Vertical dashed annotation lines were added to mark key pandemic events, "Pandemic Declared" and "Vaccine Rollout", providing important contextual reference points for interpreting the trends. For the interaction, users can hover over any point to see exact track counts for each mood category at that specific time, and the Plotly toolbar allows users to zoom, pan, or download the chart for further analysis.