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**Project Website Link:** [**https://eminekupa.github.io/DS4200Project/index.html**](https://eminekupa.github.io/DS4200Project/index.html)

**Design of Visualization Explanations –**

1. Distribution Channels:

* This bar plot was intended to uncover the variation in cancellation rates through booking channels without overly simplifying the visualization for viewers. We used a sorted bar order (top-to-bottom by highest to lowest cancellation rate) to prioritize attention towards the most at risk for volatility. First, all the bars are rendered as identical blue colors for consistency of look. A rollover hover interaction tailored in orange color helps the user differentiate and identify specific segments. We used clear labeling of axes, chart title, and percentage scaling on the Y-axis for ease of interpretation. Overall, the design strikes a balance between interactivity and legibility such that users can contrast channel cancellation rates simply immediately and easily understand the patterns.

1. **Guest Loyalty:**

* This visualization explores how guest loyalty influences cancellation behavior across Mediterranean countries from 2015-2017. By comparing cancellation rates between first-time (solid lines) and repeat guests (dashed lines) in Spain (red), France (blue), and Italy (green), we reveal distinctive patterns that hotel managers can leverage for revenue optimization. The interactive time-range selector and slider enable precise period analysis, while consistent color-coding and line styles create immediate visual contrast between guest types. This design approach emphasizes the "loyalty advantage" where repeat guests consistently demonstrate significantly lower cancellation rates—particularly pronounced in Spain, where new guests cancel 30-40% of bookings while repeat guests maintain rates below 10% in most months.

1. Geographic Analysis:

* This geographic visualization reveals distinct cancellation patterns across Mediterranean hotel markets through an intuitive dual-map approach. Using proportional bubbles with high-contrast colors, it immediately highlights the significant difference between city and resort hotel cancellation rates—with city properties consistently showing higher values (orange bubbles) compared to resort destinations (blue bubbles). Italy demonstrates the most dramatic contrast (35.40% vs. 17.43%), while interactive filters for travel purpose and season enable deeper analysis of these regional variations. The visualization's side-by-side presentation facilitates instant comparison, while the consistent country color scheme (Spain: red, France: blue, Italy: green) maintains visual coherence across the dashboard, making geographic patterns in cancellation behavior immediately apparent.

1. **Demographics:**

* For our Demographics analysis, we wanted to hone in on how price might influences per the specific type of traveler (solo, family, or couple). The way we felt would be a best representation of this was if we utilized the Average Daily Room Rate (ADR) – which is representative of the price that guests have to pay – and to aggregate it to a monthly level. After this aggregation, we wanted to plot it over all monthly data in the dataset to be able to see apparent trends. Next, another visualization would be added to show how different traveler group types cancelled per the specific time period; we wanted to hone in on each group’s percentage of the total amount, to indicate prevalency/significance. After this, we wanted to include an interactive element in this visualization by allowing users to select filters, perhaps during price spikes or troughs, which will allow them to assess cancelation rates (per traveler type) for different time periods. This is an effective feature of this visualization, as it allows the user to potentially see nuances in the data if they select a smaller time period; however, it’s beneficial to our conclusion because, after doing so, one could see that couples consistently have the highest cancellation rates.

1. Market Segments:

* This matrix visualization employs a heat map approach to reveal cancellation patterns across market segments and customer types in Mediterranean hotels. Using country-specific color scales (red for Spain, blue for France, green for Italy), the visualization enables precise identification of high-risk booking combinations—such as Spain's Aviation+Group segment (80%), Italy's Online TA+Transient customers (49%), and France's Groups+Transient combination (32%). Each cell contains both color-coding and exact numerical values for maximum clarity, allowing hotel managers to instantly recognize vulnerability patterns within their distribution strategies. The consistent matrix format facilitates cross-country comparison while highlighting regional differences: Spain's risk concentration in group bookings, France's moderate rates in online travel agencies, and Italy's severe issues with transient customers through online channels. This approach transforms booking data into actionable intelligence for targeted retention and revenue management strategies.