TECHNICAL REPORT ON LADA VEHICLE PORTFOLIO ANALYSIS

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**Presenter:** AKPOVETA BLESSING OGHO

**1. Introduction** Good day. Today, I'll be walking you through a data-driven analysis of the LADA vehicle portfolio, utilizing a dashboard that provides insights into various car brands including BMW, Kia, Mercedes-Benz, Hyundai, and Toyota. This analysis aims to shed light on key metrics related to car pricing, mileage, engine capacity, and other significant attributes across different transmission types and fuel types.

**2. Data Overview** The dashboard presents a comprehensive view of car analysis for several major brands within the LADA vehicle portfolio. Key metrics highlighted include:

* Sum of Total Car Price
* Average Car Engine Capacity
* Sum of Car Engine Horsepower (HP)
* Average Car Age
* Average Car Mileage

The data is segmented and visualized by Car Transmission (Manual, Automatic, CVT, Robot) and Car Fuel Type (Gasoline, Diesel, Hybrid).

**3. Dashboard Overview** The interactive dashboard provides a detailed breakdown of vehicle characteristics and performance across different brands:

* **BMW Analysis (Page 1)**
  + **Total Car Price:** Sum of Total Car Price for BMW is 5.24bnP.
  + **Engine & Mileage:** Average BMW Car Engine Capacity is 2.57, and Average BMW Car Mileage is 119.41K. The Sum of Car Engine HP is 769K, and the Average BMW Age is 8.39.
  + **Mileage by Transmission:** Average BMW Car Mileage by Car Transmission shows Automatic at 151K, Manual at 111K, and CVT at 769K.
  + **Price by Transmission & Fuel:** Total Car Price by Car Transmission: Automatic (4.5bnP), CVT (1.3bnP), Manual (0.8bnP), Robot (0.6bnP). Total Car Price by Car Fuel: Gasoline (5.5bnP), Diesel (1.2bnP), Hybrid (0.5bnP).
* **KIA Analysis (Page 2)**
  + **Total Car Price:** Sum of Total Car Price for KIA is 5.62bnP.
  + **Engine & Mileage:** Average KIA Car Engine Capacity is 1.80, and Average KIA Car Mileage is 110.80K. The Sum of Car Engine HP is 447K, and the Average KIA Age is 7.73.
  + **Mileage by Transmission:** Average Kia Car Mileage by Car Transmission shows different percentages for Automatic (31.01%), Robot (35.61%), and Manual (33.39%).
  + **Price by Transmission & Fuel:** Average Kia Price by Car Transmission: Robot (2.6M), CVT (2.4M), Automatic (1.9M), Manual (1.0M). Count of Car Brand by Car Fuel: Gasoline (2.9K), Diesel (0.2K), Hybrid (0.0K).
* **Mercedes-Benz Analysis (Page 3)**
  + **Total Car Price:** Sum of Total Car Price for Mercedes-Benz is 4.75bnP.
  + **Engine & Mileage:** Average Mercedes-Benz Car Engine Capacity is 2.77, and Average Mercedes-Benz Car Mileage is 147.85K. The Sum of Car Engine HP is 307K, and the Average Mercedes-Benz Age is 11.46.
  + **Mileage & Price by Transmission:** Data is presented for Manual, Automatic, and Robot transmissions for both mileage and price, but specific numerical values are not clearly visible in the provided image.
  + **Price by Fuel:** Data is presented for Gasoline, Diesel, and Hybrid fuel types, but specific numerical values are not clearly visible in the provided image.
* **Hyundai Analysis (Page 4)**
  + **Total Car Price:** Sum of Total Car Price for Hyundai is 4.48bnP.
  + **Engine & Mileage:** Average Hyundai Car Engine Capacity is 1.80, and Average Hyundai Car Mileage is 126.04K. The Sum of Car Engine HP is 380K, and the Average Hyundai Age is 8.95.
  + **Mileage by Transmission:** Hyundai Car Mileage by Car Transmission: Manual (146K), Automatic (103K), Robot (59K), CVT (0K).
  + **Price by Transmission & Fuel:** Hyundai Price by Car Transmission: Automatic (3.7bnP), Manual (0.7bnP), Robot (0.1bnP), CVT (0.0bnP). Hyundai Car Price by Car Fuel: Gasoline (3.7bnP), Diesel (0.7bnP), Hybrid (0.0bnP).
* **Toyota Analysis (Page 5)**
  + **Total Car Price:** Sum of Total Car Price for Toyota is 14.54bnP.
  + **Engine & Mileage:** Average Toyota Car Engine Capacity is 2.10, and Average Toyota Car Mileage is 171.04K. The Sum of Car Engine HP is 1M, and the Average Toyota Age is 14.46.
  + **Mileage by Transmission:** Avg Toyota Car Mileage by Car Transmission: Manual (251K), Automatic (169K), CVT (100K).
  + **Price by Transmission & Fuel:** Toyota Car Price by Car Transmission: Automatic (8.5bnP), CVT (5.4bnP), Manual (0.6bnP), Robot (0.0bnP). Toyota Car Price by Car Fuel: Gasoline (10.5bnP), Diesel (2.4bnP), Hybrid (1.7bnP).

**4. Key Observations and Insights**

* **Total Car Price Dominance:** Toyota exhibits the highest total car price at 14.54bnP, significantly outranking other brands in this portfolio. BMW and Kia follow with 5.24bnP and 5.62bnP respectively.
* **Mileage and Age Variation:** There's considerable variation in average car mileage and age across brands, reflecting diverse usage patterns and market segments. Toyota, for instance, has the highest average mileage (171.04K) and age (14.46).
* **Transmission Type Preferences:** Automatic transmission generally accounts for a substantial portion of total car prices across brands, notably in BMW (4.5bnP) and Hyundai (3.7bnP). CVT and Manual transmissions also hold significant portions for certain brands like Toyota.
* **Fuel Type Distribution:** Gasoline remains the predominant fuel type across all analyzed brands in terms of total car price. Diesel and Hybrid vehicles represent smaller, but notable, segments.
* **Engine Characteristics:** Engine capacity and horsepower vary, providing insights into the performance capabilities and types of vehicles offered by each brand within the LADA portfolio.

**Recommendations**

* Analysis should be done to determine the factors contributing to Toyota's high total car price to understand potential strategies for other brands in the portfolio.
* Further investigation should be done to know the market segments that prefer different transmission and fuel types to tailor production and marketing efforts.
* Further investigation should be done to know why older vehicles or those with high mileage, consider insights for maintenance, parts availability, or potential trade-in programs in order to know the vehicle lifecycle
* **Let’s** explore the reasons behind unusually high or low values in metrics like mileage for specific transmission types to identify potential issues or unique usage patterns.

**Conclusion**

This Lada Vehicle Portfolio Analysis provides a valuable high-level overview of key performance indicators across different car brands. By examining total car prices, mileage trends, engine specifications, and the distribution across transmission and fuel types, stakeholders can gain actionable insights to inform strategic decisions regarding product development, marketing, and sales within the automotive market. This data-driven approach facilitates a clearer understanding of the portfolio's strengths and areas for potential improvement.

**Introduction:** This dashboard presents an Alzheimer's Disease Overview, analyzing MRI brain scan data to provide insights into disease progression. It quantifies key metrics like Radiance Progression, Scan Disorder Level, and Central Brightness to assess neurological health. Visual representations of top diseased and healthy scans are included for comparative analysis. The report also delves into pixel intensity statistics and neuro-image entropy levels. Ultimately, it aims to support understanding and potential early detection of Alzheimer's disease through data visualization.

**Key Findings:** Radiance Progression is 74.67, with a Scan Disorder Level of 2.92, indicating significant deviations in diseased scans. Central Brightness averages 147.93, while Brightness Variation is notably high at 78.91 in analyzed images. The Disease Progression metric stands at 1.50, reflecting the severity captured in the data. Structural clarity decreases with disease severity, with 1067 NonDemented scans compared to 739 Moderately Demented scans. Neuro-Image Entropy levels cluster between 2.91 and 2.99 across different dementia stages.

**Conclusion:** The dashboard effectively illustrates various indicators of Alzheimer's disease progression through MRI data. High brightness variation and scan disorder levels are characteristic of diseased brains. Structural clarity diminishes significantly as dementia progresses from non-demented to moderately demented states. Pixel intensity and entropy provide quantifiable metrics that differentiate healthy from diseased scans. This analysis confirms that MRI data offers crucial insights for detecting and monitoring Alzheimer's disease.

**Recommendations:** Further investigate the correlation between high brightness variation and the early stages of Alzheimer's for predictive modeling. Utilize the structural clarity metric as a primary indicator for disease severity assessment and tracking. Develop predictive models integrating pixel intensity statistics and neuro-image entropy levels for automated diagnosis. Focus on augmenting the dataset with more balanced representations across all dementia stages to enhance model accuracy. Implement an alert system within the dashboard to flag scans with high disease progression indicators for immediate medical review.