Individual Task 1: Part 1

HISHIKESH PHUKAN (S4031214), RMIT University, Australia

Overleaf project URL: https://www.overleaf.com/read/mbhvghqfvspd#4e68df

1 Data Science Role

A Data Analyst position at Carsales on LinkedIn was posted, and the responsibilities and qualifications are presented below.

1.1 Job Description and Role Identification

The Data Analyst position was found at Carsales to fit my career goals in data science. The role is envisioned to conduct analyses to truly drive organizations into business education and decisions. SQL queries are part of the duties, probably designing data visualizations and interfacing with stakeholders on business requirements. It would be advantageous to be conversant with Python, Tableau, and Snowflake. The organization offers flexible working arrangements and a culture that values inclusivity and support.

    Job listing URL: https://www.linkedin.com/jobs/view/4278720962

1.2 Industry Context

Data science is used in the automotive industry and the online marketplace to optimize vehicle listings and personalize user experiences, to detect fraud, forecast demand, and improve advertising performance, essentially enabling smarter buying, selling, and marketing decisions through data analytics.

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1.3 Role Focus

The role mainly involves the production of insight with regard to data for business decisions. This is illustrated by responsibilities including writing SQL queries, preparing visualizations, and interacting with stakeholders for problem resolution, with emphasis placed on analysis and communication versus prediction.

[Word count: 42]

1.4 Value Creation

This position delivers value by transforming complex information into practical findings which guide business decisions while improving customer service and marketing effectiveness. Through its role the position delivers data-driven solutions that assist Carsales in enhancing platform operations and customer satisfaction across the competitive automotive market.

[Word count: 45]

Author's Contact Information: Hishikesh Phukan (s4031214), RMIT University, Melbourne, Australia, s4031214@student.rmit.edu.au.

1.5   Values and Culture Alignment

My values match with the inclusive and supportive culture at Carsales through my focus on teamwork together and continuous development and diverse perspectives. The organization demonstrates flexibility toward its staff and this creates a supportive workplace which enables both innovative ideas and team collaboration to grow.

[Word count: 46]

1.6   Diversity and Inclusion

This role requires the promotion of diversity alongside inclusion because it brings different perspectives which result in better data analysis and unbiased insights. The implementation of diverse customer needs through data-driven decisions leads to better solutions that enhance fairness and effectiveness within the automotive marketplace.

[Word count: 45]

1.7   Cover Letter

Please refer to the 99-appendix for the cover letter.

[Word count: 219]

2   Data Set

Vehicle Sales and Market Trends Dataset has detailed information on vehicles, such as make, model, trim, odometer readings, condition rating, sale price, and market value (MMR). It is made available in the CSV format with updates on a regular basis, so that data scientists can work with analyzing pricing strategies, predicting prices for a model, and analyzing consumer behavior in the automotive field.

   Dataset 1 URL: https://www.kaggle.com/datasets/syedanwarafridi/vehicle-sales-data

   The second one concerns general market trends to analyze sales by region, seasonal variations, and the strength of potential competitors. Utilizing historical sales supports effective forecasting and shall be useful in marketing, investment, inventory management, and supply-chain optimization in the automotive world.

   Dataset 2 URL: https://www.kaggle.com/datasets/missionjee/car-sales-report

   There has been a selection of datasets because they reflect the key activities of the Data Analyst. The first dataset allows for a deep dive into vehicle-level data to study price, condition, and trends. The second dataset allows for a wider perspective by providing insight into regional patterns, seasonal demand changes, and competitor performances. Both datasets therefore prove to be useful in developing data-driven strategies for pricing, marketing, and inventory planning. This directly feeds into that Carsales role, which is based on transforming complex vehicle and market data into actionable insights that help advance customer experience, optimize operations, and direct high-level business decisions in the automotive industry.

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3   Data Analysis

The two models, Decision Tree and LightGBM, largely agree on the main feature variables that determine a car's selling price variable: mmr, year, and odometer. That said, the two complementary sets of insights do reinforce each other,

showing they are not contradictory. LightGBM seems to assign slightly greater importance to mmr than the other two variables, because it can pick up on more complicated nonlinear interactions in data. Though using a single dataset gave this analysis, the convergence of insights gained via two different algorithms provides an additional measure of confidence in the results. The top features in LightGBM are illustrated in Fig. 1, which is in strong accordance with Decision Tree rankings and supports both models analyzing together on price indicators.
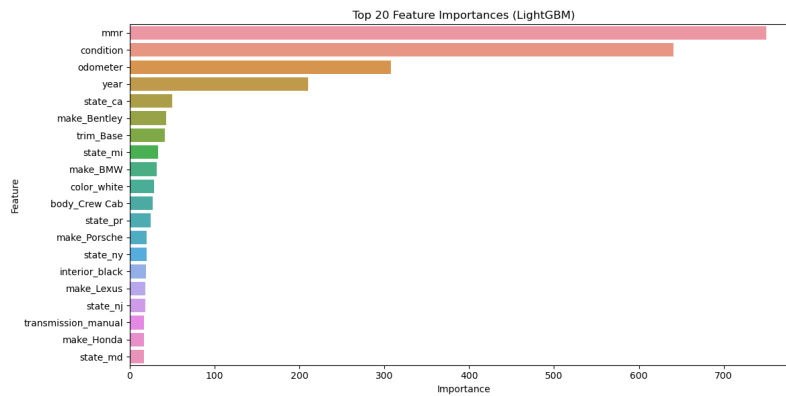

Fig. 1. Feature importance from LightGBM model

Model effectiveness was measured by the R^2, MAE, and RMSE metrics, common ones used for evaluating regression models. For Decision Tree, MAE was at 1,291.59, RMSE at 2,125.16, and R^2 at 0.9514. It performed better, though, with LightGBM, with its MAE standing at 925.43, RMSE at 1,606.05, and R^2 at 0.9723. Such metrics were selected because they describe the average face of error with the accuracy of the fifth model. As seen in Figure 2, the LightGBM is stronger on all the metrics when compared to Decision Tree, retesting the fact that the LightGBM possesses higher predictive accuracy and better generalization in estimating the selling price of cars.
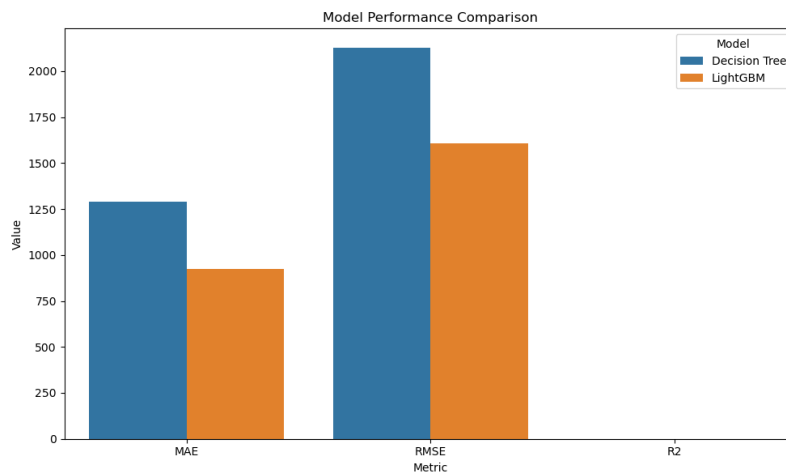

Fig. 2. Comparison of MAE, RMSE, and R^2 between Decision Tree and LightGBM models. LightGBM performs significantly better across all metrics.

Declaration of Use of Generative AI

I hereby declare that I have not used generative AI tools to complete this assignment.

Acknowledgments

Acknowledging those who have maintained these lands from time immemorial on which I live, learn, and work, I extend my respect to their Elders throughout time. I express gratitude to my fellow students, mentors, and teachers who have helped me with their continuous guidance and support on this journey.

References

A   Job Listing

- carsales.com Ltd. (2025, August 5). Data analyst – RedBook team [Job posting]. LinkedIn. https://www.linkedin.com/jobs/view/4278720962

B   Cover Letter

Hishikesh Phukan
05th August 2025

Hiring Manager
carsales.com Ltd
Melbourne, VIC

Dear Hiring Manager,

This letter serves to convey my enthusiastic application for the Data Analyst position at RedBook within Carsales. I bring both a passion for data-based decision processes and experience in developing end-to-end analytics solutions which makes me eager to work with one of Australia's most innovative technology companies.

During my current position as a Data Analyst I successfully created predictive models and interactive dashboards through Python Power BI and SQL to analyze complex datasets. I possess skills in API integration along with ETL pipeline automation and stakeholder collaboration for translating business requirements into meaningful visualizations. Through my data science education I acquired statistical modelling abilities which I now use to enhance vehicle pricing strategies and residual value forecasting.

The main attraction of this position stems from RedBook's dedication to advanced automotive data solutions. I want to develop expertise in your vehicle pricing system while helping to develop Instant Offer and FACTS+ tools. The value-based work environment combined with flexible work options and learning opportunities at Carsales creates the best career development path for me.

Thank you for considering my application. I would welcome the opportunity to further discuss how my skills and interests align with the goals of the RedBook team.

Warm regards,
Hishikesh Phukan