HACKTIV8

RevCheck

End-to-end revenue forecasting and monitoring program

RevCheck

Background

The RevCheck project started because forecasting models have been widely applied in businesses.[1] Using advanced LSTM technology, RevCheck aims to understand the patterns in sales data better, helping businesses make smarter decisions.

By combining data science and business know-how, RevCheck wants to change how companies forecast revenue, giving them the tools to grow steadily in today's fast-changing markets.

1. Seyedan, M., Mafakheri, F. Predictive big data analytics for supply chain demand forecasting: methods, applications, and research opportunities. J Big Data 7, 53 (2020). https://doi.org/10.1186/s40537-020-00329-2

Timeline

RevCheck Development

Preliminary Research

Researched on forecasting models, determined requirements and development timeline, searched for suitable dataset.

Phase 0

Day 1

Phase 1

Day 2 - 3

Prototyping

Built an ETL data processing and storing pipeline. Used the clean data to start developing LSTM model, monitoring dashboard, and EDA.

Implementation

Finished the forecasting model, dashboard, and EDA. Deploy model and EDA on HuggingFace.

Phase 2

Day 4

Phase 3

Day 5

Finalization

Re-evaluate and check the model, improved the dashboard's functions and aesthetics, finalize deployments, create presentation.

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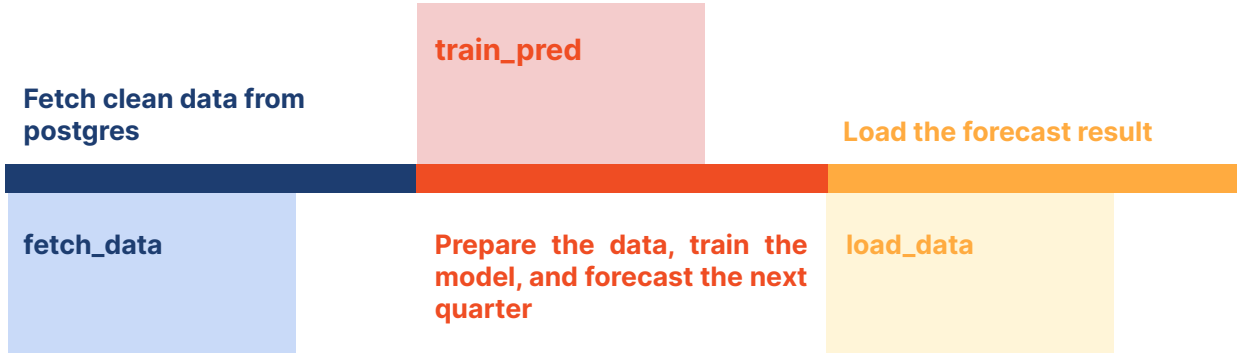
Pipeline

ETL DAG

Scheduled: Everyday

Pipeline

ML DAG



Scheduled: Every Week

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Modelling

Methods

LTSM (Long Term Short Memories)

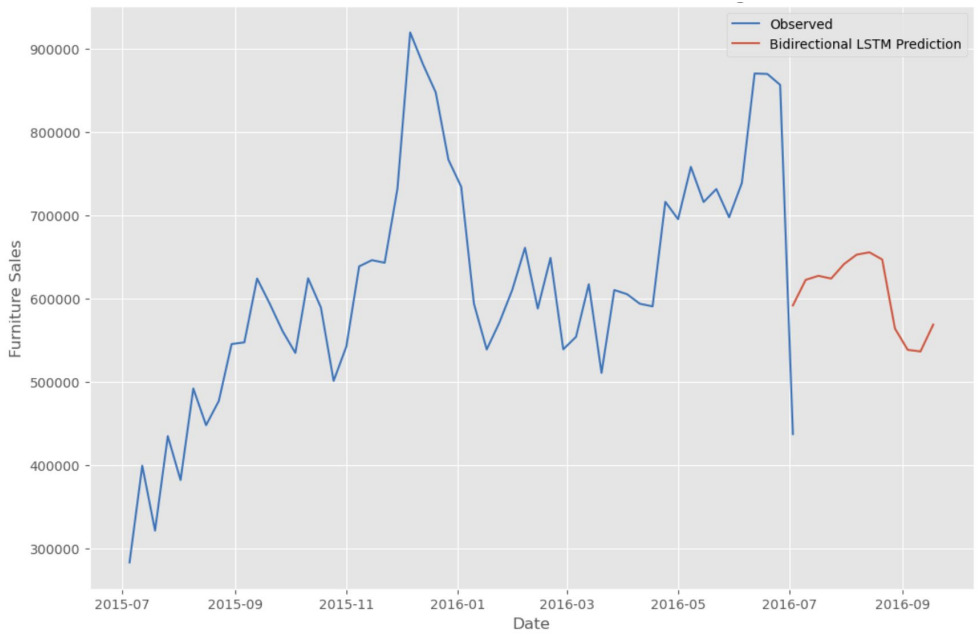
Forecasting bike sales using Time Series Analysis

Focus on weekly revenue

The goal is to accurately estimate future revenue trends to support business decision-making and strategic planning.

Modelling

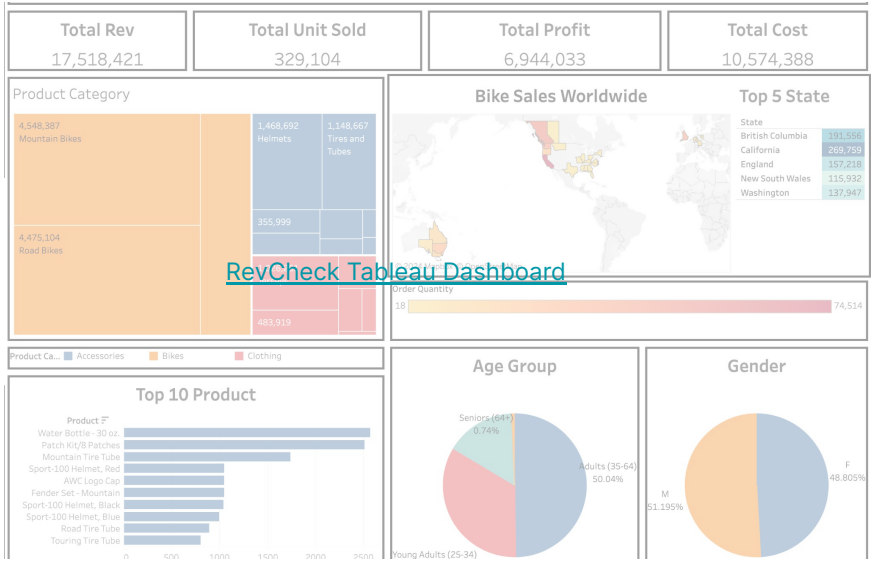
Result



MSE : 26068944535.5
RMSE : 161458.8
MAPE : 17.88%

The line representing the observed data closely follows the predicted values, indicating that the model's forecasts align well with actual sales data during this period. The seamless connection between the training and testing lines suggests that the model has successfully captured patterns in bike sales data and can provide accurate predictions consistent with the actual data.

Dashboard



RevCheck Tableau Dashboard

Forecasting

RevCheck Huggingface

RevCheck

Challenges

- **Missing Data:** Our dataset have a gap between July 2014 to July 2015, because of that we can only use the data from the last year (July 2015 to July 2016).

- **Limited Data:** Since we can only use one year timeframe of data, we fail to capture seasonal complexities that may emerge annually.

- **Limited Time:** As a first time facing this challenge, we realize that we still need time to explore further to gain more information.
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Success Story

Good things achieved during the project :

1. Invaluable knowledge: understanding about time series analysis.
2. The experience of collaborating with a solid and supportive team.
3. Successfully developed an interactive dashboard in Tableau, providing users with ease in accessing information and analyzing data.

RevCheck

Conclusion & Business Impact

1. **Improved Forecast Accuracy**
   More precise estimates of future sales, reducing the risk of errors in production planning.

2. **Inventory Optimization**
   More efficiently, reducing the risk of overstocking or understocking and optimizing capital expenditure.

3. **Enhanced Operational Efficiency**
   Help companies reduce unnecessary operational costs, improve efficiency, and strengthen their position in the market.

4. **Market Responsiveness**
   Allows them to maintain and increase their market share in dynamic business environments.

5. **Increased Profitability**
   By optimizing production planning, inventory management, and rapid response to market changes, companies can improve their overall profitability, generate higher profits, and solidify their position in the market.

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Thank You

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