Autos Code Assessment

Proprietário	 Victor Haddad
Tags	

AI-Powered Insights for Automotive Dealership Operations

Welcome to this project! In this repository, you will work with data from vehicles, parts, services, and inventory to build an AI model that provides valuable insights for a car dealership. The goal is to help stakeholders understand key trends, optimize inventory, and boost efficiency in their operations.

Objective

To develop an AI system that analyzes dealership data related to vehicles, parts, services and inventory.

Here are some sugestions for the project, but feel free to explore and experiment with different approaches:

1. Identify patterns in sales and service trends.
2. Forecast inventory needs and reduce operational inefficiencies.
3. Generate actionable insights to assist in decision-making for dealership management.
4. Deliver automated reports summarizing insights in natural language using OpenAI APIs.

Data Overview

We have prepared a set of CSV files and Jupyter Notebook data for this project. Below is a description of each dataset:

1. Current Parts Inventory (`estoque-atual-de-pecas.csv`)

Column Name	Description
Cod_Concessionaria	Dealership code
Cod_Filial	Branch code
Nome_da_Concessionaria	Name of the dealership
Nome_da_Filial	Name of the branch
Marca_da_Filial	Brand represented by the branch
Valor_da_Peca_em_Estoque	Total value of the part in stock
Quantidade_da_Peca_em_Estoque	Quantity of the part available
Descricao_da_Peca	Part description
Categoria_da_Peca	Part category
Data_de_Ultima_Venda_da_Peca	Last sale date of the part
Data_da_Ultima_Entrada_no_Estoque_da_Peca	Last restock date of the part
Peca_Esta_Obsoleta	Whether the part is obsolete (Yes/No)
Quanto_Tempo_a_Peca_Esta_Obsoleta	How long the part has been obsolete
Nome_da_Marca_da_Peca	Brand of the part
Codigo_da_Peca_no_Estoque	Stock code for the part

2. Current Vehicle Inventory (`estoque-atual-de-veiculos.csv`)

Column Name	Description
Cod_Concessionaria	Dealership code
Cod_Filial	Branch code
Nome_da_Concessionaria	Name of the dealership
Nome_da_Filial	Name of the branch
Marca_da_Filial	Brand represented by the branch
Custo_do_Veiculo	Vehicle cost
Marca_do_Veiculo	Vehicle brand
Modelo_do_Veiculo	Vehicle model
Cor_do_Veiculo	Vehicle color
Veiculo_Novo_ou_Semi_Novo	New or used vehicle
Tipo_do_Combustivel	Type of fuel
Ano_Modelo_do_Veiculo	Vehicle model year
Ano_Fabricacao_do_Veiculo	Vehicle manufacturing year

Column Name	Description
Chassi_do_Veiculo	Vehicle chassis number
Tempo_Total_no_Estoque	Total time in inventory
Kilometragem_Atual_do_Veiculo	Current mileage
Placa_do_Veiculo	License plate
Data_de_Entrada_do_Veiculo_no_Estoque	Date vehicle entered inventory

3. Service History (`historico-de-servicos-realizados.csv`)

Column Name	Description
Cod_Concessionaria	Dealership code
Cod_Filial	Branch code
Nome_Da_Concessionaria	Name of the dealership
Nome_Da_Filial	Name of the branch
Data_De_Realizacao_Do_Servico	Date of service
Quantidade_De_Servicos_Realizados	Quantity of services performed
Valor_Total_Do_Servico_Realizado	Total value of the service
Lucro_Do_Servico	Service profit
Descricao_Do_Servico_Feito	Description of the service
Secao_Que_O_Servico_Foi_Feito	Section of the service
Departamento_Que_Realizou_O_Servico	Department that performed the service
Categoria_Do_Servico	Service category
Nome_Do_Vendedor_Que_Vendeu_O_Servico	Service sales representative
Nome_Do_Mecanico_Que_Fez_O_Servico	Mechanic who performed the service
Nome_Do_Cliente_Que_Fez_O_Servico	Customer name

4. Sales History of Parts (`historico-de-vendas-de-peças.csv`)

Column Name	Description
Cod_Concessionaria	Dealership code
Cod_Filial	Branch code
Nome_da_Concessionaria	Name of the dealership
Nome_da_Filial	Name of the branch
Marca_da_Filial	Brand represented by the branch

Column Name	Description
Data_da_Venda	Date of the sale
Quantidade_Vendida	Quantity sold
Tipo_de_Transacao	Type of transaction
Valor_da_Venda	Sale value
Custo_da_Peca	Cost of the part sold
Lucro_da_Venda	Profit from the sale
Margem_da_Venda	Profit margin
Descricao_da_Peca	Part description
Categoria_da_Peca	Part category
Departamento_da_Venda	Department of the sale
Tipo_de_Venda_da_Peca	Type of part sale
Nome_do_Vendedor_que_Realizou_a_Venda	Seller's name who completed the sale
Nome_do_Comprador_da_Peca	Buyer's name
Cidade_da_Venda	City where the sale occurred
Estado_Brasileiro_da_Venda	Brazilian state where the sale occurred
Macroregiao_Geografica_da_Venda	Geographic macro-region of the sale

5. Sales History of Vehicles (`historico-de-vendas-de-veiculos.csv`)

Column Name	Description
Cod_Concessionaria	Dealership code
Cod_Filial	Branch code
Nome_da_Concessionaria	Name of the dealership
Nome_da_Filial	Name of the branch
Marca_da_Filial	Brand represented by the branch
Data_da_Venda	Date of the sale
Quantidade_Vendida	Quantity sold
Tipo_de_Transacao	Type of transaction
Valor_da_Venda	Sale value
Custo_do_Veiculo	Cost of the vehicle sold
Lucro_da_Venda	Profit from the sale

Column Name	Description
Margem_da_Venda	Profit margin
Marca_do_Veiculo	Vehicle brand
Modelo_do_Veiculo	Vehicle model
Familia_do_Veiculo	Vehicle family
Categoria_do_Veiculo	Vehicle category
Cor_do_Veiculo	Vehicle color
Veiculo_Novo_ou_Semi_Novo	Whether the vehicle is new or used
Tipo_do_Combustivel	Type of fuel
Ano_Modelo_do_Veiculo	Model year
Ano_Fabricacao_do_Veiculo	Manufacturing year
Chassi_do_Veiculo	Vehicle chassis number
Dias_que_o_Carro_Ficou_no_Estoque	Number of days the vehicle stayed in inventory
Tipo_de_Venda_do_Veiculo	Type of vehicle sale
Nome_do_Vendedor_que_Realizou_a_Venda	Seller's name who completed the sale
Nome_do_Comprador_do_Veiculo	Buyer's name
Cidade_da_Venda	City where the sale occurred
Estado_Brasileiro_da_Venda	Brazilian state where the sale occurred
Macroregiao_Geografica_da_Venda	Geographic macro-region of the sale

Expected Outputs

A better understanding of the dealership's performance.

Feel free to use your imagination to get the best insights from the data.

Some Tips:

- **Data Exploration**: Start by exploring the data to understand its structure, missing values, and potential outliers.
- **Data Cleaning**: Handle missing values, outliers, and inconsistencies.

- **LLM Integration**: Use the LLM to generate insights and recommendations. Langchain can be a great tool for this.
- **Visualization**: Streamlit can be used to create interactive visualizations.