**AI-Powered Market Trend Analysis for Amazon Products**

This project uses AI and data science techniques to analyse Amazon product data. It provides key insights into market trends, helping to inform business decisions related to inventory, marketing, and product development.

**Project Overview**

The project focuses on three main objectives:

1. **Sales and Seasonal Trends:** Analysing sales data from 2019 to 2022 to identify overall growth and seasonal patterns.
2. **Product Category Performance:** Evaluating which product categories are the most dominant and which show potential for growth based on sales and customer reviews.
3. **Predictive Modelling:** Using a time series model (Prophet) to forecast future sales and a regression model (Linear Regression) to analyse factors influencing product pricing.

**Methodology** The analysis followed a structured approach:

* **Data Acquisition:** The dataset was obtained from a public Kaggle dataset.
* **Data Preprocessing:** The data was cleaned to handle missing values, duplicates, and outliers. Categorical features were prepared for modelling using one-hot encoding.
* **Exploratory Data Analysis (EDA):** Visualizations were created to explore daily sales trends, category performance, and the relationship between price and reviews.
* **Modelling:**
  + **Prophet:** A Prophet model was trained on weekly sales data to forecast future sales and identify yearly seasonality.
  + **Linear Regression:** A Linear Regression model was built to predict prices and determine the importance of different product features.

**Installation & Setup**:

1. **Install the required libraries:**

pip install pandas matplotlib prophet scikit-learn seaborn kagglehub

*i.e kagglehub to download the dataset automatically.*

1. **Run the Jupyter Notebook:** The analysis and visualizations are contained within the market\_trend\_analysis\_amazon.py script. You can run this file directly or open it in a Jupyter environment.
2. **If viewing using Google colab no need to install some libraries.**

**File Structure**

* market\_trend\_analysis\_amazon.py: The main Python script containing all the code for data processing, analysis, and modelling.
* AI-Powered Market Trend Analysis.pptx: The presentation slides.
* Project Report.pdf: A detailed project report (2 pages).
* market\_trend\_analysis\_amazon.ipynb: The Jupyter Notebook version of the code.