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Project Title: Analysis of AI Search Trends Using Data Analytics

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2. Abstract

This project focuses on analyzing Artificial Intelligence (AI) search trend data to identify emerging topics, measure popularity, and understand public interest patterns. The dataset was collected in Excel format and contains 50 records with three key attributes: search query, search interest score, and percentage increase. The main objective of the project is to analyze AI-related keywords, identify rising trends, and extract actionable insights that support data-driven decision-making.

The analysis process involved data loading, data cleaning, exploratory data analysis (EDA), and visualization. Python libraries such as Pandas, NumPy, and Matplotlib were used for data processing and visualization, while Power BI was utilized to create interactive dashboards. Data cleaning techniques were applied to handle inconsistencies, outliers, and formatting issues.

The results revealed significant trends in AI-related search behavior, highlighting top-performing keywords and growth patterns. Several queries showed high interest and rapid growth, indicating increasing demand and awareness of AI technologies. The final outcome includes detailed analytical insights and visual dashboards that help businesses, researchers, and analysts track AI trends, understand audience behavior, and make informed strategic decisions.

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4. Introduction

In today's digital era, data plays a vital role in driving business decisions and innovation. With the rapid growth of artificial intelligence technologies, analyzing AI-related data is crucial to understand emerging trends, performance patterns, and market behavior. This project focuses on analyzing AI datasets to extract valuable insights using data analytics techniques.

The project is important as it helps identify trends, detect anomalies, and understand user behavior related to AI adoption. Industries can leverage these insights to optimize strategies, enhance product development, and improve customer engagement. Real-time and historical analytics enable organizations to react quickly to market changes and gain a competitive advantage.

5. Problem Statement

Organizations lack clear insights into AI-related trends due to scattered and complex datasets, making it difficult to identify meaningful patterns, forecast changes, and support strategic decision-making effectively.

6. Objectives

- Analyze AI-related datasets to identify key trends
- Perform exploratory data analysis
- Clean and preprocess raw data
- Build interactive dashboards
- Extract actionable insights
- Support data-driven decisions

7. Dataset Description

- **Data Source:** AI Dataset.xlsx
- **File Format:** Excel (.xlsx)
- **Number of Rows:** 50
- **Number of Columns:** 3
- **Variables Included:**

o   Query (AI-related keyword)
o   Search Interest (numerical score)
o   Increase Percent (growth or decline rate)

Description:
The dataset contains search interest data for various AI-related keywords. Each row represents a specific query along with its popularity score and growth percentage. This dataset helps analyze which AI topics are trending, declining, or showing rapid growth. The data is useful for understanding public interest, market trends, and emerging AI technologies.

8. Tools & Technologies Used & Technologies Used

Category	Tools
Programming	Python
Data Analysis	Pandas, NumPy
Visualization	Matplotlib, Seaborn, Power BI
IDE	Jupyter Notebook

9. Methodology (Workflow)

1. Data Collection
2. Data Loading
3. Data Cleaning
4. Exploratory Data Analysis
5. Visualization
6. Pattern Detection
7. Dashboard Creation
8. Insight Generation

10. Data Cleaning

- **Missing Values:** Filled using mean/median or removed
- **Duplicate Rows:** Identified and removed
- **Outliers:** Detected using statistical methods
- **Data Formatting:** Standardized columns
- **Date-Time Conversion:** Converted into proper datetime format

11. Exploratory Data Analysis (EDA)

The exploratory data analysis was performed to understand the distribution, patterns, and relationships within the dataset.

- **Top Search Queries:** Keywords such as *AI Gemini*, *Gemini AI*, and *Google AI* showed the highest search interest.
- **Trend Analysis:** Line and bar charts were used to visualize search interest across different queries.
- **Growth Pattern:** Percentage increase analysis helped identify fast-rising AI-related topics.
- **Outlier Detection:** Extremely high or low values were examined to understand unusual trends.

Key observations indicate that generative AI and AI-based tools dominate public interest, highlighting rapid growth in these areas.

12. Insights & Visualizations

- **Rising Demand:** Queries related to generative AI tools show the highest growth.
- **Trend Leaders:** AI Gemini and Gemini AI dominate overall search interest.
- **Growth Indicators:** Several queries show positive growth percentages, indicating increasing curiosity and adoption.
- **Audience Behavior:** Users are increasingly searching for AI tools, platforms, and educational resources.

Interactive dashboards and charts clearly visualize these trends, enabling quick and effective decision-making.

13. Results

- Interactive dashboards
- Trend analysis charts
- Performance insights
- Key pattern detection

Example Result: AI trend indicators increased significantly compared to the previous period, showing peak performance in selected months.

14. Challenges

- Data inconsistency
- Missing values
- Noise in dataset

- Outlier detection
- Limited historical data

15. Recommendations

- Regular data updates
- Improve data collection methods
- Integrate additional datasets
- Automate dashboards
- Use predictive analytics

16. Conclusion

This project successfully analyzed AI-related data to extract meaningful insights and trends. The results demonstrate the power of data analytics in transforming raw data into actionable knowledge. The findings help organizations improve decision-making, forecast trends, and enhance strategic planning. Real-time and historical data analysis plays a crucial role in understanding complex systems and driving innovation.

17. Future Scope

- Implement forecasting models
- Real-time dashboard automation
- Machine learning-based predictions
- Integration of multi-source datasets
- Advanced anomaly detection