GOOGLE SEARCH KEYWORD ANALYSIS USING PYTHON

INTRODUCTION

In the digital era, understanding what people search for on Google can provide powerful insights into user behavior, public interest, and trending topics.

This project leverages the Google Trends data to analyze the search popularity of specific keywords across different regions and over a defined period of time. The analysis is done using Python, with visualization support from Plotly and Matplotlib.

PROJECT GOALS

- To extract Google search trends for one or more keywords using the pytrends library.
- Top 15 Countries where the keyword is searched most.
- To analyze interest over time for each keyword.
- To map geographical distribution of search interest using a choropleth map.
- To generate visual insights that can help stakeholders, marketers, researchers, and analysts.

TOOL’S

Tool/Library	Purpose
Python	Core programming language
pytrends	API wrapper to access Google Trends data
pandas	Data manipulation and analysis
matplotlib	Time-series plotting
plotly.express	Interactive geographical and heatmap plots
Jupyter Notebook	Interactive coding and documentation

RESULT'S

- China leads globally in search interest (score: 100), reflecting major national focus on machine learning and development.

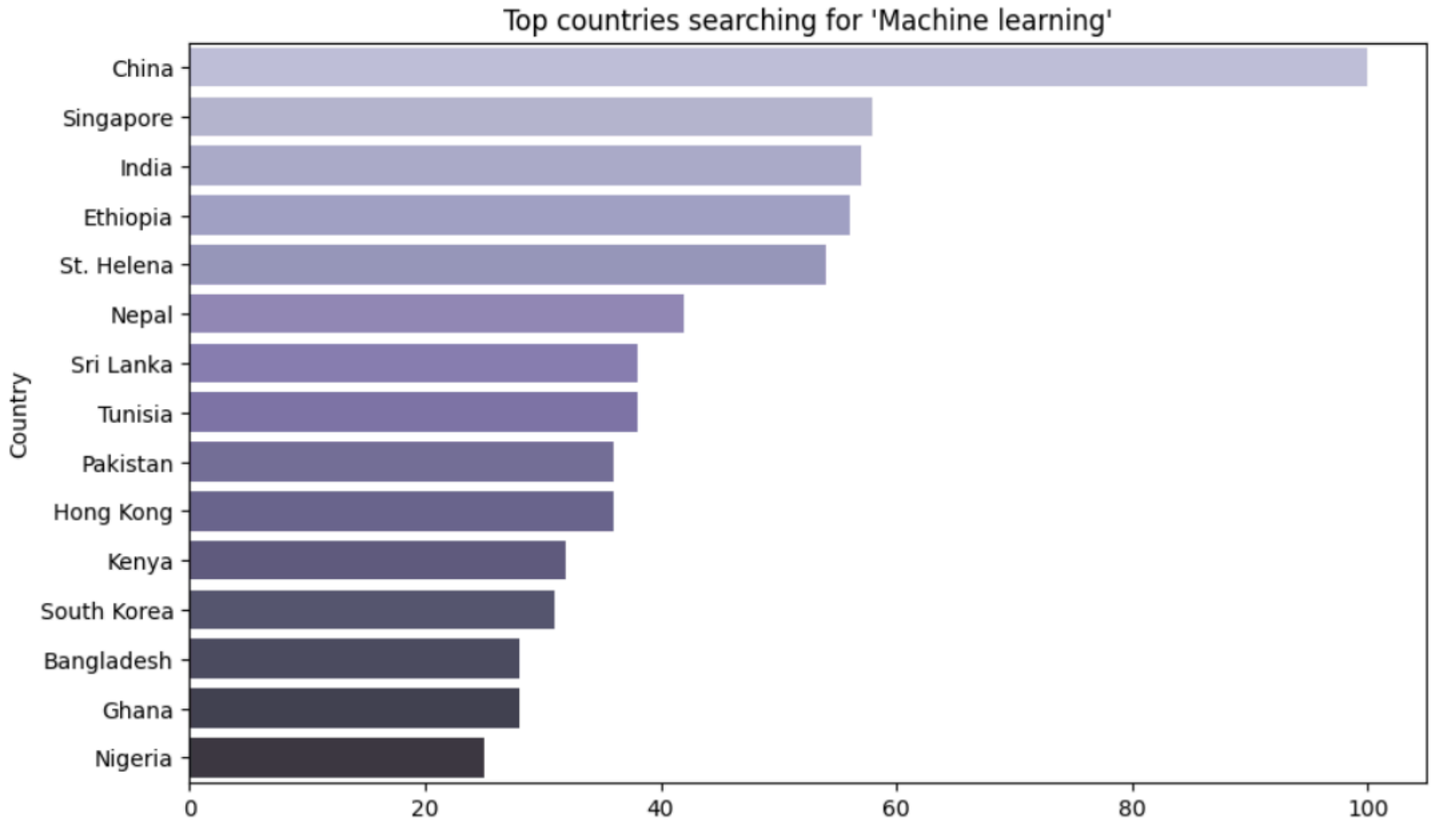
Regional Trends:

- Asia dominates the chart: Singapore, India, Nepal, Sri Lanka, and Pakistan show strong interest.
- Africa emerging: Ethiopia, Kenya, Ghana, and Nigeria indicate rising curiosity and adoption in AI/ML education.
- St. Helena, despite its small population, ranks high—likely due to low base population or isolated search activity.

country wise interest

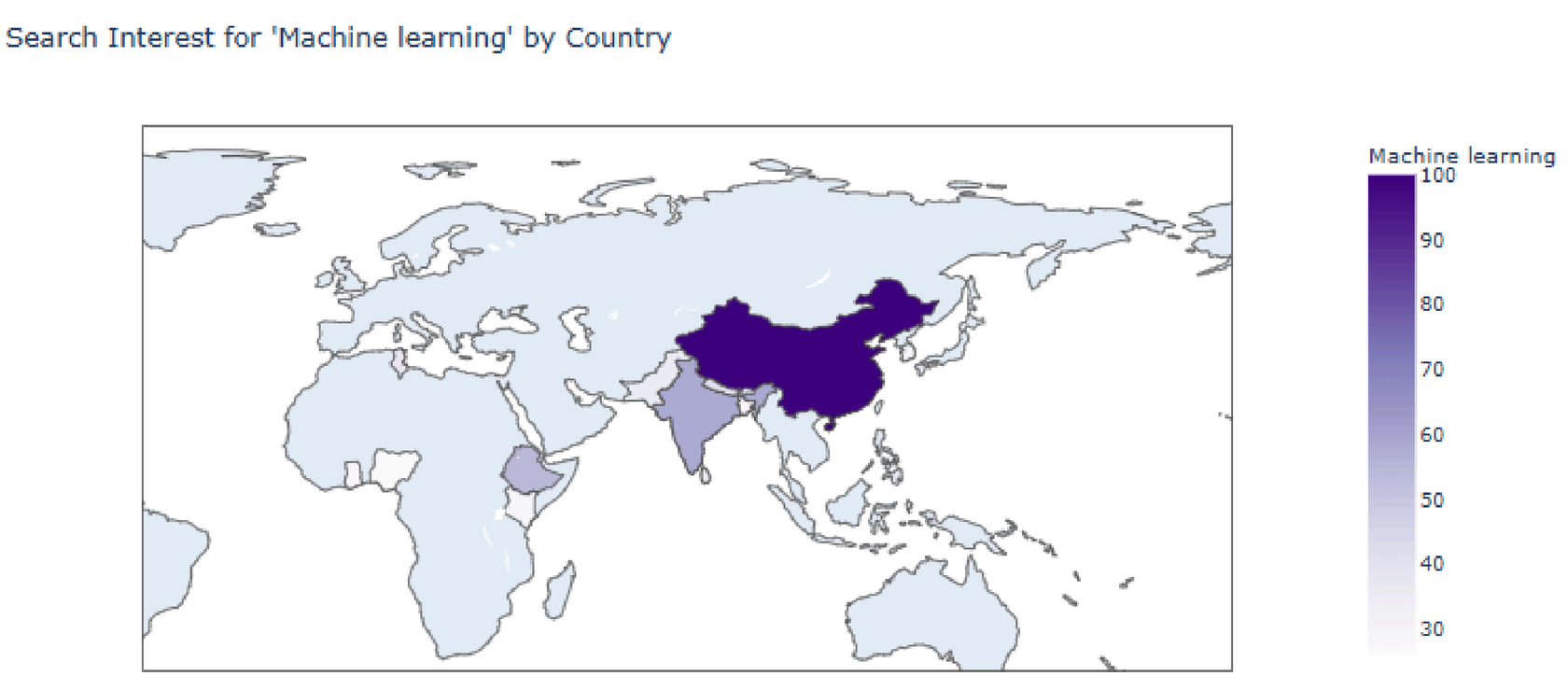
```
region_data=pytrends.interest_by_region()
region_data=region_data.sort_values(by=keyword ,ascending=False).head(15)
```

```
plt.figure(figsize=(10,6))
sns.barplot(x=region_data[keyword] ,y=region_data.index ,palette="Purples_d")
plt.title(f"Top countries searching for '{keyword}'")
plt.xlabel("Interest")
plt.ylabel("Country")
plt.show()
```



world map i.e. geographical view

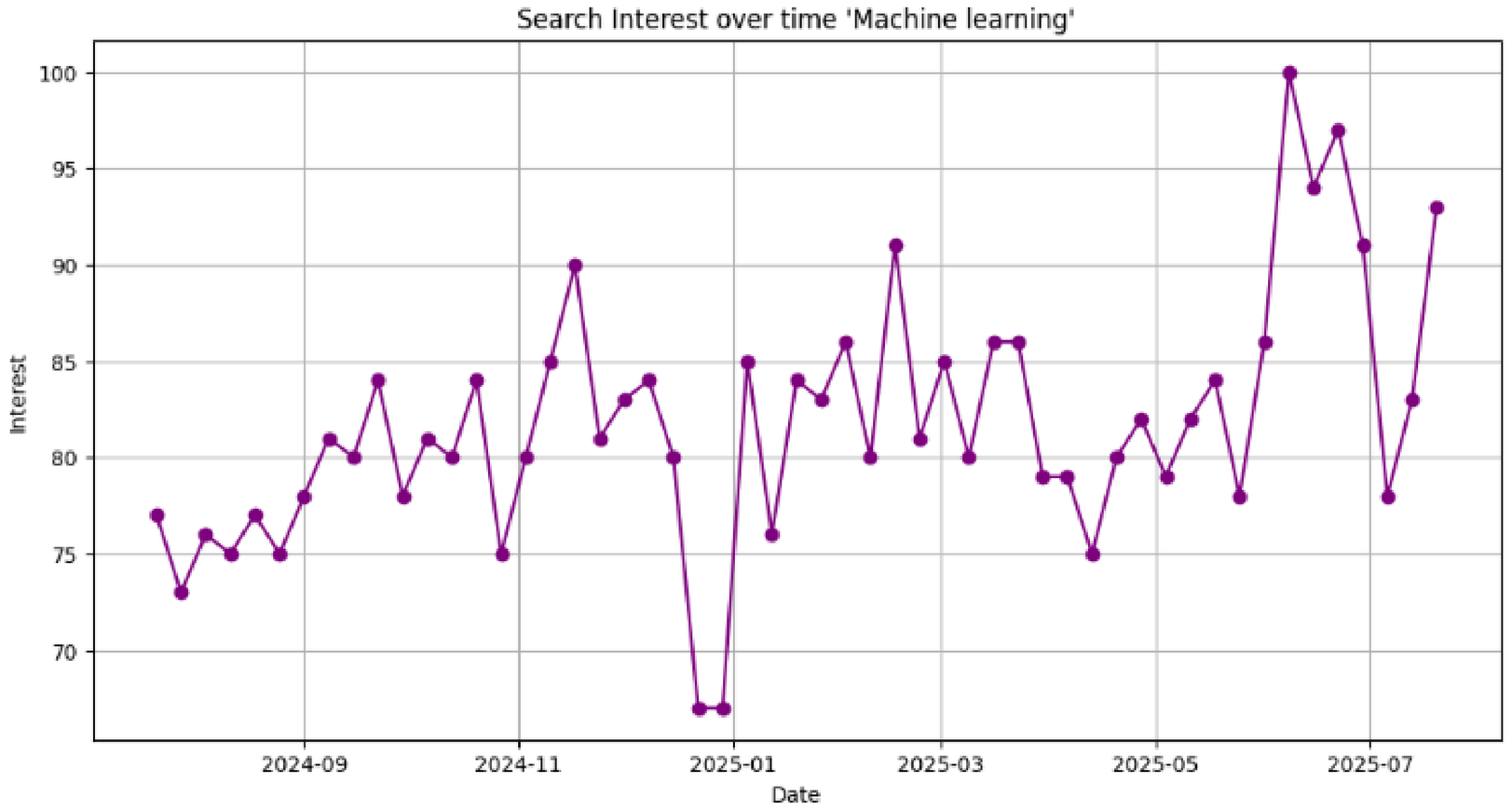
[6]:
```
region_data=region_data.reset_index()
fig=px.choropleth(region_data,
                  locations='geoName',
                  locationmode='country names',
                  color=keyword,
                  title=f"Search Interest for '{keyword}' by Country",
                  color_continuous_scale='Purples'
                  )
fig.show()
```



time wise interest

[7]:
```
time_df=pytrends.interest_over_time()
```

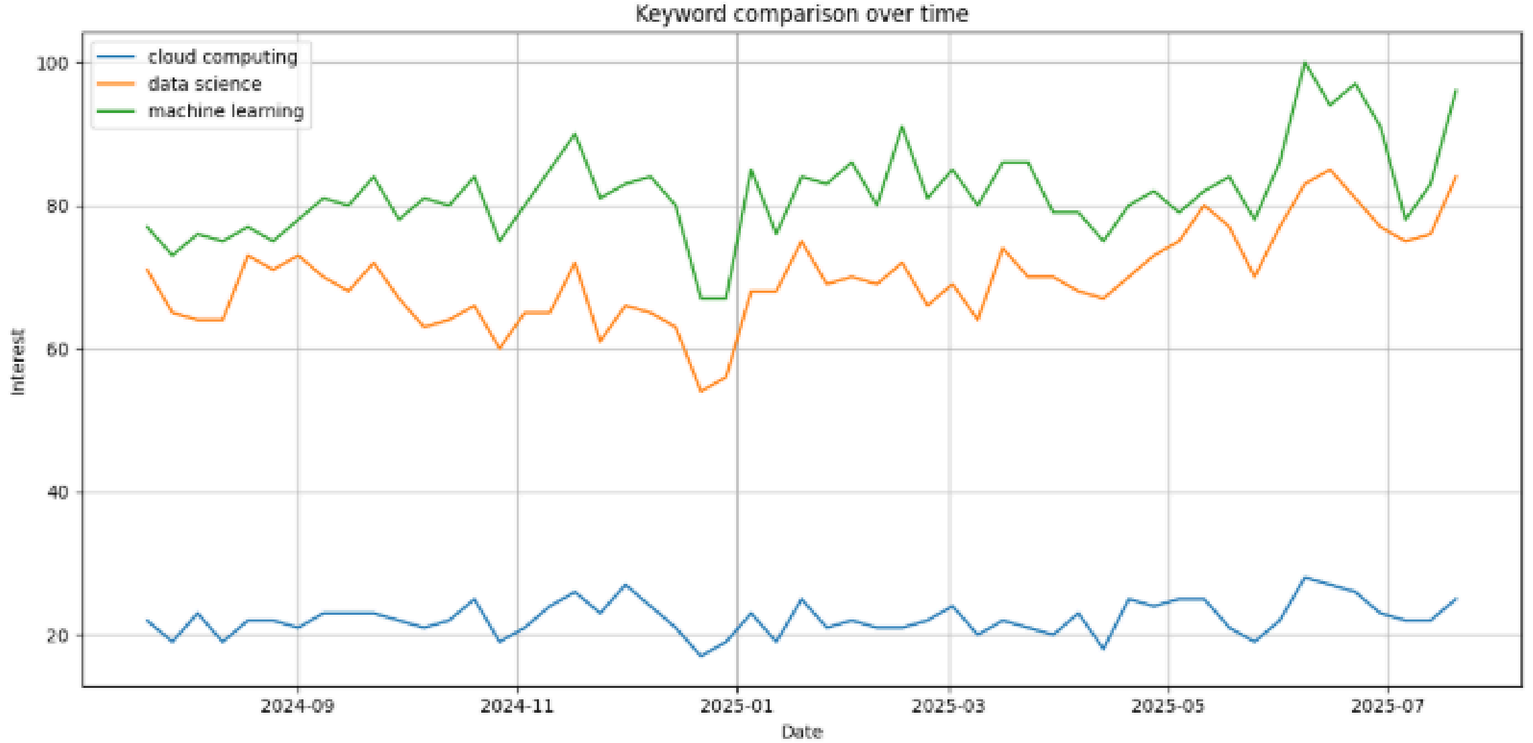
[72]:
```
plt.figure(figsize=(12,6))
plt.plot(time_df.index, time_df[keyword], marker='o', color='Purple')
plt.title(f"Search Interest over time '{keyword}'")
plt.xlabel("Date")
plt.ylabel("Interest")
plt.grid(True)
plt.show()
```



multiple keywords compare

```
kw_list=["cloud computing", "data science", "machine learning"]
pytrends.build_payload(kw_list, cat=0, timeframe="today 12-m", geo='', gprop='')
```

```
compare_df=pytrends.interest_over_time()
plt.figure(figsize=(12,6))
for kw in kw_list:
    plt.plot(compare_df.index, compare_df[kw], label=kw)
plt.title("Keyword comparison over time")
plt.xlabel("Date")
plt.ylabel("Interest")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```



CONCLUSION

This project successfully demonstrates how Python can be used to extract, analyze, and visualize search interest data from Google. By combining pytrends, Pandas, and Plotly, we built a flexible and insightful dashboard for keyword research.
Such an analysis is valuable in fields like:

- SEO and Digital Marketing
- Public Interest Research
- Trend Forecasting
- Brand Analysis