THE iSCALE

Google

Google Search Analysis with Python

Full Project

Data Science & Data Analytics

THE iSCALE

Google

As of recent estimates (2024–2025), Google processes over 8.5 billion searches per day

Google handles more than 99,000 searches every second, which equals:

- ~5.9 million searches per minute
- ~8.5 billion searches per day
- ~2.6 trillion searches per year

Google Trends data represents a very reliable proxy for public interest, making it ideal for:

- Market research
- Political forecasting
- News and media analysis
- Product demand analysis

Google

Suppose you are working in a data-driven job role, and you have to answer all these questions.

1) First, write a code where, by changing just the keyword, we can search for multiple things.

2) Top 15 countries where the keywords are searched the most, and also create visual representation of it.

3) A world map needs to be plotted showing the countries that search the keyword the most.

4) We need to extract the time-wise interest of the keyword — how it trended in different years.

5) Compare related keywords and plot the graph.

Pytrends is an unofficial Python library that allows easy access to Google Trends data through Google’s internal API. Since Google doesn’t provide an official public API for Trends data, Pytrends acts as a smart wrapper around Google's web interface, enabling data analysts and developers to extract trend data for various keywords, regions, and timeframes.

It is especially useful for:
- Market research
- Trend forecasting
- Competitive analysis
- Keyword research for SEO

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Siblings - Nishant Dhote & Swati Dhote

In [3]:

```
pip install pytrends matplotlib seaborn plotly pandas
```

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Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\swati\anacond
a3\lib\site-packages (from requests>=2.0->pytrends) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in c:\users\swati\anaconda3\lib\site-
packages (from requests>=2.0->pytrends) (3.7)
Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\swati\anaconda3\lib
\site-packages (from requests>=2.0->pytrends) (2.2.3)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\swati\anaconda3\lib
\site-packages (from requests>=2.0->pytrends) (2024.8.30)
Note: you may need to restart the kernel to use updated packages.
```

In [5]:

```
import pandas as pd
from pytrends.request import TrendReq
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
```

PyTrends Setup aur Keyword Define Karna:

In [7]:

```
pytrends = TrendReq(hl='en-US', tz=360)
keyword = "cloud computing"
```

Data Request Karna

In [12]:

```
pytrends.build_payload([keyword], cat=0, timeframe='today 12-m', geo='', gprop='
```

Country-wise Interest Nikalna

In [16]:

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

Bar Plot Banana (Top Countries):

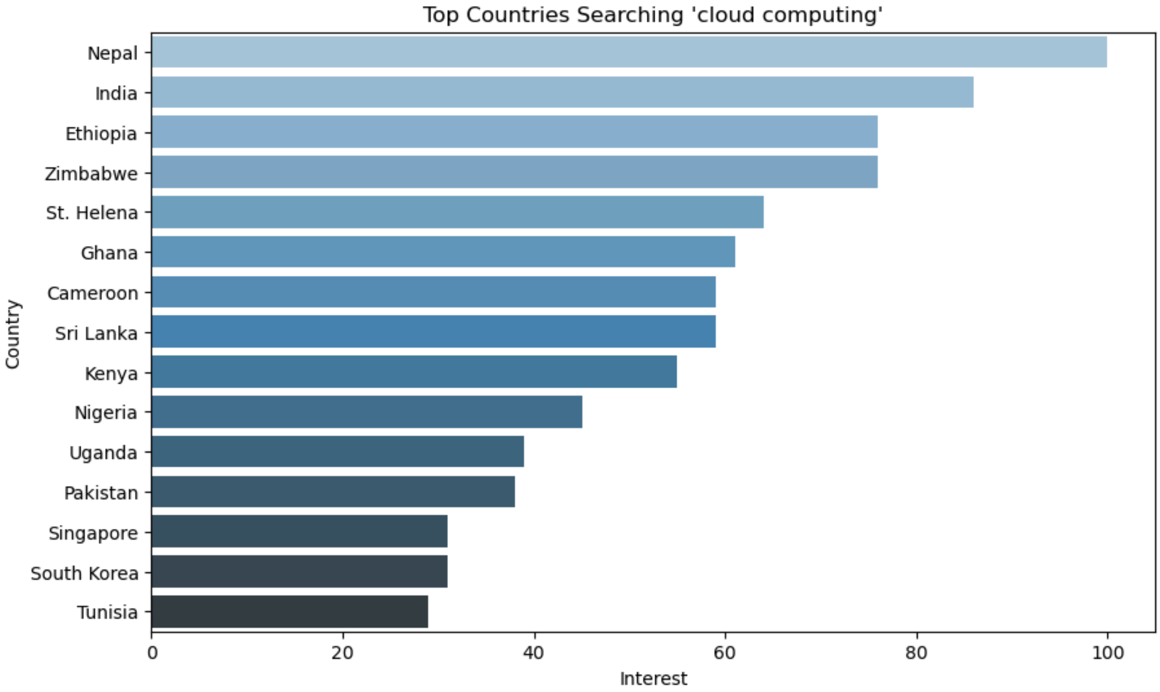
In [24]:

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

```
C:\Users\swati\AppData\Local\Temp\ipykernel_15552\158283913.py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v
0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effe
ct.

  sns.barplot(x=region_data[keyword], y=region_data.index, palette='Blues_d')
```



Choropleth (World Map Plot):

In [27]:
```
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='Blues')
fig.show()
```

Search Interest for 'cloud computing' by Country

Time-wise Interest Nikalna:

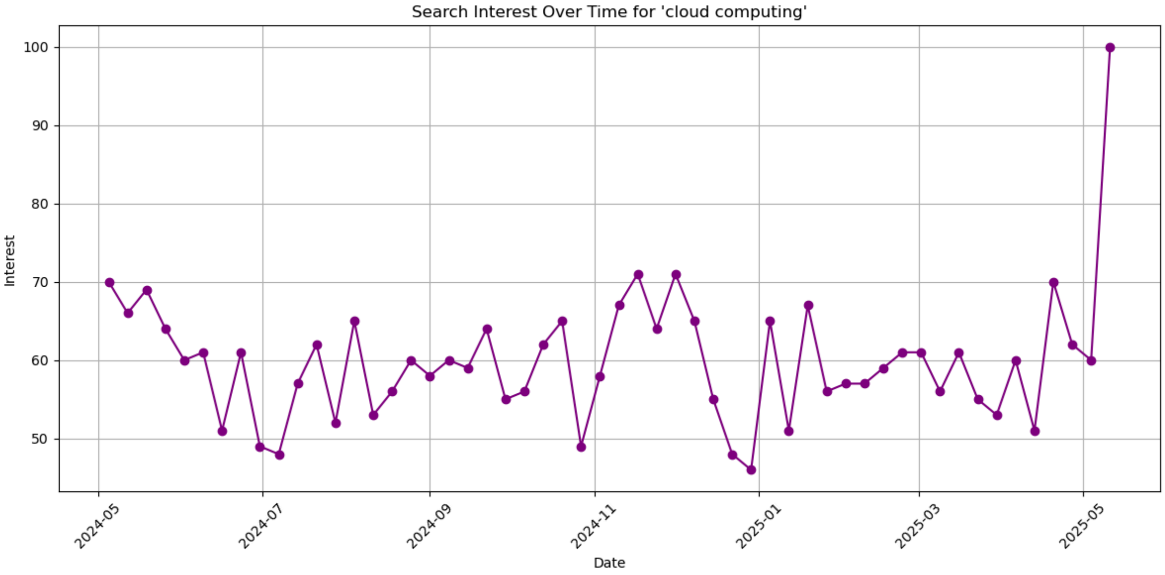
In [32]:
```
time_df = pytrends.interest_over_time()
```

```
C:\Users\swati\anaconda3\Lib\site-packages\pytrends\request.py:260: FutureWarnin
g:

Downcasting object dtype arrays on .fillna, .ffill, .bfill is deprecated and will
change in a future version. Call result.infer_objects(copy=False) instead. To opt
-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', Tr
ue)`
```

Line Plot (Search Trend Over Time)

In [35]:
```
plt.figure(figsize=(12,6))
plt.plot(time_df.index, time_df[keyword], marker='o', color='purple')
plt.title(f"Search Interest Over Time for '{keyword}'")
plt.xlabel("Date")
plt.ylabel("Interest")
plt.grid(True)
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



Multiple Keywords Compare Karna

In [41]:

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

Comparison Plot (Line Plot of All 3 Keywords)

In [44]:

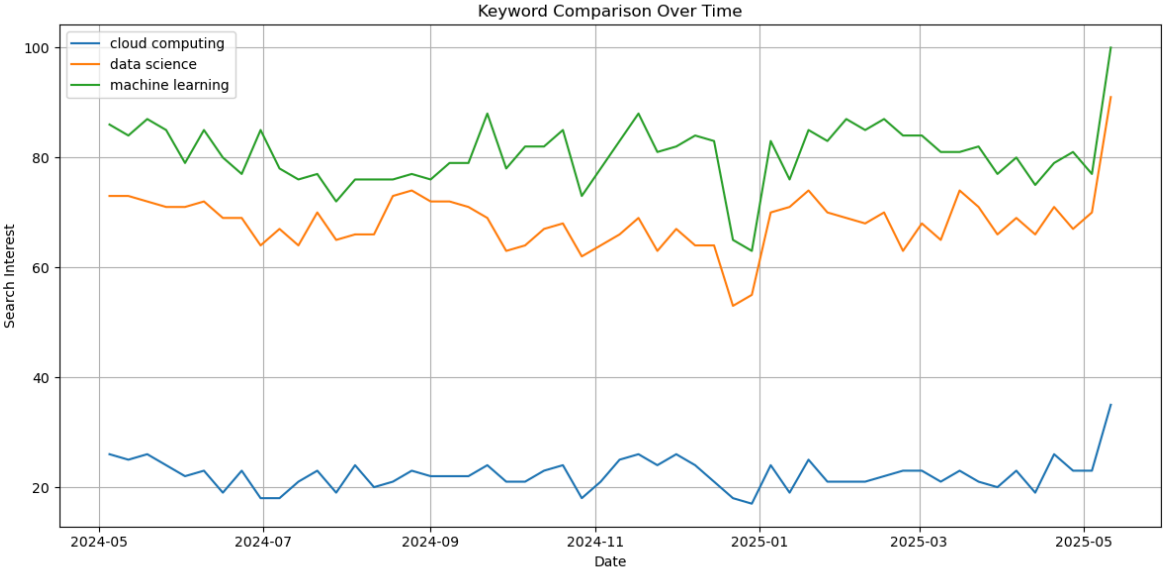
```
compare_df = pytrends.interest_over_time()

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("Search Interest")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```

```
C:\Users\swati\anaconda3\Lib\site-packages\pytrends\request.py:260: FutureWarnin
g:

Downcasting object dtype arrays on .fillna, .ffill, .bfill is deprecated and will
change in a future version. Call result.infer_objects(copy=False) instead. To opt
-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', Tr
ue)`
```


Keyword Comparison Over Time
cloud computing
data science
machine learning
Search Interest
100
80
60
40
20
2024-05
2024-07
2024-09
2024-11
2025-01
2025-03
2025-05
Date

```
In [ ]:
```