In [2]:
```
pip install pytrends plotly pandas matplotlib prophet wordcloud
```

```
Requirement already satisfied: pytrends in /Library/Frameworks/Python.framew
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```

```
5.2)
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hon.framework/Versions/3.13/lib/python3.13/site-packages (from requests>=2.0
->pytrends) (2025.7.14)
Note: you may need to restart the kernel to use updated packages.
```

In [3]:
```
from pytrends.request import TrendReq
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
from prophet import Prophet
```

setup pytrend library and keyword define :

In [4]:
```
pytrends = TrendReq(hl = 'en-US' , tz = 360)
```

Change keyword here

In [5]:
```
keyword = "Artificial Intelligence"
```

Data Request

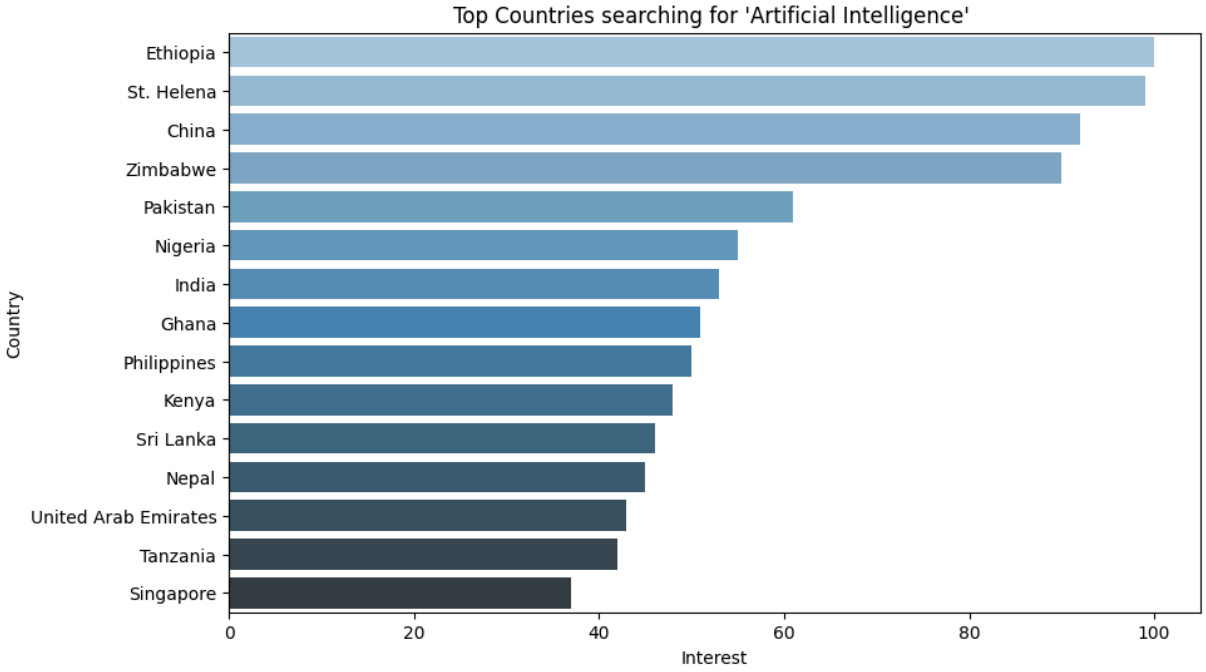
In [6]:
```
pytrends.build_payload([keyword], cat = 0, timeframe ='today 12-m', geo='',
```

1 Country Wise Interest

In [7]:
```
region_data = pytrends.interest_by_region()
region_data = region_data.sort_values(by = keyword,ascending = False).head (
```

In [8]:
```
plt.figure(figsize = (10,6))
sns.barplot(x = region_data[keyword], y = region_data.index, palette = "Blue
plt.title(f"Top Countries searching for '{keyword}' ")
plt.xlabel("Interest")
plt.ylabel("Country")
plt.show()
```

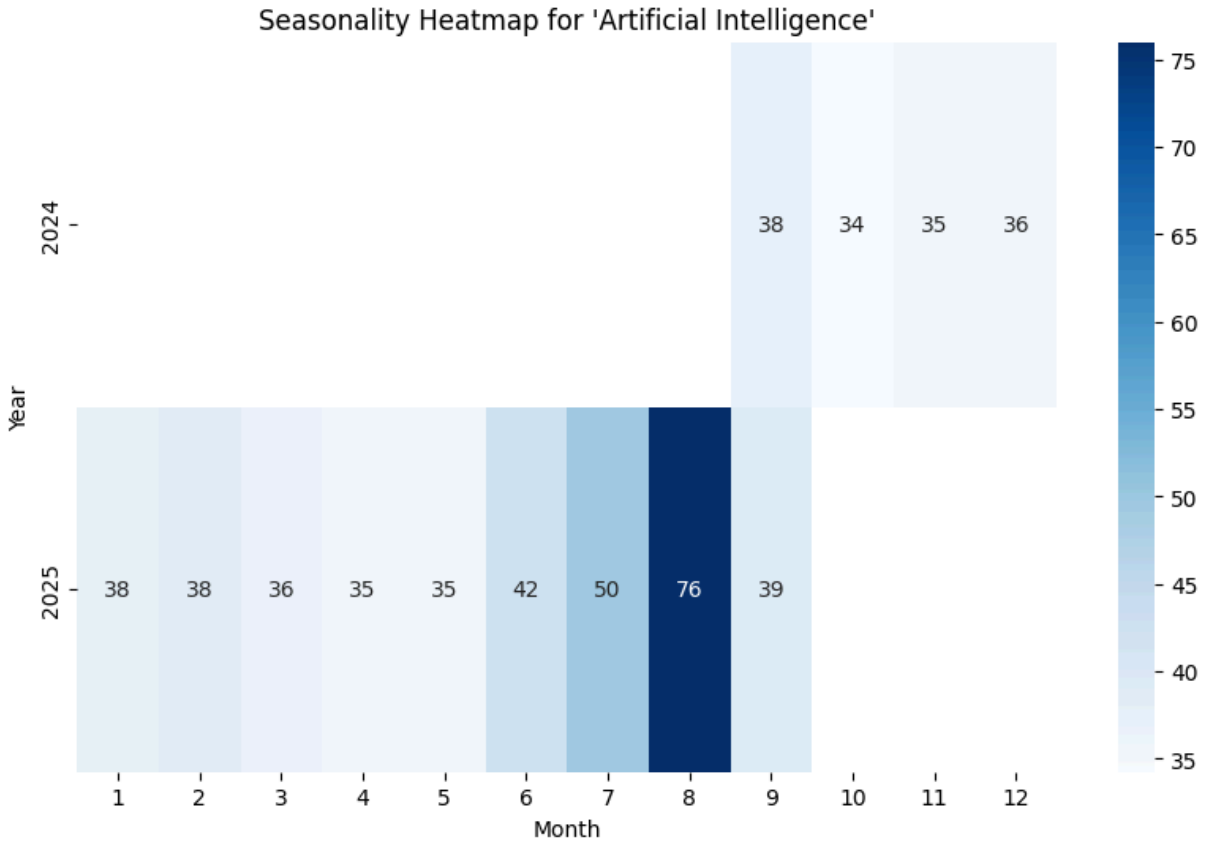
```
/var/folders/2n/7dq46w4174g3sbf4nxlr3dvm0000gn/T/ipykernel_19147/4237842116.
py:2: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed
in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the
same effect.

  sns.barplot(x = region_data[keyword], y = region_data.index, palette = "Bl
ues_d")
```



2) Seasonality Analysis (Monthly Heatmap)

In [9]:
```
time_data = pytrends.interest_over_time()
if not time_data.empty:
    time_data['month'] = time_data.index.month
    time_data['year'] = time_data.index.year
    pivot = time_data.pivot_table(values=keyword, index='year', columns='mor

    plt.figure(figsize=(10, 6))
    sns.heatmap(pivot, cmap="Blues", annot=True, fmt=".0f")
    plt.title(f"Seasonality Heatmap for '{keyword}'")
    plt.xlabel("Month")
    plt.ylabel("Year")
    plt.show()
```

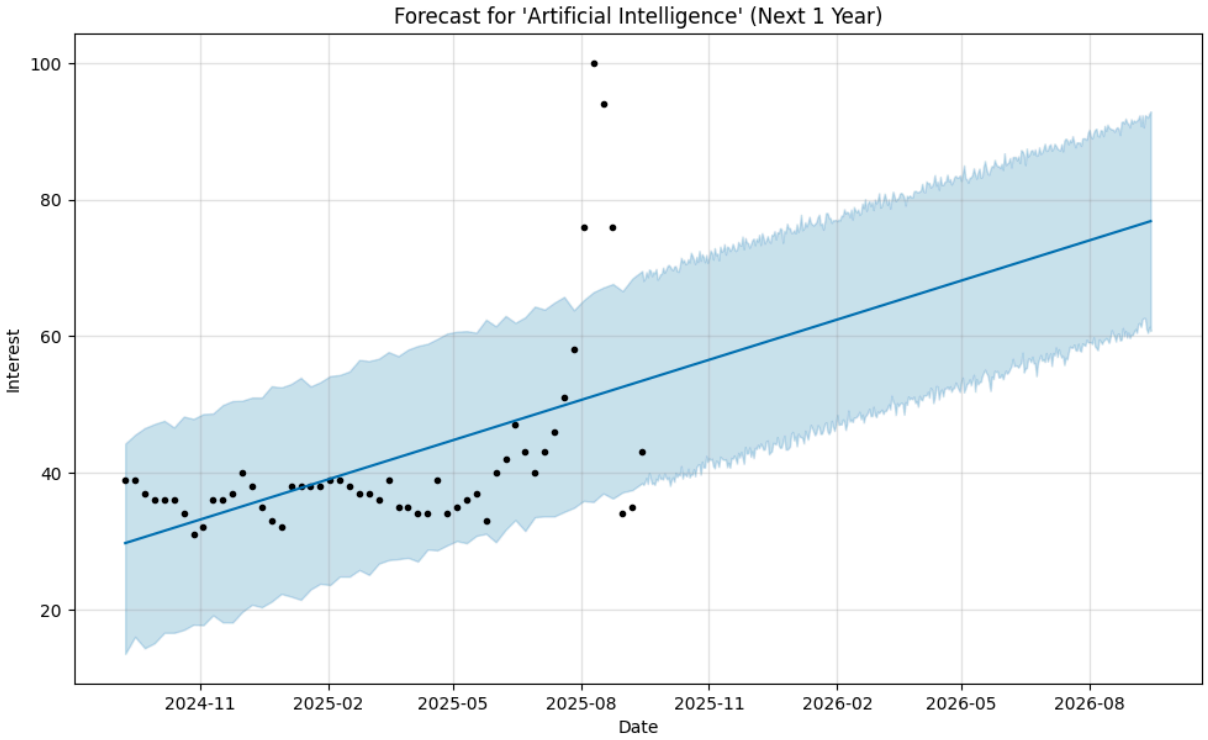
```
/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packages/pytrends/request.py:260: FutureWarning: Downcasting object dtype arrays on .fillna, .ffill, .bfill is deprecated and will change in a future version. Call result.infer_objects(copy=False) instead. To opt-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', True)`
  df = df.fillna(False)
```

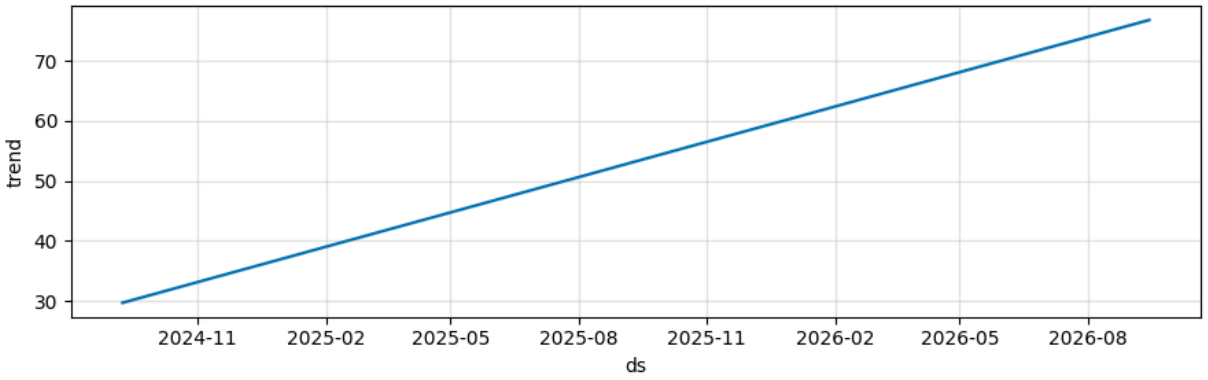


3) Forecasting with Prophet

In [10]:
```
if not time_data.empty:
    df_forecast = time_data.reset_index()[['date', keyword]].rename(columns=

    model = Prophet()
    model.fit(df_forecast)

    future = model.make_future_dataframe(periods=365)
    forecast = model.predict(future)

    model.plot(forecast)
    plt.title(f"Forecast for '{keyword}' (Next 1 Year)")
    plt.xlabel("Date")
    plt.ylabel("Interest")
    plt.show()

    model.plot_components(forecast)
    plt.show()
```

```
14:53:28 - cmdstanpy - INFO - Chain [1] start processing
14:53:28 - cmdstanpy - INFO - Chain [1] done processing
```





4) Device/Platform Analysis

In [11]:
```
platforms = {
    "Web Search": "",
    "YouTube": "youtube",
    "News": "news",
    "Images": "images",
}

platform_results = {}

for name, gprop in platforms.items():
    pytrends.build_payload([keyword], timeframe='today 5-y', geo='', gprop=g
    df = pytrends.interest_over_time()
    if not df.empty:
        platform_results[name] = df[keyword]
```

```
# Plot comparison
plt.figure(figsize=(12, 6))
for platform, series in platform_results.items():
    plt.plot(series.index, series, label=platform)
plt.legend()
plt.title(f"Platform-wise Interest for '{keyword}'")
plt.xlabel("Year")
plt.ylabel("Interest")
plt.grid(True)
plt.show()
```

```
/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packa
ges/pytrends/request.py:260: FutureWarning: Downcasting object dtype arrays
on .fillna, .ffill, .bfill is deprecated and will change in a future versio
n. Call result.infer_objects(copy=False) instead. To opt-in to the future be
havior, set `pd.set_option('future.no_silent_downcasting', True)`
  df = df.fillna(False)
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ges/pytrends/request.py:260: FutureWarning: Downcasting object dtype arrays
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  df = df.fillna(False)
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  df = df.fillna(False)
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ges/pytrends/request.py:260: FutureWarning: Downcasting object dtype arrays
on .fillna, .ffill, .bfill is deprecated and will change in a future versio
n. Call result.infer_objects(copy=False) instead. To opt-in to the future be
havior, set `pd.set_option('future.no_silent_downcasting', True)`
  df = df.fillna(False)
```
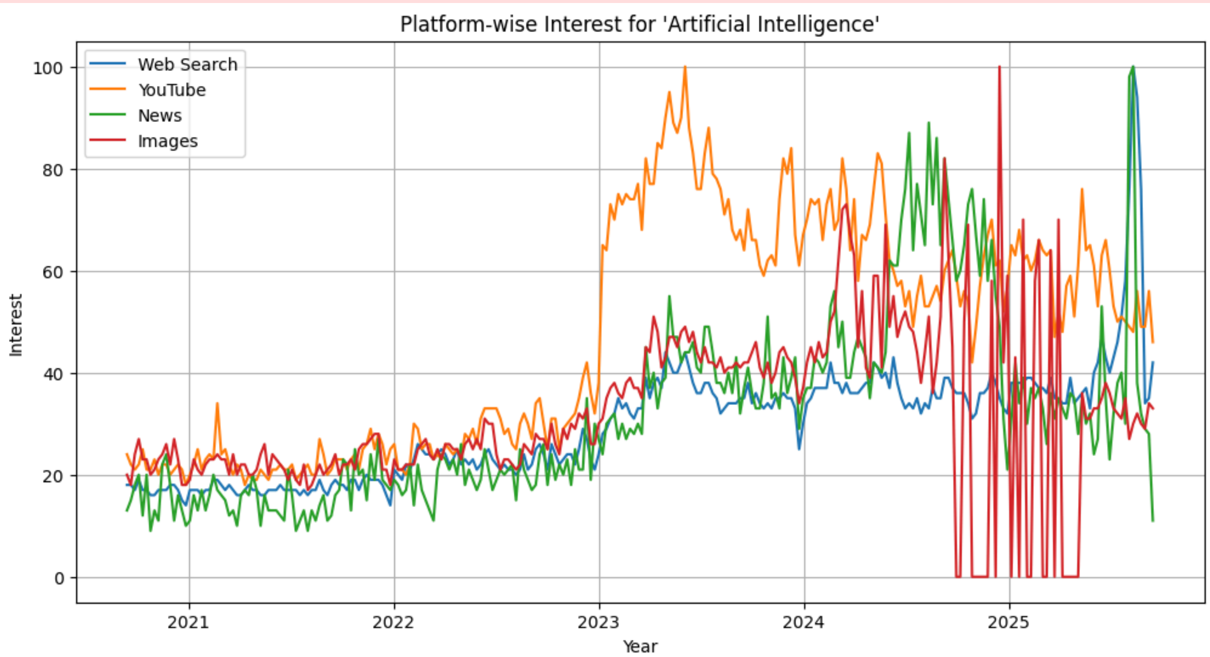
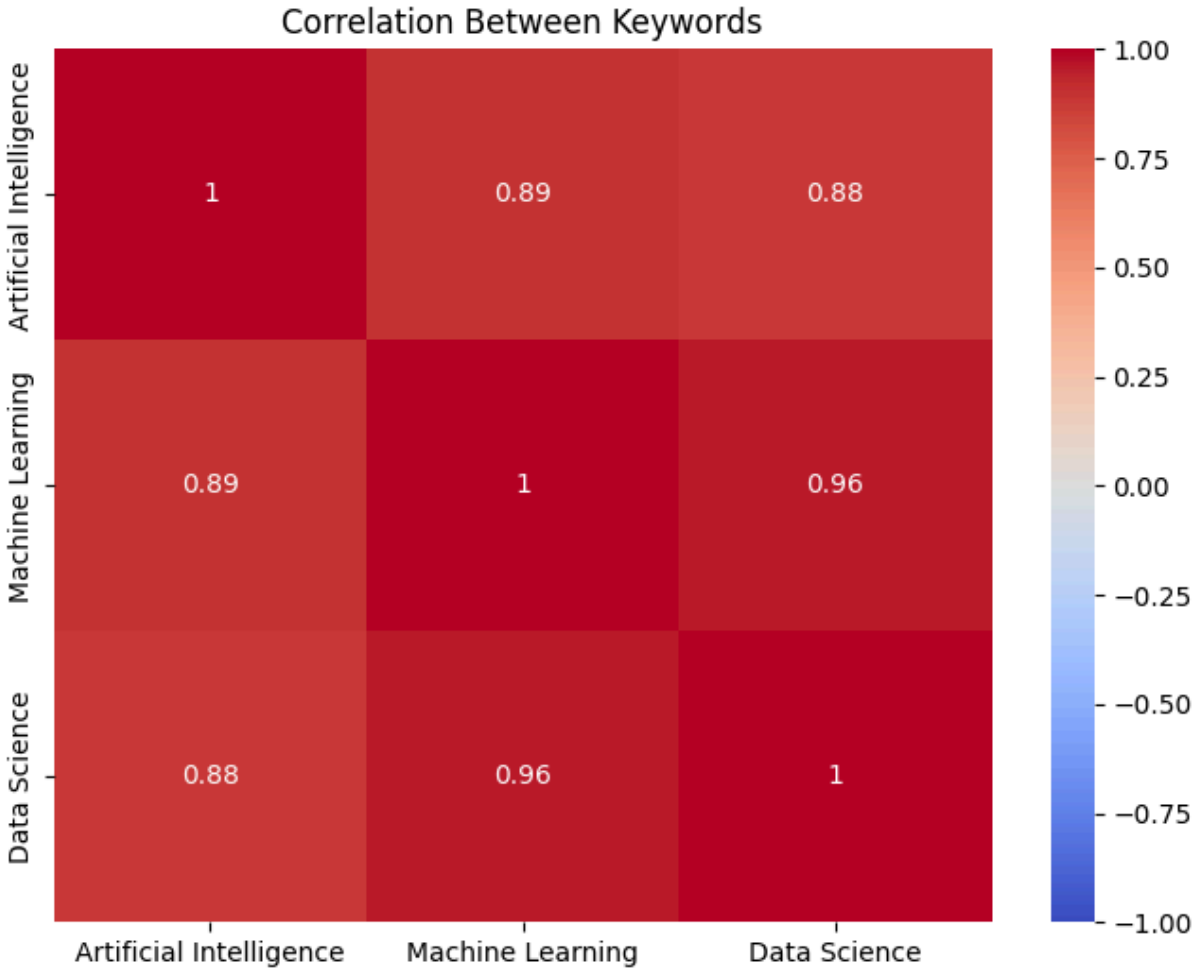



5) Correlation Between Keywords

In [12]:
```
compare_keywords = ["Artificial Intelligence", "Machine Learning", "Data Sci

pytrends.build_payload(compare_keywords, timeframe='today 5-y', geo='', gprc
compare_data = pytrends.interest_over_time()

corr_matrix = compare_data[compare_keywords].corr()

plt.figure(figsize=(8, 6))
sns.heatmap(corr_matrix, annot=True, cmap="coolwarm", vmin=-1, vmax=1)
plt.title("Correlation Between Keywords")
plt.show()
```

```
/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packa
ges/pytrends/request.py:260: FutureWarning: Downcasting object dtype arrays
on .fillna, .ffill, .bfill is deprecated and will change in a future versio
n. Call result.infer_objects(copy=False) instead. To opt-in to the future be
havior, set `pd.set_option('future.no_silent_downcasting', True)`
  df = df.fillna(False)
```



6) World map

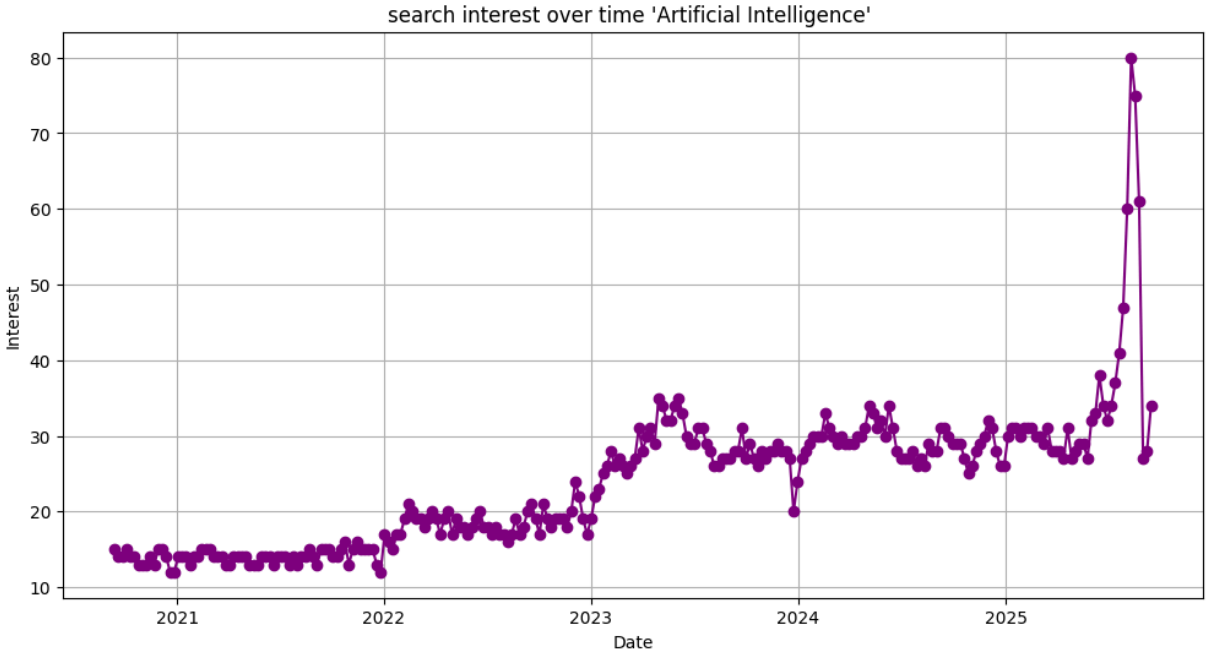
In [13]:
```
region_data = region_data.reset_index()
fig = px.choropleth(region_data,
                    locations= 'geoName',
                    locationmode= 'country names',
                    color=keyword,
                    title=f"Search Interest for '{keyword}' by Country",
                    color_continuous_scale='Blues')
fig. show()
```

7) Time wise Interest

In [14]:
```
time_df = pytrends.interest_over_time()
```

```
/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packages/pytrends/request.py:260: FutureWarning:

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', True)`
```

In [15]:
```
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()
```



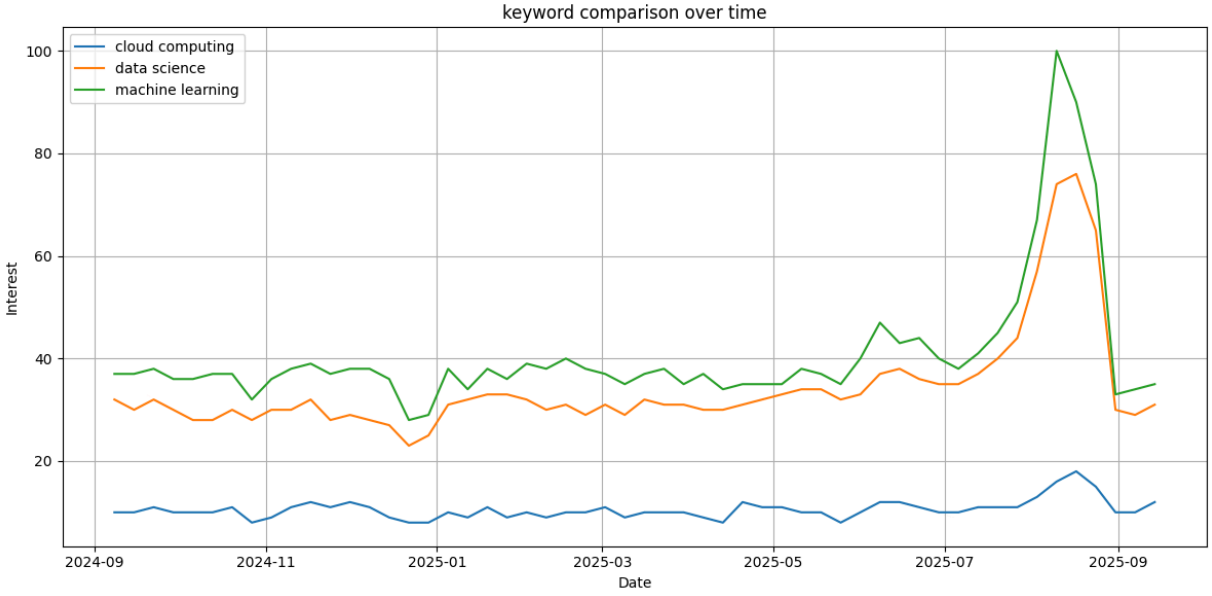
8) Multiple Keywords Compare

In [16]:
```
kw_list = ["cloud computing", "data science", "machine learning"]
pytrends.build_payload(kw_list, cat= 0, timeframe = 'today 12-m' ,geo ='',gp
```

In [17]:
```
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()
```

```
/Library/Frameworks/Python.framework/Versions/3.13/lib/python3.13/site-packages/pytrends/request.py:260: FutureWarning:

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', True)`
```



In [ ]: