```
import seaborn as sns
df = sns.load_dataset('healthexp')
Year Country Spending_USD Life_Expectancy
                                                  70.6
     0 1970 Germany 252.311
                                                  72.2
      1 1970
                             192.143
                   France
      2 1970 Great Britain
                                                  71.9
                                                  72.0
                                150.437
      4 1970
                      USA
                                                   70.9
                              6938.983
                                                  81.1
      269 2020 Germany
      270 2020 France
                               5468.418
                                                  82.3
      271 2020 Great Britain 5018.700
     272 2020 Japan 4665.641
                                                   84.7
     273 2020 USA 11859.179
     274 rows × 4 columns
  다음 단계: of 변수로 코드 생성 💿 추천 차트 보기
 소득과 기대수명 데이터 분석보고서

~ 전체 국가는?

countries = df['Country'].unique()
print(f"전체 국가: {', '.join(countries)}")
🌫 전체 국가: Germany, France, Great Britain, Japan, USA, Canada
> 언제부터?
start_year = df['Year'].min()
print(f"시작 연도: {start_year}")
→ 시작 연도: 1970

    특정 연도 범위를 선택하여 데이터를 필터링

df_filtered = df[df['Year'].between(2000, 2010)]
df_filtered
 Year Country Spending_USD Life_Expectancy
      148 2000 Canada 2450.593
                                                 78.2
                                                  79.2
      150 2000 France 2687.530
                                                  77.9
                              1897.202
                               1847.786
                                                  81.2
                     Japan
      209 2010 Germany
                              4423.070
                                                  80.5
                                                  81.8
      211 2010 Great Britain
                                                   80.6
                                                   82.9
     213 2010 USA 7879.253
                                                   78.6
     66 rows × 4 columns
  ~ 국가별?
df_by_country = df.groupby('Country').describe()
df_by_country
                 count mean std min 25% 50% 75% max count mean ... 75% max count mean std min 25% 50% 75% max
                 44.0 1998.318182 13.183451 1971.0 1987.75 1998.5 2009.25 2020.0 44.0 2685.778341 ... 3998.28700 5828.324 44.0 78.706818 2.502222 72.8 76.775 78.7 80.975 82.2
                 35.0 2001.857143 12.466763 1970.0 1994.50 2003.0 2011.50 2020.0 35.0 3045.145057 ... 4230.56600 5468.418 35.0 79.565714 2.862120 72.2 78.050 79.4 82.200 82.9
       Germany 50.0 1995.080000 15.005904 1970.0 1982.25 1995.5 2007.75 2020.0 50.0 2667.280200 ... 3904.04875 6938.983 50.0 76.726000 3.473915 70.6 73.575 77.1 80.175 81.3
      Great Britain 43.0 1998.627907 13.273718 1970.0 1988.50 1999.0 2009.50 2020.0 43.0 2034.192465 ... 3388.10800 5018.700 43.0 77.620930 2.827548 71.9 75.350 77.5 80.400 81.4

        Japan
        51.0
        1995.000000
        14.866069
        1970.0
        1982.50
        1995.0
        2007.50
        2020.0
        51.0
        1860.257902
        ...
        2744.55700
        4665.641
        51.0
        79.554902
        3.547242
        72.0
        76.950
        79.8
        82.650
        84.7

         USA 51.0 1995.000000 14.866069 1970.0 1982.50 1995.0 2007.50 2020.0 51.0 4388.570529 ... 7275.76950 11859.179 51.0 75.843137 2.336258 70.9 74.550 75.7 77.950 78.9
    6 rows × 24 columns
국가별 평균 소득
country_income_mean = df.groupby('Country')['Spending_USD'].mean().sort_values(ascending=False)
print("국가별 평균 소득:")
print(country_income_mean)
→ 국가별 평균 소득:
    Country
                  4388.570529
    USA
    France
                3045.145057
    Canada 2685.778341
     Germany 2667.280200
    Great Britain 2034.192465
                 1860.257902
    Name: Spending_USD, dtype: float64
< 국가별 평균 기대수명
country_life_expectancy_mean = df.groupby('Country')['Life_Expectancy'].mean().sort_values(ascending=False)
print("국가별 평균 기대수명:")
print(country_life_expectancy_mean)
→ 국가별 평균 기대수명:
    Country
                 79.565714
    France
                 79.554902
    Canada 78.706818
    Great Britain 77.620930
    Germany 76.726000
              75.843137
    Name: Life_Expectancy, dtype: float64
< 각 국가의 연도별 소득 변화 추세
(이 그래프는 각 국가의 연도별 평균 소득 변화를 보여줍니다. 예를 들어, 특정 국가의 소득이 시간이 지나면서 어떻게 변했는지를 쉽게 알 수 있습
 니다.)
plt.figure(figsize=(14, 7))
sns.lineplot(x='Year', y='Spending_USD', hue='Country', data=df, marker='o')
plt.title('각 국가의 연도별 평균 소득 변화 추세')
plt.ylabel('평균 소득 (달러)')
plt.xlabel('연도')
plt.legend(bbox_to_anchor=(1.05, 1), loc=2)
plt.show()
fig.canvas.print_figure(bytes_io, **kw)
    /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44512 (WN{HANGUL SYLLABLE GYUN}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 49548 (WN{HANGUL SYLLABLE SO}) missing from current font.
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46301 (WN{HANGUL SYLLABLE DEUG}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45804 (WN{HANGUL SYLLABLE DAL}) missing from current font.
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 47084 (WN{HANGUL SYLLABLE REO}) missing from current font.
      fig.canvas.print_figure(bytes_io. **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44033 (WN{HANGUL SYLLABLE GAG}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44397 (WN{HANGUL SYLLABLE GUG}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44032 (WN{HANGUL SYLLABLE GA}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 51032 (WN{HANGUL SYLLABLE YI}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 50672 (WN{HANGUL SYLLABLE YEON}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46020 (WN{HANGUL SYLLABLE DO}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48324 (WN{HANGUL SYLLABLE BYEOL}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48320 (WN{HANGUL SYLLABLE BYEON}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 54868 (WN{HANGUL SYLLABLE HWA}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 52628 (WN{HANGUL SYLLABLE CU}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49464 (WN{HANGUL SYLLABLE SE}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
                                                                    0 000 000 00 00 00 00
         12000 -
                                                                                                                                                       --- Germany
                                                                                                                                                       ── France
                                                                                                                                                       --- Great Britain
                                                                                                                                                      −•− Japan
                                                                                                                                                       --- USA
                                                                                                                                                       ─●─ Canada
         8000
         6000 ·
                                    1980
                                                                                                                 2010
                                                                                                                                       2020
                                           1980
                                                                  1990
                                                                                         2000
    이 그래프는 각 국가의 연도별 평균 소득 변화를 보여줍니다. 예를 들어, 특정 국가의 소득이 시간이 지나면서 어떻게 변했는지를 쉽게 알 수 있습니다.
각 국가의 연도별 기대수명 변화 추세
(이 그래프는 각 국가의 연도별 평균 기대수명 변화를 보여줍니다. 예를 들어, 특정 국가의 사람들의 기대수명이 시간이 지나면서 어떻게 변했는지
를 쉽게 알 수 있습니다.)
# 각 국가의 연도별 기대수명 변화 추세
plt.figure(figsize=(14, 7))
sns.lineplot(x='Year', y='Life_Expectancy', hue='Country', data=df, marker='o')
plt.title('각 국가의 연도별 평균 기대수명 변화 추세')
plt.ylabel('평균 기대수명 (년)')
plt.xlabel('연도')
plt.legend(bbox_to_anchor=(1.05, 1), loc=2)
plt.show()
print("이 그래프는 각 국가의 연도별 평균 기대수명 변화를 보여줍니다. 예를 들어, 특정 국가의 사람들의 기대수명이 시간이 지나면서 어떻게 변했는지를 쉽게 알 수 있습니다.")
 /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 54217 (\text{WN{HANGUL SYLLABLE PYEONG}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44512 (WN{HANGUL SYLLABLE GYUN}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44592 (WN{HANGUL SYLLABLE GI}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45824 (WN{HANGUL SYLLABLE DAE}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49688 (WN{HANGUL SYLLABLE SU}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 47749 (WN{HANGUL SYLLABLE MYEONG}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python. 10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45380 (WN{HANGUL SYLLABLE NYEON}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44033 (WN{HANGUL SYLLABLE GAG}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44397 (\text{WN{HANGUL SYLLABLE GUG})} missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44032 (WN{HANGUL SYLLABLE GA}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 51032 (WN{HANGUL SYLLABLE YI}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 50672 (WN{HANGUL SYLLABLE YEON}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46020 (WN{HANGUL SYLLABLE DO}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
     /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48324 (WN{HANGUL SYLLABLE BYEOL}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48320 (WN{HANGUL SYLLABLE BYEON}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 54868 (\\M\{HANGUL SYLLABLE HWA\}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 52628 (WN{HANGUL SYLLABLE CU}) missing from current font.
       fig.canvas.print_figure(bytes_io, **kw)
      /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49464 (WN{HANGUL SYLLABLE SE}) missing from current font.
      fig.canvas.print_figure(bytes_io, **kw)
                                                                0 000 000 00 0000 00 00
                                                                                                                                                    --- Germany
                                                                                                                                                    --- France
                                                                                                                                                    ── Great Britain
                                                                                                                                                    ─● Japan
                                                                                                                                                    --- USA
                                                                                                                                                    ── Canada
    이 그래프는 각 국가의 연도별 평균 기대수명 변화를 보여줍니다. 예를 들어, 특정 국가의 사람들의 기대수명이 시간이 지나면서 어떻게 변했는지를 쉽게 알 수 있습니다.
```

연도별 전 세계 평균 소득과 기대수명 변화

(파란색 선은 평균 소득을, 주황색 선은 평균 기대수명을 나타냅니다.)

연도별 평균 기대수명 변화 (2차 축) ax2 = ax1.twinx()global_stats['Life_Expectancy'].plot(kind='line', ax=ax2, color='orange', marker='o', label='평균 기대수명') ax2.set_ylabel('평균 기대수명 (년)') # 범례 추가 ax1.legend(loc='upper left') ax2.legend(loc='upper right') print("이 그래프는 연도별로 전 세계 사람들의 평균 소득과 평균 기대수명이 어떻게 변해왔는지를 보여줍니다. 파란색 선은 평균 소득을, 주황색 선은 평균 기대수명을 나타냅니다.") /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 54217 (WN{HANGUL SYLLABLE PYEONG}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44512 (WN{HANGUL SYLLABLE GYUN}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49548 (WN{HANGUL SYLLABLE SO}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46301 (WN{HANGUL SYLLABLE DEUG}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 45804 (WN{HANGUL SYLLABLE DAL}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 47084 (WN{HANGUL SYLLABLE REO}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44592 (WN{HANGUL SYLLABLE GI}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45824 (WN{HANGUL SYLLABLE DAE}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49688 (WN{HANGUL SYLLABLE SU}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 47749 (WN{HANGUL SYLLABLE MYEONG}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python. 10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45380 (WN{HANGUL SYLLABLE NYEON}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 50672 (WN{HANGUL SYLLABLE YEON}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python. 10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46020 (WN{HANGUL SYLLABLE DO}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48324 (WN{HANGUL SYLLABLE BYEOL}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 51204 (WN{HANGUL SYLLABLE JEON}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49464 (WN{HANGUL SYLLABLE SE}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 44228 (WN{HANGUL SYLLABLE GYE}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 44284 (WN{HANGUL SYLLABLE GWA}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48320 (WN{HANGUL SYLLABLE BYEON}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 54868 (WN{HANGUL SYLLABLE HWA}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) 000 0 00 00 000 0000 00 **→** 00 00 6000 -⊟ 3000 _¬

이 그래프는 연도별로 전 세계 사람들의 평균 소득과 평균 기대수명이 어떻게 변해왔는지를 보여줍니다. 파란색 선은 평균 소득을, 주황색 선은 평균 기대수명을 나타냅니다.

연도별 전 세계 평균 소득과 기대수명 변화 global_stats = df.groupby('Year').agg({ 'Spending_USD': 'mean', 'Life_Expectancy': 'mean'

fig, ax1 = plt.subplots(figsize=(14, 7))

ax1.set_title('연도별 전 세계 평균 소득과 기대수명 변화')

ax1.set_ylabel('평균 소득 (달러)')

global_stats['Spending_USD'].plot(kind='line', ax=ax1, color='blue', marker='o', label='평균 소득')

연도별 평균 소득 변화

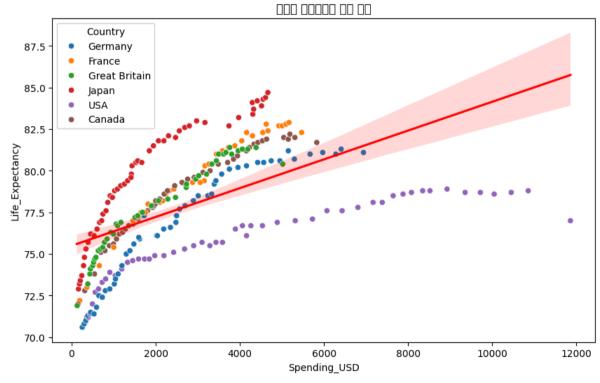
ax1.set_xlabel('연도')

소득과 기대수명 산점도 및 회귀선

(회귀선은 평균 소득과 평균 기대수명 간의 추세를 보여주는 선으로, 만약 회귀선이 상승하는 방향을 가리킨다면, 평균 소득이 증가할수록 평균 기 대수명도 증가한다는 의미입니다.)

소득과 기대수명 산점도 및 회귀선 plt.figure(figsize=(10, 6)) sns.scatterplot(x='Spending_USD', y='Life_Expectancy', hue='Country', data=df) sns.regplot(x='Spending_USD', y='Life_Expectancy', data=df, scatter=False, color='red') plt.title('소득과 기대수명의 상관 관계') plt.show()

fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46301 (WN{HANGUL SYLLABLE DEUG}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44284 (WN{HANGUL SYLLABLE GWA}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44592 (WN{HANGUL SYLLABLE GI}) missing from current font. fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45824 (\text{WN{HANGUL SYLLABLE DAE}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49688 (WN{HANGUL SYLLABLE SU}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 47749 (WN{HANGUL SYLLABLE MYEONG}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 51032 (WN{HANGUL SYLLABLE YI}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49345 (WN{HANGUL SYLLABLE SANG}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44288 (WN{HANGUL SYLLABLE GWAN}) missing from current font. fig.canvas.print_figure(bytes_io, **kw) /usr/local/lib/python3.10/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 44228 (WN{HANGUL SYLLABLE GYE}) missing from current font. fig.canvas.print_figure(bytes_io, **kw)



상관 계수 계산 correlation = df[['Spending_USD', 'Life_Expectancy']].corr() corr_value = correlation.loc['Spending_USD', 'Life_Expectancy']

상관 계수 해석 및 설명 출력 def interpret_correlation(value): if value > 0.7:

return "강한 양의 상관 관계 (소득이 높을수록 기대수명이 높음)" elif value > 0.3:

return "중간 정도의 양의 상관 관계 (소득이 높을수록 기대수명이 높아지는 경향이 있음)"

elif value > 0: return "약한 양의 상관 관계 (소득이 높을수록 기대수명이 약간 높아지는 경향이 있음)" elif value > -0.3: return "약한 음의 상관 관계 (소득이 높을수록 기대수명이 약간 낮아지는 경향이 있음)"

elif value > -0.7: return "중간 정도의 음의 상관 관계 (소득이 높을수록 기대수명이 낮아지는 경향이 있음)" return "강한 음의 상관 관계 (소득이 높을수록 기대수명이 낮음)"

correlation_explanation = interpret_correlation(corr_value)

print("소득과 기대수명의 상관 계수: {:.2f}".format(corr_value)) print("해석: " + correlation_explanation)

소득과 기대수명의 상관 계수: 0.58 해석: 중간 정도의 양의 상관 관계 (소득이 높을수록 기대수명이 높아지는 경향이 있음)

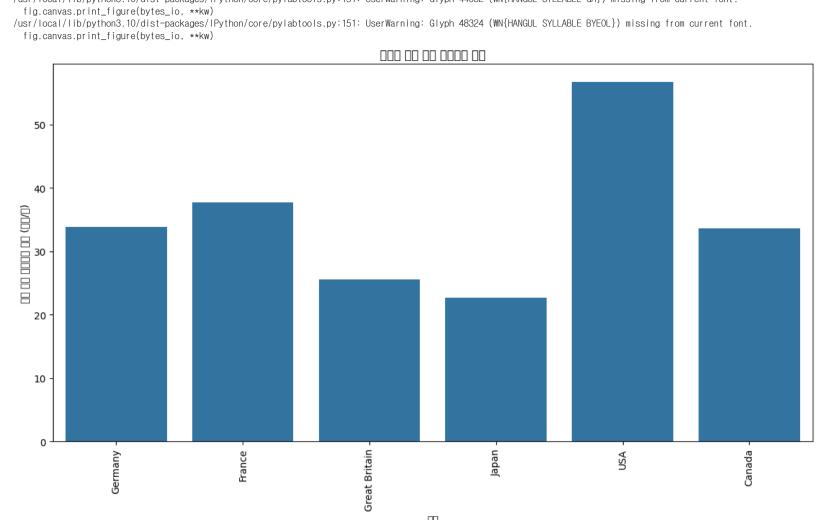
소득과 기대수명의 비율 계산 및 비교

(이 그래프는 각 국가별 소득 대비 기대수명의 비율을 보여줍니다. 즉, 각 국가에서 1년 동안 번 돈으로 몇 년을 살 수 있는지를 나타냅니다. 예를 들 어, 비율이 높을수록 소득에 비해 기대수명이 짧다는 것을 의미합니다.)

소득과 기대수명의 비율 계산 및 비교 df['Income_Life_Expectancy_Ratio'] = df['Spending_USD'] / df['Life_Expectancy'] plt.figure(figsize=(14, 7)) sns.barplot(x='Country', y='Income_Life_Expectancy_Ratio', data=df, estimator='mean', ci=None) plt.title('국가별 소득 대비 기대수명 비율') plt.ylabel('소득 대비 기대수명 비율 (달러/년)') plt.xlabel('국가') plt.xticks(rotation=90)

plt.show() print("이 그래프는 각 국가별 소득 대비 기대수명의 비율을 보여줍니다. 즉, 각 국가에서 1년 동안 번 돈으로 몇 년을 살 수 있는지를 나타냅니다. 예를 들어, 비율이 높을수록 소득에 비해 기대수명이 짧다는 것을 의미합니다.") The `ci` parameter is deprecated. Use `errorbar=None` for the same effect.

sns.barplot(x='Country', y='Income_Life_Expectancy_Ratio', data=df, estimator='mean', ci=None)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 49548 (WN{HANGUL SYLLABLE SO}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 45824 (WN{HANGUL SYLLABLE DEUG}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 45824 (WN{HANGUL SYLLABLE DAE}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 45708 (WN{HANGUL SYLLABLE BI}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 44592 (WN{HANGUL SYLLABLE GI}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 44592 (WN{HANGUL SYLLABLE SU}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 47749 (WN{HANGUL SYLLABLE MYEONG}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 45804 (WN{HANGUL SYLLABLE MYEONG}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 45804 (WN{HANGUL SYLLABLE MYEONG}) missing from current font.
fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.10/dist-packages/lPython/core/pylabtools.py:151: UserWarning: Glyph 47084 (WN{HANGUL SYLLABLE NYEON}) missing from current font.
fig.can



UI 이 그래프는 각 국가별 소득 대비 기대수명의 비율을 보여줍니다. 즉, 각 국가에서 1년 동안 번 돈으로 몇 년을 살 수 있는지를 나타냅니다. 예를 들어, 비율이 높을수록 소득에 비해 기대수명이 짧다는 것을 의미합니다.