Tarea M24 / Bryan Alberto Coronado García EBAC

- Se verificó y realizaron ajustes a la codificación del CSV para su correcta carga.

```
# Importacion del CSV a trabajar y las respectivas librerías.

import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df = pd.read_csv("SYB66_246_202310_Population Growth, Fertility and Mortality Indicators.csv")
df.head()
```

	Region/Country/Area	Unnamed: 1	Year	Series	Value	Footnotes	Source
0	1	Total, all countries or areas	2010	Population annual rate of increase (percent)	1.3	NaN	United Nations Population Division, New York, ...
1	1	Total, all countries or areas	2010	Total fertility rate (children per women)	2.6	NaN	United Nations Population Division, New York, ...
2	1	Total, all countries or areas	2010	Infant mortality for both sexes (per 1,000 liv...	37.1	NaN	United Nations Statistics Division, New York, ...
3	1	Total, all countries or areas	2010	Maternal mortality ratio (deaths per 100,000 p...	254	NaN	World Health Organization (WHO), the United Na...
4	1	Total, all countries or areas	2010	Life expectancy at birth for both sexes (years)	70.1	NaN	United Nations Population Division, New York, ...

- Filtro de carga al año 2020

```
# Filtración por año 2020

datos_2020 = df['Year'] == 2020

df_2020 = df[datos_2020]
df_2020.head(50)
```

	Region/Country/Area	Unnamed: 1	Year	Series	Value	Footnotes	Source
14	1	Total, all countries or areas	2020	Population annual rate of increase (percent)	0.9	NaN	United Nations Population Division, New York, ...
15	1	Total, all countries or areas	2020	Total fertility rate (children per women)	2.3	NaN	United Nations Population Division, New York, ...
16	1	Total, all countries or areas	2020	Infant mortality for both sexes (per 1,000 liv...	28.3	NaN	United Nations Statistics Division, New York, ...
17	1	Total, all countries or areas	2020	Maternal mortality ratio (deaths per 100,000 p...	223	NaN	World Health Organization (WHO), the United Na...
18	1	Total, all countries or areas	2020	Life expectancy at birth for both sexes (years)	72	NaN	United Nations Population Division, New York, ...
19	1	Total, all countries or areas	2020	Life expectancy at birth for males (years)	69.4	NaN	United Nations Population Division, New York, ...
20	1	Total, all countries or areas	2020	Life expectancy at birth for females (years)	74.8	NaN	United Nations Population Division, New York, ...

- Filtro de mortalidad y natalidad

```
# Filtrado por filas solicitadas

df_filtrado = df_2020[df_2020['Series'].isin(['Infant mortality for both sexes (per 1,000 live births)', 'Life expectancy at birth for both sexes (years)'])]
df_filtrado.head(30)
```

	Region/Country/Area	Unnamed: 1	Year	Series	Value	Footnotes	Source
16	1	Total, all countries or areas	2020	Infant mortality for both sexes (per 1,000 liv...	28.3	NaN	United Nations Statistics Division, New York, ...
18	1	Total, all countries or areas	2020	Life expectancy at birth for both sexes (years)	72	NaN	United Nations Population Division, New York, ...
43	2	Africa	2020	Infant mortality for both sexes (per 1,000 liv...	46.4	NaN	United Nations Statistics Division, New York, ...
45	2	Africa	2020	Life expectancy at birth for both sexes (years)	62.2	NaN	United Nations Population Division, New York, ...
70	15	Northern Africa	2020	Infant mortality for both sexes (per 1,000 liv...	22.6	NaN	United Nations Statistics Division, New York, ...

- Extracción de datos necesarios para su valoración

```
# Filtro final para elaboración gráfica

df_final = df_filtrado[['Region/Country/Area', 'Year', 'Series', 'Value']]
df_final.head()
```

	Region/Country/Area	Year	Series	Value
16	1	2020	Infant mortality for both sexes (per 1,000 liv...	28.3
18	1	2020	Life expectancy at birth for both sexes (years)	72
43	2	2020	Infant mortality for both sexes (per 1,000 liv...	46.4
45	2	2020	Life expectancy at birth for both sexes (years)	62.2
70	15	2020	Infant mortality for both sexes (per 1,000 liv...	22.6

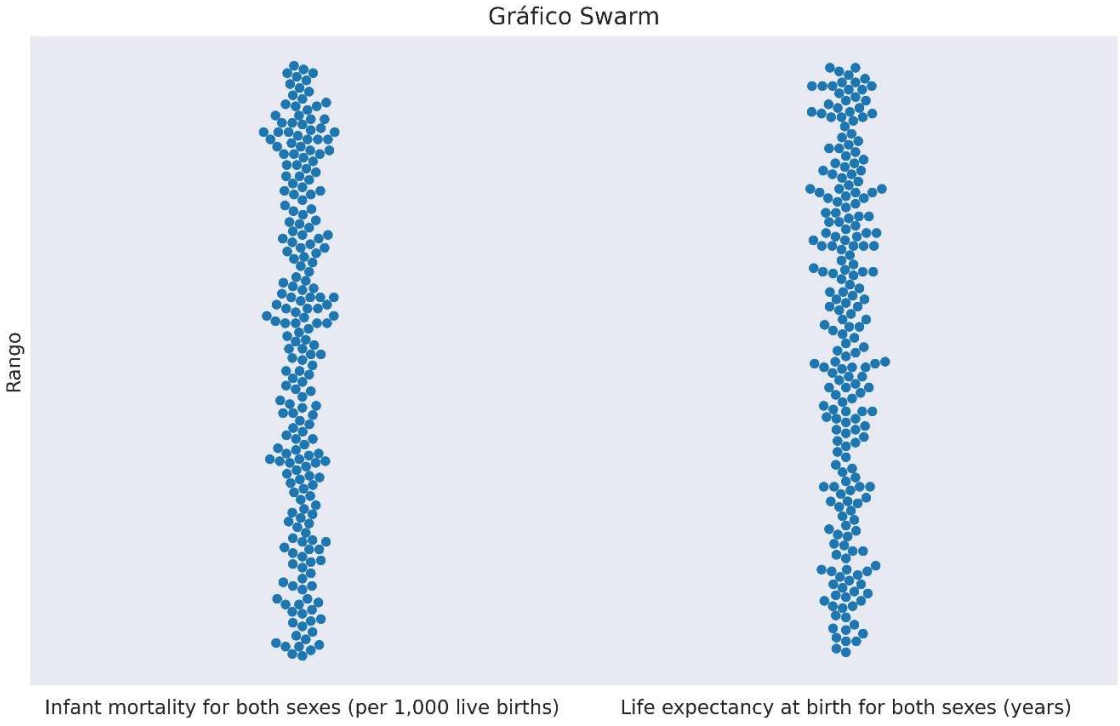
- Generación de gráficos tipo ‘swarm’ y ‘violin’

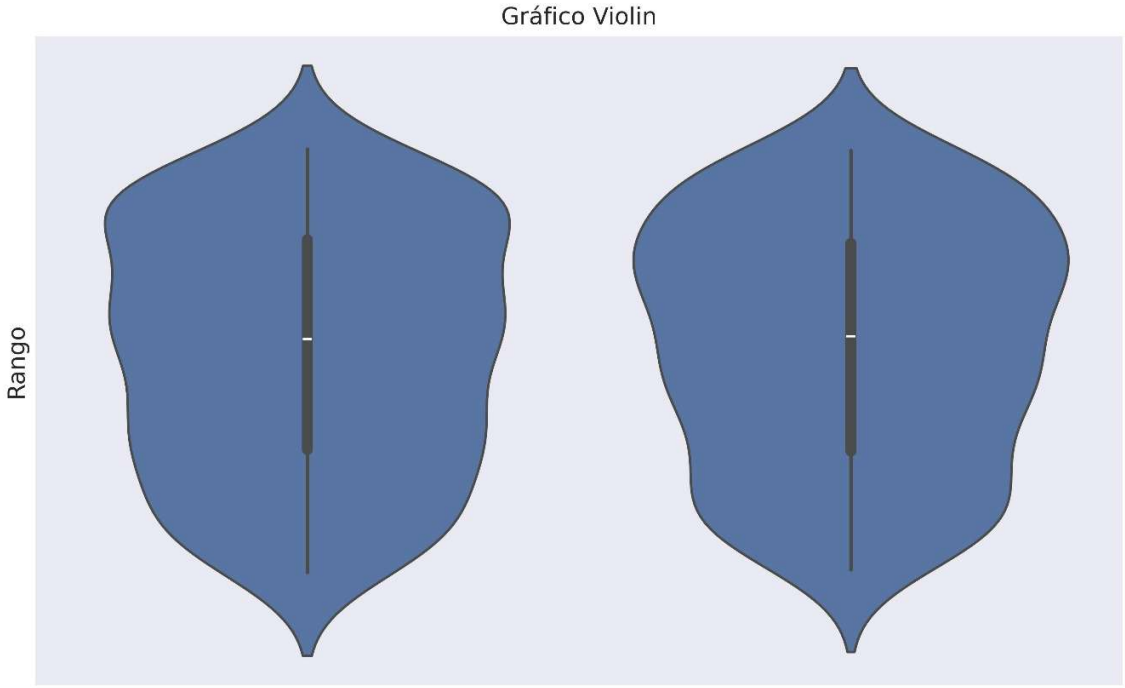
```
# Gráfico tipo 'Swarm'

fix, ax = plt.subplots(figsize=(10, 6))
sns.swarmplot(data=df_final, x='Series', y='Value')
sns.set_style("darkgrid")
sns.despine(left=True, bottom=True)
ax.axes.yaxis.set_ticks([])
ax.set_xlabel('')
ax.set_ylabel('Rango')
plt.title('Gráfico Swarm')
plt.savefig('gráfico_swarm.jpg', dpi = 500)
```

```
# Gráfico tipo 'Violin'

fix, ax = plt.subplots(figsize=(10, 6))
sns.violinplot(data=df_final, x='Series', y='Value')
sns.set_style("darkgrid")
sns.despine(left=True, bottom=True)
ax.axes.yaxis.set_ticks([])
ax.set_xlabel('')
ax.set_ylabel('Rango')
plt.title('Gráfico Violin')
plt.savefig('Gráfico Violin.jpg', dpi = 500)
```

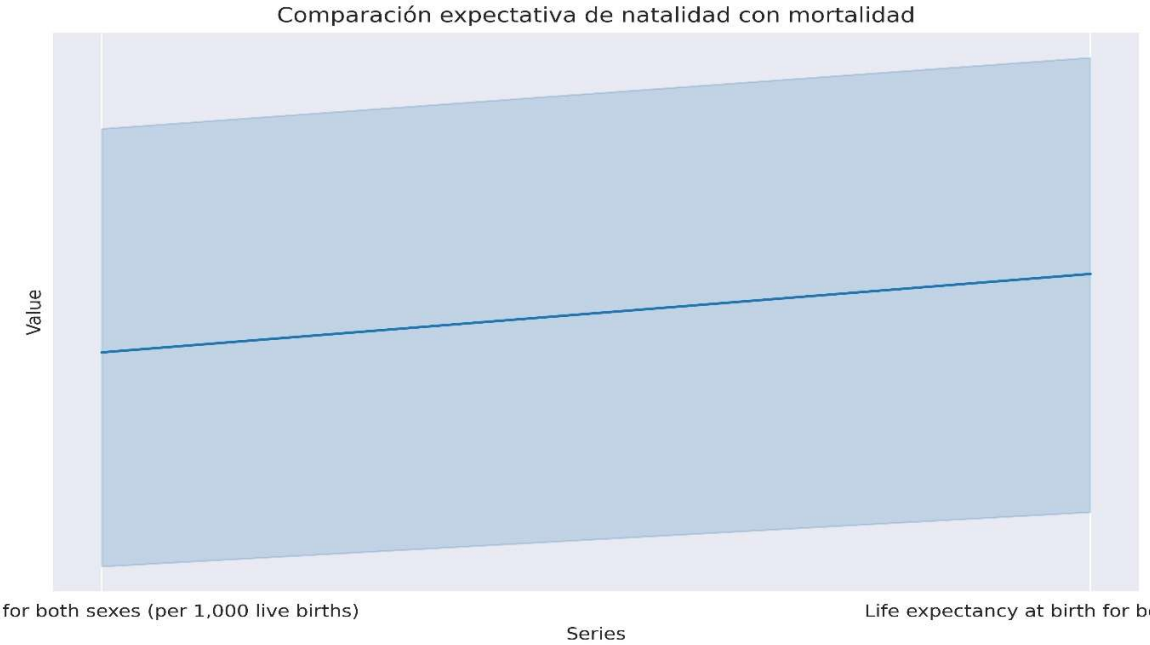




- Gráfico ‘lineplot’ para comparación de rangos promedio

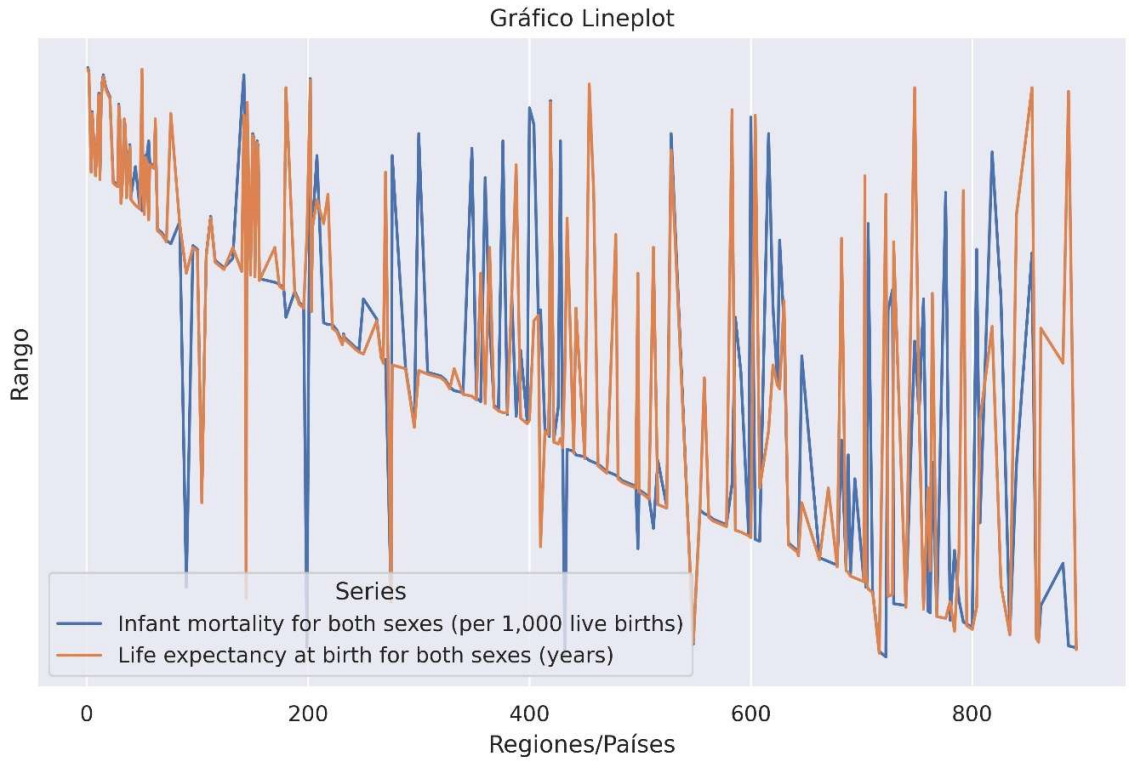
```
[21] # Gráfico tipo 'Line'

     fix, ax = plt.subplots(figsize=(10, 6))
     sns.lineplot(data=df_final, x='Series', y='Value')
     ax.axes.yaxis.set_ticks([])
     plt.title('Comparación expectativa de natalidad con mortalidad')
     plt.savefig('gráfico_line.jpg', dpi = 500)
```



- Gráfico para comparación de mortalidad y natalidad gestionado por regiones

```
fix, ax = plt.subplots(figsize=(10, 6))
sns.lineplot(data=df_final, x='Region/Country/Area', y='Value', hue='Series')
sns.set_style("darkgrid")
sns.despine(left=True, bottom=True)
ax.axes.yaxis.set_ticks([])
ax.set_xlabel('Regiones/Países')
ax.set_ylabel('Rango')
plt.title('Gráfico Lineplot')
plt.savefig('Gráfico Lineplot.jpg', dpi = 500)
```



Insights finales:

- Con la verificación de los gráficos es posible deducir que existe una inclinación mayor a la natalidad promedio que a la mortalidad. Indicando esto que la población general tiene una tendencia al crecimiento.
- Se hace hincapié en que la mortalidad es claramente mayor en las últimas regiones, las cuales contienen una menor población, concluyendo con un posible problema que puede abarcar distintos factores, como menor calidad de sistema de salud, y menor calidad de vida.
- Es posible notar que a pesar de la variación de ambas variables en ciertas regiones según si el promedio continúa siendo bastante similar y la dispersión según el gráfico swarm llega a tener más concentrados sus promedios en la mortalidad, es decir, que a términos generales la motalidad tiene mayor tendencia a ser similar en la mayoría de los países.