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Visualización de la Información - 3 Análisis de precios de un producto: graficas para presentación.

📑 3 Análisis de precios de un producto: graficas para presentación.

3 Análisis de precios de un producto: graficas para presentación.

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Trabajo realizado con el apoyo del Programa UNAM-DGAPA-PAPIME PE101922

3.0.1 Contar la historia final

```python
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

# Parámetros para el estilo de las gráficas
params = {'figure.figsize' : (10,5),
          'xtick.labelsize': 16,
          'ytick.labelsize': 16,
          'axes.labelsize' : 20,
          'axes.titlesize' : 20,
          'legend.fontsize': 14,
          'grid.color'     : 'darkgray',
          'grid.linewidth' : 0.5,
          'grid.linestyle' : '--',
          'font.family': 'DejaVu Serif',
         }
plt.rcParams.update(params)
```

```python
precios = pd.read_excel("Libro1.xlsx", index_col=0)
precios
```

	2013	2014	2015	2016	2017	2018	2019
Prod A	395.0	420.0	430.0	390.0	300.0	275	260
Prod B	370.0	400.0	405.0	380.0	295.0	255	245
Prod C	NaN	NaN	100.0	180.0	200.0	240	182
Prod D	NaN	NaN	NaN	160.0	265.0	215	210
Prod E	NaN	NaN	NaN	NaN	NaN	100	205

```python
A = np.array(precios.iloc[0])
B = np.array(precios.iloc[1])
C = np.array(precios.iloc[2])
D = np.array(precios.iloc[3])
```

```
        E = np.array(precios.iloc[4])
        print(A)
        print(B)
        print(C)
        print(D)
        print(E)
```

```
[395. 420. 430. 390. 300. 275. 260.]
[370. 400. 405. 380. 295. 255. 245.]
[ nan  nan 100. 180. 200. 240. 182.]
[ nan  nan  nan 160. 265. 215. 210.]
[ nan  nan  nan  nan  nan 100. 205.]
```

```
        # Arreglo para usarse en el eje x
        x2 = np.arange(2013,2020,1)
        x2
```

```
array([2013, 2014, 2015, 2016, 2017, 2018, 2019])
```

```
        fig = plt.figure() # Se define una figura
        ax = fig.gca()      # Se obtienen los ejes de la figura

        # Producto A
        ax.scatter(x2[0], A[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

        # Producto B
        ax.scatter(x2[0], B[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

        # Límites en el eje y
        ax.set_ylim(0,500)
        ax.set_xlim(2012.5,2019.5)

        # Marcas sobre los ejes (ojo: ya no hacen falta los xticks)
        ax.set_xticks(ticks=[i for i in range(2013,2020)])
        ax.set_yticks(ticks=[0,100,200,300,400,500],
                      labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

        # Rejilla
        ax.grid()

        ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
        ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)

        ax.spines['right'].set_visible(False)
        ax.spines['top'].set_visible(False)
        ax.spines['left'].set_color('gray')
        ax.spines['bottom'].set_color('gray')
        ax.tick_params(axis='x', colors='#444444')
        ax.tick_params(axis='y', colors='#444444')
```
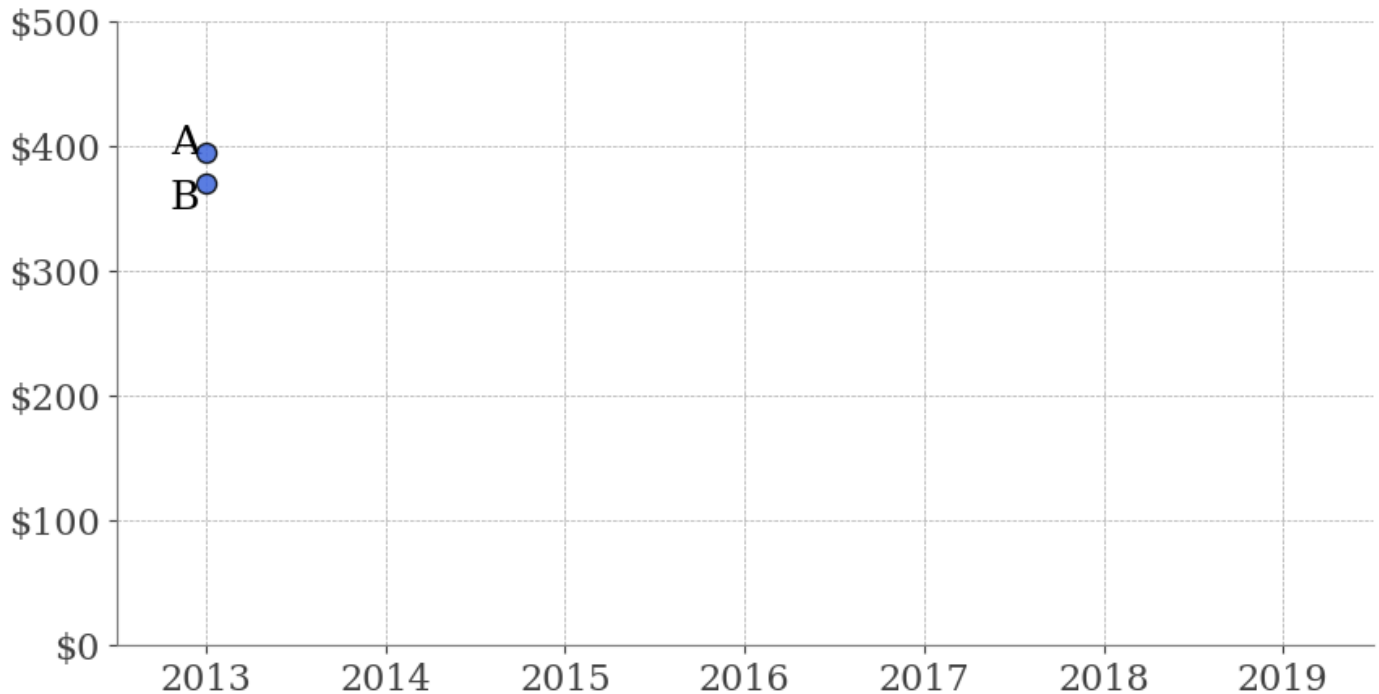
```
plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
plt.savefig('vis1.png',bbox_inches='tight', dpi=150)
plt.show()
```

Precio promedio por año


```
# Visualización 12: usamos líneas con color
fig = plt.figure() # Se define una figura
ax = fig.gca()     # Se obtienen los ejes de la figura

# Producto A
ax.plot(x2, A, lw=3, c='darkgray')
ax.scatter(x2[0], A[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='
ax.scatter(x2[-1], A[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto B
ax.plot(x2, B, lw=3, c='darkgray')
ax.scatter(x2[0], B[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='
ax.scatter(x2[-1], B[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Límites en el eje y
ax.set_ylim(0,500)
ax.set_xlim(2012.5,2019.5)

# Marcas sobre los ejes (ojo: ya no hacen falta los xticks)
ax.set_xticks(ticks=[i for i in range(2013,2020)])
ax.set_yticks(ticks=[0,100,200,300,400,500],
```

```
                                labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

            # Rejilla
            ax.grid()

            ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
            ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)

            ax.spines['right'].set_visible(False)
            ax.spines['top'].set_visible(False)
            ax.spines['left'].set_color('gray')
            ax.spines['bottom'].set_color('gray')
            ax.tick_params(axis='x', colors='#444444')
            ax.tick_params(axis='y', colors='#444444')

            plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
            plt.savefig('vis2.png',bbox_inches='tight', dpi=150)
            plt.show()
```
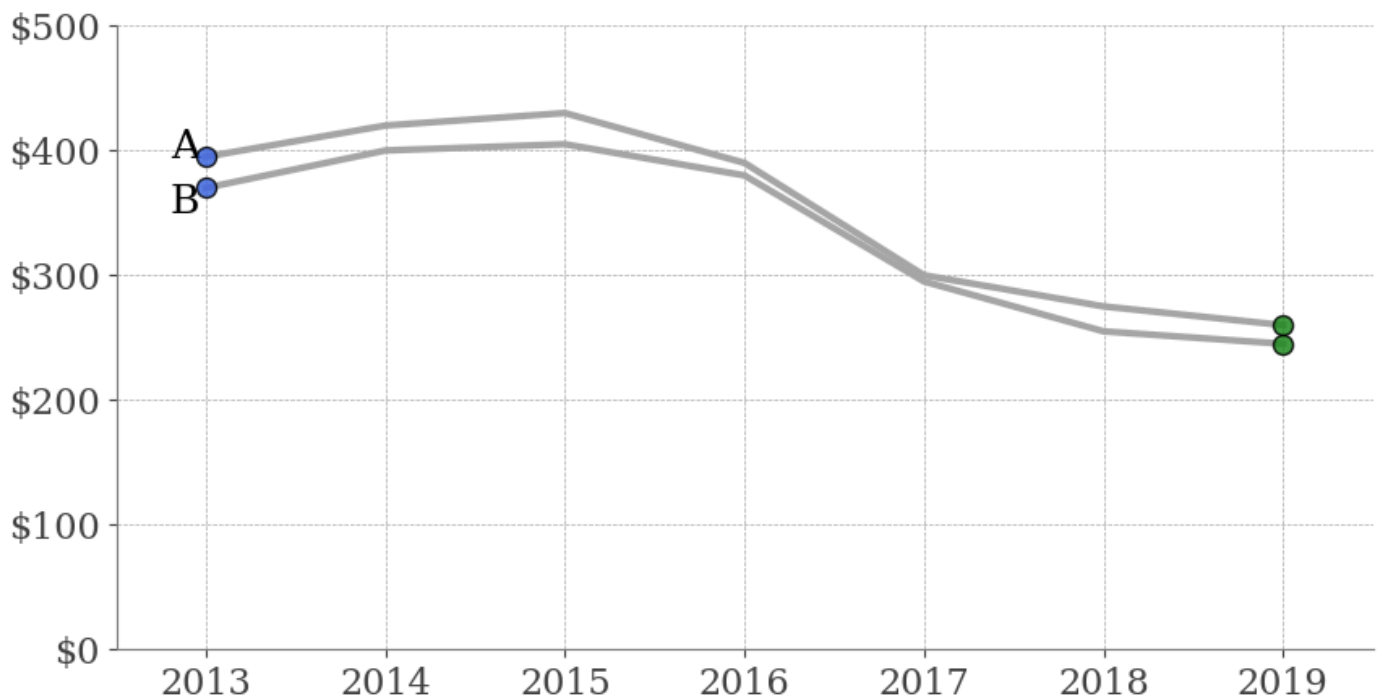
Precio promedio por año


```
            fig = plt.figure() # Se define una figura
            ax = fig.gca()     # Se obtienen los ejes de la figura

            # Producto A
            ax.plot(x2, A, lw=3, c='darkgray')
            ax.scatter(x2[0], A[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='
```

```python
# Producto B
ax.plot(x2, B, lw=3, c='darkgray')
ax.scatter(x2[0], B[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto C
ax.scatter(x2[2], C[2], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto D
ax.scatter(x2[3], D[3], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto E
ax.scatter(x2[5], E[5], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Límites en los ejes
ax.set_ylim(0,500)
ax.set_xlim(2012.5,2019.5)

# Marcas sobre los ejes
ax.set_xticks(ticks=[i for i in range(2013,2020)])
ax.set_yticks(ticks=[0,100,200,300,400,500],
              labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

# Rejilla
ax.grid()

ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)
ax.text(x = x2[2]-0.20, y = C[2]-20, s = 'C', fontsize = 18)
ax.text(x = x2[3]-0.20, y = D[3]-20, s = 'D', fontsize = 18)
ax.text(x = x2[5]-0.20, y = E[5]-20, s = 'E', fontsize = 18)

ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
ax.spines['left'].set_color('gray')
ax.spines['bottom'].set_color('gray')
ax.tick_params(axis='x', colors='#444444')
ax.tick_params(axis='y', colors='#444444')

plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
plt.savefig('vis3.png',bbox_inches='tight', dpi=150)
plt.show()
```
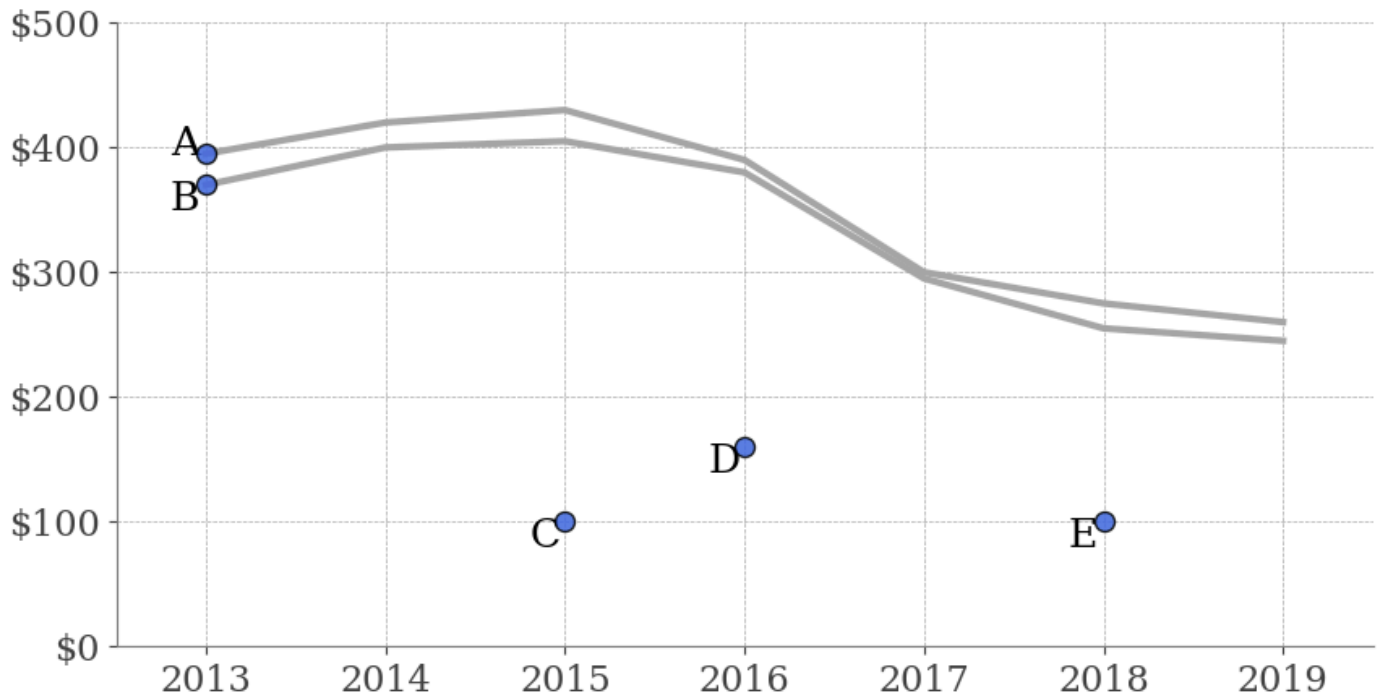
Precio promedio por año


```
# Visualización 8: usamos líneas con color
fig = plt.figure() # Se define una figura
ax = fig.gca()     # Se obtienen los ejes de la figura

# Producto A
ax.plot(x2[0:3], A[0:3], lw=3, color='firebrick')
ax.scatter(x2[0], A[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto B
ax.plot(x2[0:3], B[0:3], lw=3, color='firebrick')
ax.scatter(x2[0], B[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto C
ax.plot(x2[2:6], C[2:6], lw=3, color='firebrick')
ax.scatter(x2[2], C[2], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto D
ax.plot(x2[3:5], D[3:5], lw=3, color='firebrick')
ax.scatter(x2[3], D[3], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto E
ax.plot(x2, E, lw=3, c='firebrick')
ax.scatter(x2[5], E[5], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Límites en los ejes
ax.set_ylim(0,500)
```

```python
ax.set_xlim(2012.5,2019.5)

# Marcas sobre los ejes
ax.set_xticks(ticks=[i for i in range(2013,2020)])
ax.set_yticks(ticks=[0,100,200,300,400,500],
              labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

# Rejilla
ax.grid()

ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)
ax.text(x = x2[2]-0.20, y = C[2]-20, s = 'C', fontsize = 18)
ax.text(x = x2[3]-0.20, y = D[3]-20, s = 'D', fontsize = 18)
ax.text(x = x2[5]-0.20, y = E[5]-20, s = 'E', fontsize = 18)

ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
ax.spines['left'].set_color('gray')
ax.spines['bottom'].set_color('gray')
ax.tick_params(axis='x', colors='#444444')
ax.tick_params(axis='y', colors='#444444')

plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
plt.savefig('vis4.png',bbox_inches='tight', dpi=150)
plt.show()
```
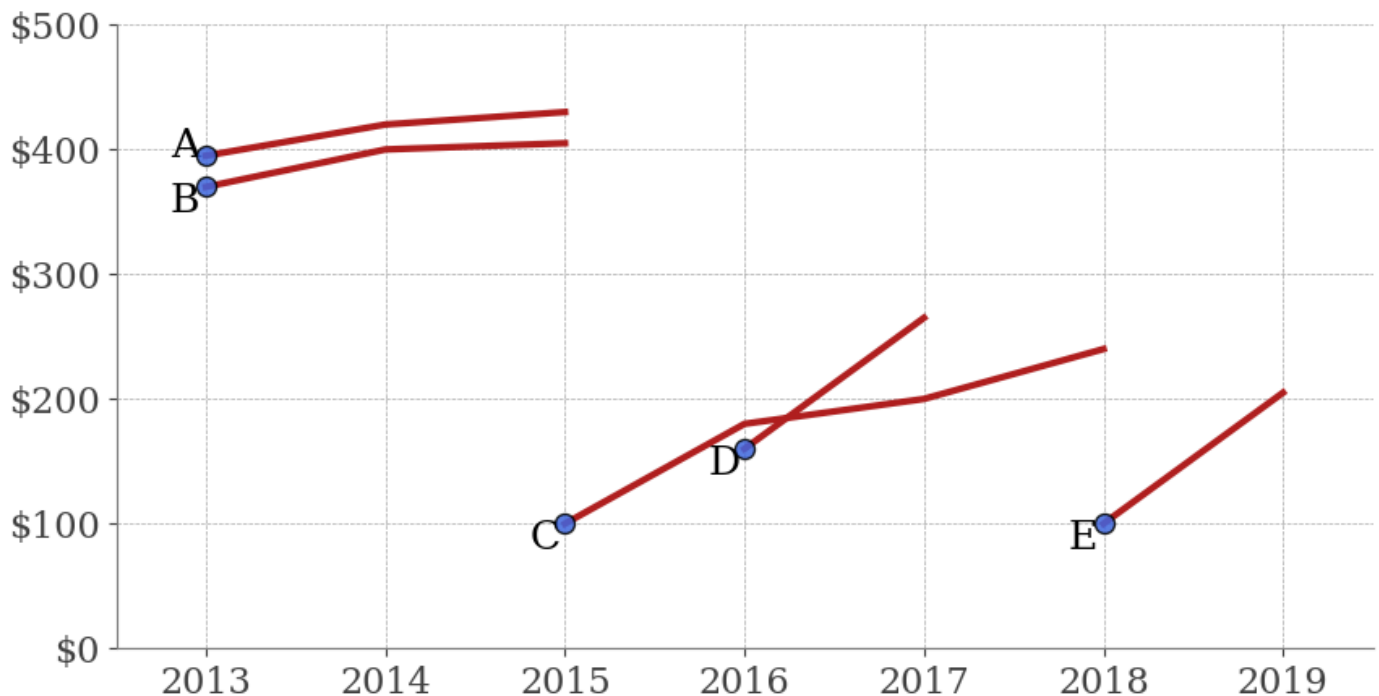

Precio promedio por año

```python
fig = plt.figure() # Se define una figura
ax = fig.gca()     # Se obtienen los ejes de la figura

# Producto A
ax.plot(x2[2:], A[2:], lw=3, color='royalblue')
ax.plot(x2[0:3], A[0:3], lw=3, color='firebrick')
ax.scatter(x2[0], A[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto B
ax.plot(x2[2:], B[2:], lw=3, color='royalblue')
ax.plot(x2[0:3], B[0:3], lw=3, color='firebrick')
ax.scatter(x2[0], B[0], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto C
ax.plot(x2[5:], C[5:], lw=3, color='royalblue')
ax.plot(x2[2:6], C[2:6], lw=3, color='firebrick')
ax.scatter(x2[2], C[2], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto D
ax.plot(x2[4:], D[4:], lw=3, color='royalblue')
ax.plot(x2[3:5], D[3:5], lw=3, color='firebrick')
ax.scatter(x2[3], D[3], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Producto E
ax.plot(x2, E, lw=3, c='firebrick')
ax.scatter(x2[5], E[5], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color='

# Límites en los ejes
ax.set_ylim(0,500)
ax.set_xlim(2012.5,2019.5)

# Marcas sobre los ejes
ax.set_xticks(ticks=[i for i in range(2013,2020)])
ax.set_yticks(ticks=[0,100,200,300,400,500],
              labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

# Rejilla
ax.grid()

ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)
ax.text(x = x2[2]-0.20, y = C[2]-20, s = 'C', fontsize = 18)
ax.text(x = x2[3]-0.20, y = D[3]-20, s = 'D', fontsize = 18)
ax.text(x = x2[5]-0.20, y = E[5]-20, s = 'E', fontsize = 18)

ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
ax.spines['left'].set_color('gray')
ax.spines['bottom'].set_color('gray')
ax.tick_params(axis='x', colors='#444444')
```
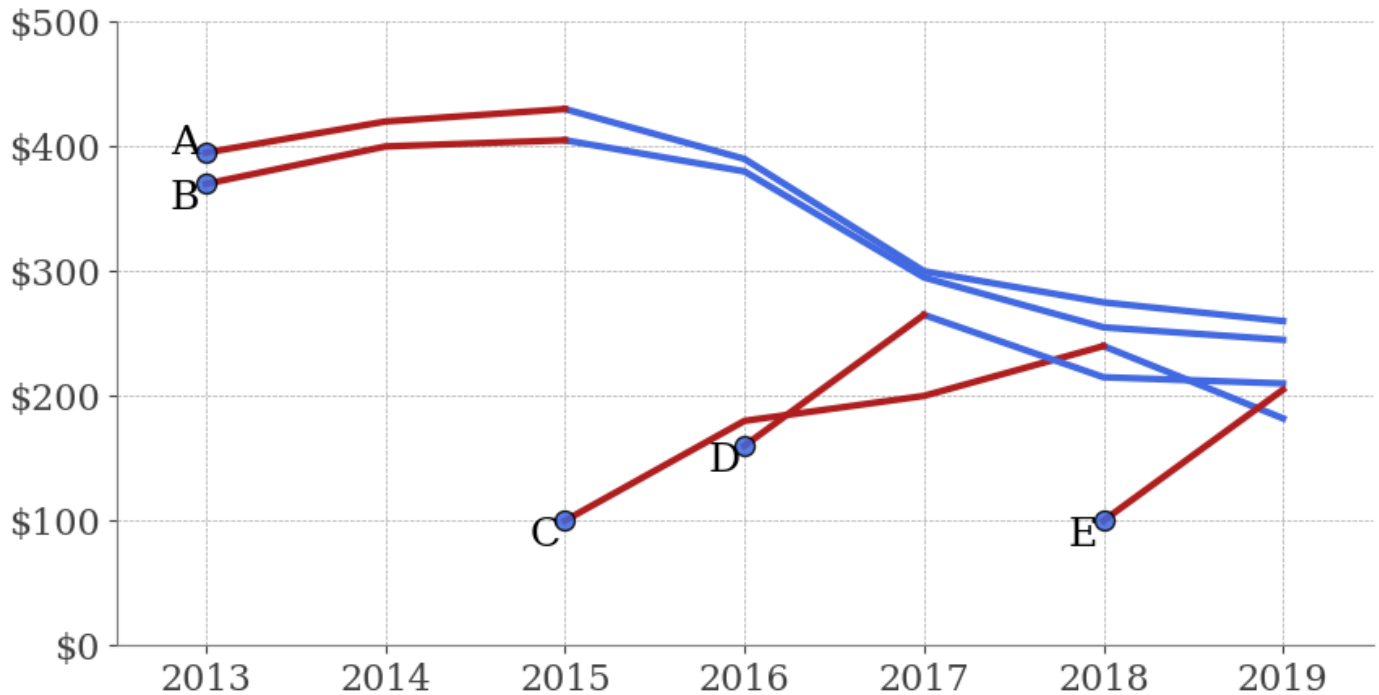
```
ax.tick_params(axis='y', colors='#444444')

plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
plt.savefig('vis5.png',bbox_inches='tight', dpi=150)
plt.show()
```

Precio promedio por año


```
# Visualización 11: marcamos el rango de precios de introducción
fig = plt.figure() # Se define una figura
ax = fig.gca()     # Se obtienen los ejes de la figura

# Producto A
ax.plot(x2, A, lw=3, c='darkgray')
ax.scatter(x2[-1], A[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto B
ax.plot(x2, B, lw=3, c='darkgray')
ax.scatter(x2[-1], B[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto C
ax.plot(x2, C, lw=3, c='darkgray')
ax.scatter(x2[-1], C[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto D
ax.plot(x2, D, lw=3, c='darkgray')
ax.scatter(x2[-1], D[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color
```

```python
# Producto E
ax.plot(x2, E, lw=3, c='darkgray')
ax.scatter(x2[-1], E[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Promedio final
precios_finales = np.array([A[-1], B[-1], C[-1], D[-1], E[-1],])
promedio_final = np.mean(precios_finales)
ax.scatter(x2[-1], promedio_final, marker='<', alpha=0.85, ec = 'k', s=75,
           zorder=5, color='orange', label='Promedio')

# Límites en los ejes
ax.set_ylim(0,500)
ax.set_xlim(2012.5,2019.5)

# Marcas sobre los ejes
ax.set_xticks(ticks=[i for i in range(2013,2020)])
ax.set_yticks(ticks=[0,100,200,300,400,500],
              labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

# Rejilla
ax.grid()

ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)
ax.text(x = x2[2]-0.20, y = C[2]-20, s = 'C', fontsize = 18)
ax.text(x = x2[3]-0.20, y = D[3]-20, s = 'D', fontsize = 18)
ax.text(x = x2[5]-0.20, y = E[5]-20, s = 'E', fontsize = 18)

ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
ax.spines['left'].set_color('gray')
ax.spines['bottom'].set_color('gray')
ax.tick_params(axis='x', colors='#444444')
ax.tick_params(axis='y', colors='#444444')

plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
plt.legend(loc='lower right')
plt.savefig('vis6.png',bbox_inches='tight', dpi=150)
plt.show()
```
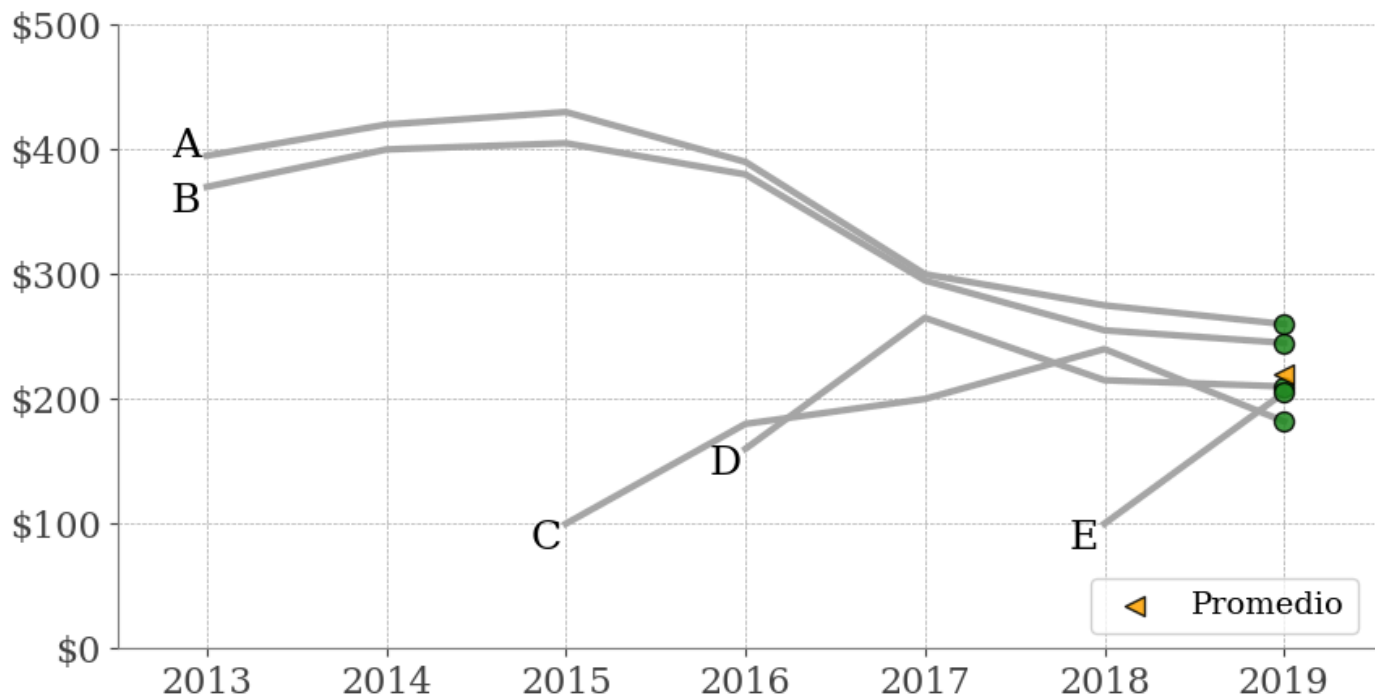
Precio promedio por año


```
# Visualización 11: marcamos el rango de precios de introducción
fig = plt.figure() # Se define una figura
ax = fig.gca()      # Se obtienen los ejes de la figura

# Producto A
ax.plot(x2, A, lw=3, c='darkgray')
ax.scatter(x2[-1], A[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto B
ax.plot(x2, B, lw=3, c='darkgray')
ax.scatter(x2[-1], B[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto C
ax.plot(x2, C, lw=3, c='darkgray')
ax.scatter(x2[-1], C[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto D
ax.plot(x2, D, lw=3, c='darkgray')
ax.scatter(x2[-1], D[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Producto E
ax.plot(x2, E, lw=3, c='darkgray')
ax.scatter(x2[-1], E[-1], marker='o', alpha=0.85, ec = 'k', s=75, zorder=5, color

# Promedio final
precios_finales = np.array([A[-1], B[-1], C[-1], D[-1], E[-1],])
```

```python
promedio_final = np.mean(precios_finales)
ax.scatter(x2[-1], promedio_final, marker='<', alpha=0.85, ec = 'k', s=75,
           zorder=5, color='orange', label='Promedio')

# Límites en los ejes
ax.set_ylim(0,500)
ax.set_xlim(2012.5,2019.5)

# Marcas sobre los ejes
ax.set_xticks(ticks=[i for i in range(2013,2020)])
ax.set_yticks(ticks=[0,100,200,300,400,500],
              labels=['\$0','\$100','\$200','\$300','\$400','\$500'])

# Rejilla
ax.grid()

# Etiquetado de cada línea
ax.text(x = x2[0]-0.20, y = A[0], s = 'A', fontsize = 18)
ax.text(x = x2[0]-0.20, y = B[0]-20, s = 'B', fontsize = 18)
ax.text(x = x2[2]-0.20, y = C[2]-20, s = 'C', fontsize = 18)
ax.text(x = x2[3]-0.20, y = D[3]-20, s = 'D', fontsize = 18)
ax.text(x = x2[5]-0.20, y = E[5]-20, s = 'E', fontsize = 18)

# Eliminación de algunas líneas del recuadro
ax.spines['right'].set_visible(False)
ax.spines['top'].set_visible(False)
ax.spines['left'].set_color('gray')
ax.spines['bottom'].set_color('gray')

# Color de los ticks
ax.tick_params(axis='x', colors='#444444')
ax.tick_params(axis='y', colors='#444444')

# Recuadro para indicar la región del precio final
left, bottom, width, height = (2012, 150, 8, 50)
rect = plt.Rectangle((left, bottom), width, height,
                     facecolor="black", alpha=0.1)
ax.add_patch(rect)
ax.text(x = x2[0]-0.25, y = 165, s = 'Rango de precios de introducción', fontsize

plt.suptitle('Precio promedio por año', fontsize=24, x =0.275, y=1.05)
plt.legend(loc='lower right')
plt.savefig('vis_final.png',bbox_inches='tight', dpi=150)
plt.show()
```

Precio promedio por año