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# 1. Biblioteka Matplotlib

# 1.1 Wykres liniowy z linią przerywaną

import pandas as pd
import matplotlib.pyplot as plt

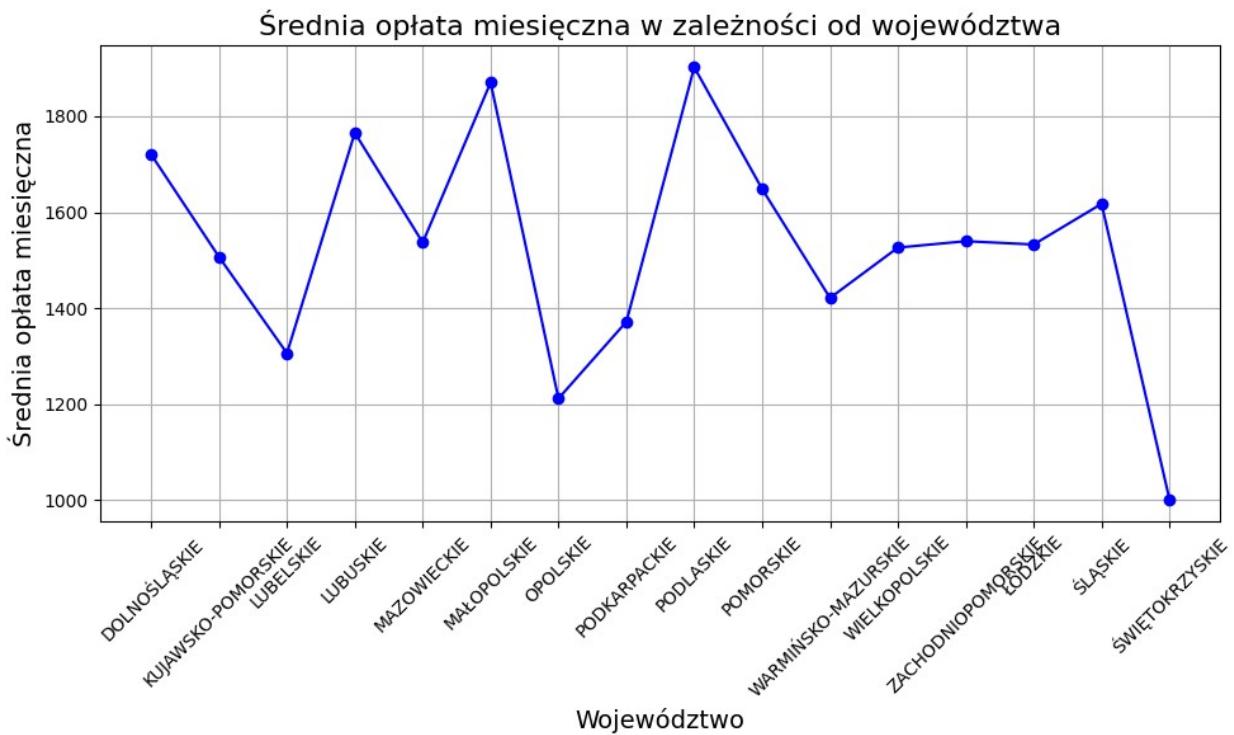
df = pd.read_csv("RZ-opiekunowie.csv")

df['Opłata miesięczna za pobyt'] = pd.to_numeric(df['Opłata miesięczna za pobyt'].str.replace(' zł', ''), errors='coerce')
avg_oplata_miesieczna = df.groupby('Województwo')['Opłata miesięczna za pobyt'].mean().reset_index()
avg_oplata_miesieczna =
avg_oplata_miesieczna[avg_oplata_miesieczna['Opłata miesięczna za pobyt'].notna()]

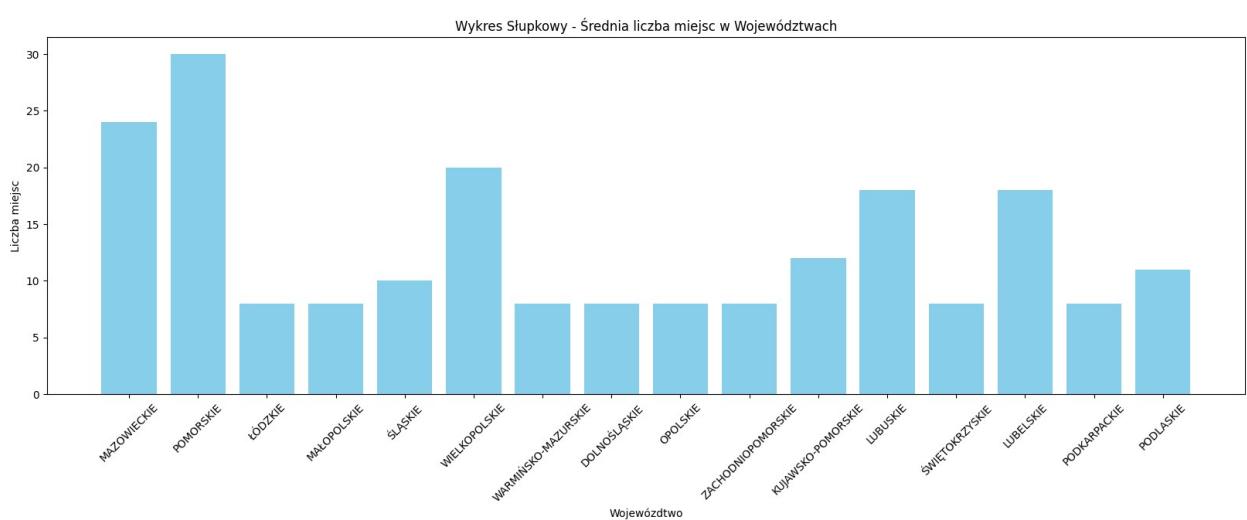
# Tworzenie wykresu liniowego
fig, ax = plt.subplots(figsize=(10, 6))
ax.plot(avg_oplata_miesieczna['Województwo'],
        avg_oplata_miesieczna['Opłata miesięczna za pobyt'], marker='o',
        color='blue')

# Dodanie tytułu i etykiety osi
ax.set_title('Średnia opłata miesięczna w zależności od województwa',
              fontsize=16)
ax.set_xlabel('Województwo', fontsize=14)
ax.set_ylabel('Średnia opłata miesięczna', fontsize=14)

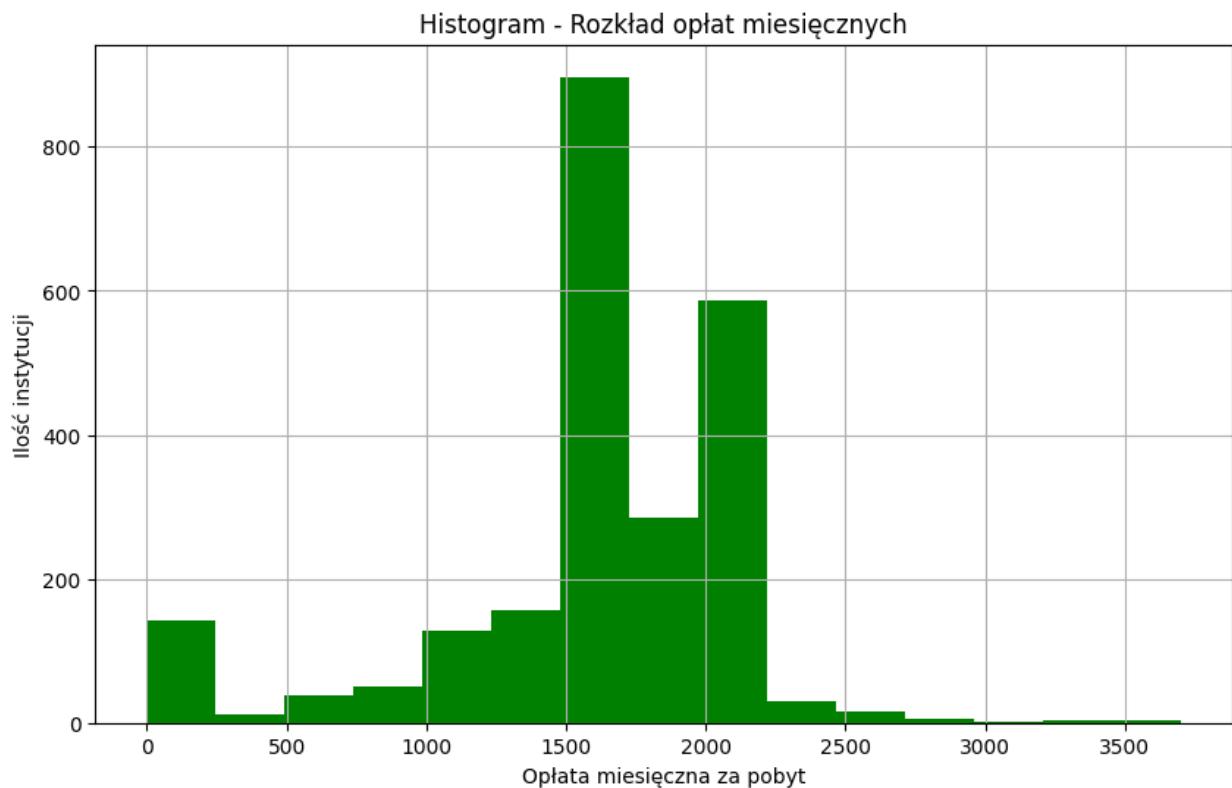
# Ustawienie wykresu
plt.xticks(rotation=45)
plt.grid(True)
plt.tight_layout()
plt.show()
```



```
# 1.2 Wykres słupkowy ze zmianą koloru
plt.figure(figsize=(20, 6))
plt.bar(df['Województwo'], df['Liczba miejsc'], color='skyblue')
plt.title('Wykres Słupkowy - Średnia liczba miejsc w Województwach')
plt.xlabel('Województwo')
plt.ylabel('Liczba miejsc')
plt.xticks(rotation=45)
plt.show()
```



```
# 1.3 Histogram ze zmianą koloru
plt.figure(figsize=(10, 6))
plt.hist(df['Opłata miesięczna za pobyt'], bins=15, color='green')
plt.title('Histogram - Rozkład opłat miesięcznych')
plt.xlabel('Opłata miesięczna za pobyt')
plt.ylabel('Ilość instytucji')
plt.grid(True)
plt.show()
```



```
# 1.4 Wykres kołowy
def categorize_fee(fee):
    if fee <= 999:
        return '0-999 zł'
    elif fee <= 1999:
        return '1000-1999 zł'
    elif fee <= 2999:
        return '2000-2999 zł'
    else:
        return '>3000 zł'

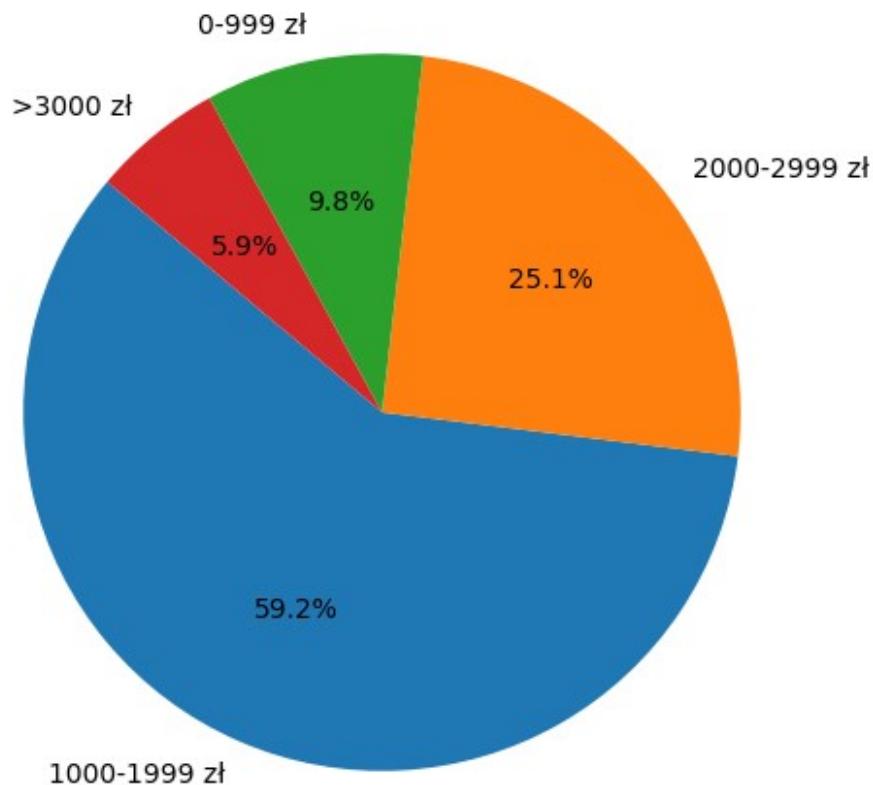
df['Opłata_kategoria'] = df['Opłata miesięczna za pobyt'].apply(lambda x: float(x) if x != '' else 0)
df['Opłata_kategoria'] = df['Opłata_kategoria'].apply(categorize_fee)
category_counts = df['Opłata_kategoria'].value_counts()
```

```

plt.figure(figsize=(10, 6))
plt.pie(category_counts, labels=category_counts.index, autopct='%.1f%%',
        startangle=140)
plt.title('Procentowy udział opłat miesięcznych za pobyt w
przedziałach')
plt.show()

```

Procentowy udział opłat miesięcznych za pobyt w przedziałach

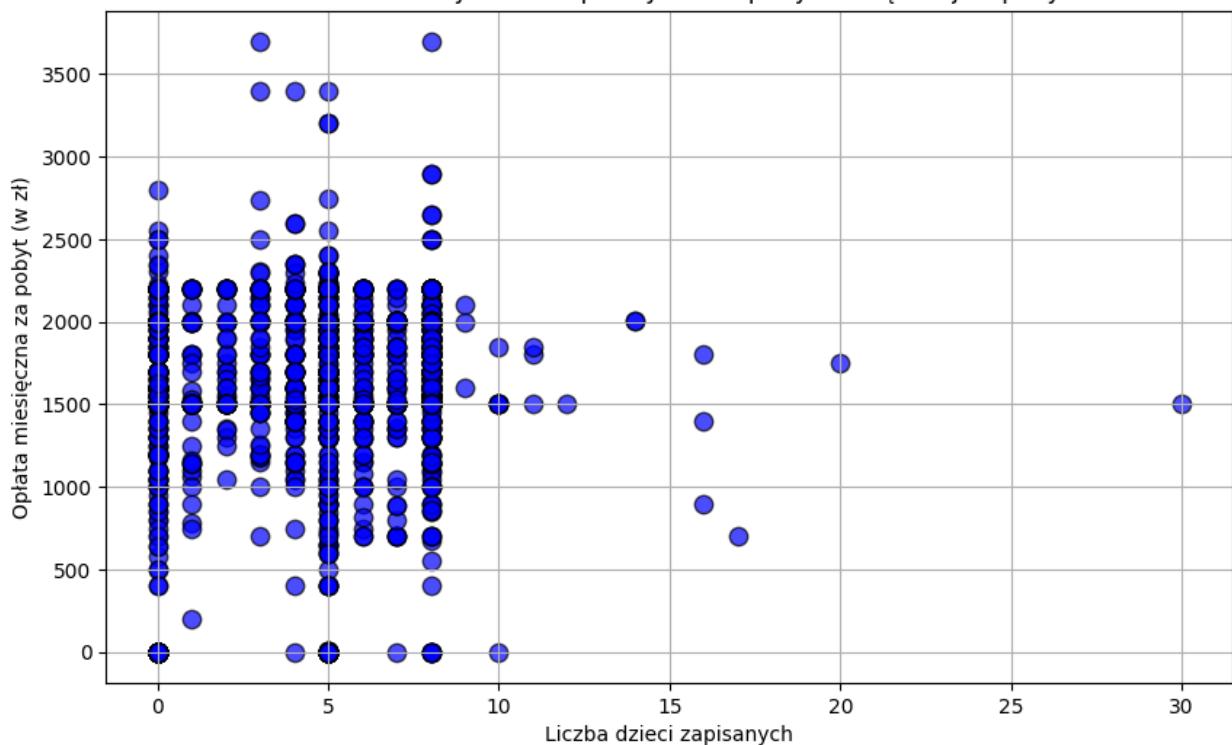


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# 1.5 Wykres punktowy ze zmienionymi markerami i siatką
plt.figure(figsize=(10, 6))
plt.scatter(df['Liczba dzieci zapisanych'], df['Opłata miesięczna za
pobyt'].apply(lambda x: float(x) if x != '' else 0), color='blue',
alpha=0.7, marker='o', edgecolors='black', s=80)
plt.title('Zależność liczby dzieci zapisanych od opłaty miesięcznej za
pobyt')
plt.xlabel('Liczba dzieci zapisanych')
plt.ylabel('Opłata miesięczna za pobyt (w zł)')
plt.grid(True)
plt.show()

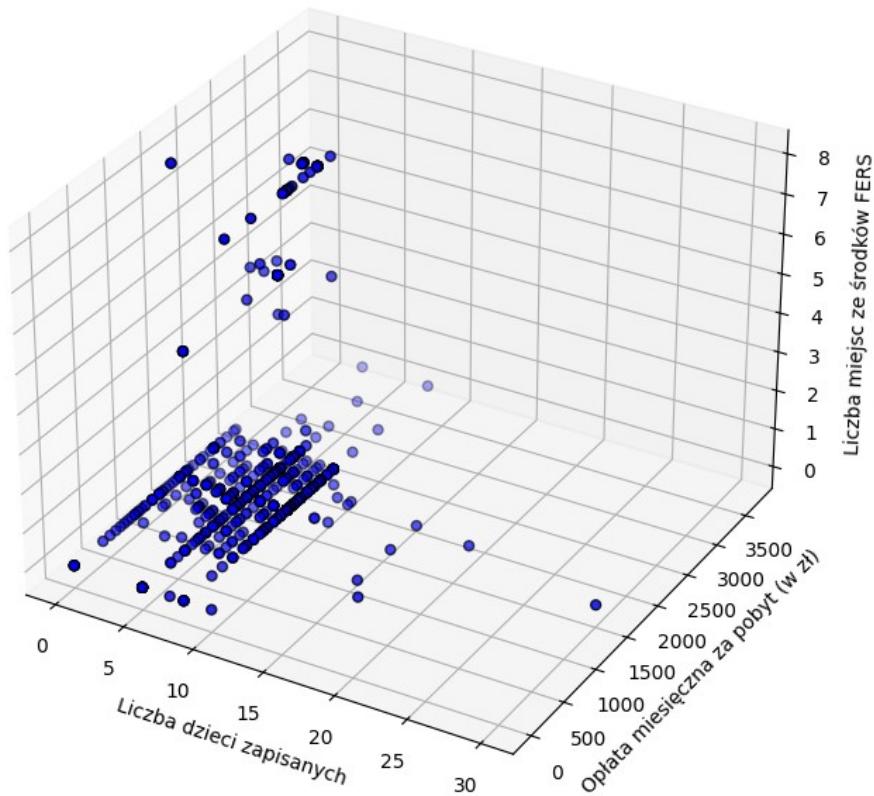
```

Zależność liczby dzieci zapisanych od opłaty miesięcznej za pobyt



```
# 1.6 Wykres 3D:  
fig = plt.figure(figsize=(15, 8))  
ax = fig.add_subplot(111, projection='3d')  
  
x = df['Liczba dzieci zapisanych']  
y = df['Opłata miesięczna za pobyt'].apply(lambda x: float(x) if x !=  
' ' else 0)  
z = df['Liczba miejsc ze środków FERS']  
  
ax.scatter(x, y, z, c='blue', marker='.', edgecolors='black', s=100)  
  
ax.set_title('Zależność liczby dzieci zapisanych od opłaty miesięcznej  
za pobyt i miejsc ze środków FERS (Wykres 3D)')  
ax.set_xlabel('Liczba dzieci zapisanych')  
ax.set_ylabel('Opłata miesięczna za pobyt (w zł)')  
ax.set_zlabel('Liczba miejsc ze środków FERS')  
  
plt.show()
```

Zależność liczby dzieci zapisanych od opłaty miesięcznej za pobyt i miejsc ze środków FERS(Wykres 3D)



```
# 2. Biblioteka Plotly:
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```
# 2.1 Wykres Liniowy (korzystamy z danych z punktu 1.1, dostosowanie motywów)
import plotly.express as px

fig = px.line(avg_oplata_miesieczna, x='Województwo', y='Opłata miesięczna za pobyt',
              title='Średnia opłata miesięczna w zależności od województwa',
              labels={'Opłata miesięczna za pobyt': 'Średnia opłata miesięczna',
                      'Województwo': 'Województwo'},
              line_shape='linear', template='plotly_dark',
              color_discrete_sequence=['blue']) # Kolor linii

fig.update_layout(
    xaxis_title='Województwo',
    yaxis_title='Średnia opłata miesięczna',
)
fig.show()
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# 2.3 Wykres ko\u0144owy
# Podzia\u0144 kolumny "Op\u0142ata miesi\u0144czna za pobyt" na grupy u\u0144ywaj\u0105c
# funkcji categorize_fee z punktu 1.4:
df['Op\u0142ata_grupy'] = df['Op\u0142ata miesi\u0144czna za pobyt'].apply(lambda x:
float(x) if x != '' else 0)
df['Op\u0142ata_grupy'] = df['Op\u0142ata_grupy'].apply(categorize_fee)

group_counts = df['Op\u0142ata_grupy'].value_counts(normalize=True) * 100

fig = px.pie(values=group_counts.values, names=group_counts.index,
title='Procentowy udzia\u0144 op\u0142at miesi\u0144cznych za pobyt w zale\u0144o\u0144ci od grupy',
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fig.update_layout(showlegend=True)
fig.show()

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# 2.5 Wykres punktowy

mdf = df[df['Liczba dzieci zapisanych na miejsca z FERS'] > 0] # Bierz pod uwagę tylko te rekordy, które mają wartość w kolumnie Liczba dzieci (FERS) > 0:
fig = px.scatter(mdf, x='Opłata miesięczna za pobyt', y='Liczba dzieci zapisanych na miejsca z FERS', color='Województwo', size='Liczba miejsc', title='Zależność między opłatą miesięczną a liczbą dzieci zapisanych na miejsca z FERS', labels={'Opłata miesięczna za pobyt': 'Opłata miesięczna za pobyt (zł)', 'Liczba dzieci zapisanych na miejsca z FERS': 'Liczba dzieci (FERS)'})
fig.show()

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# 2.6 Wykres 3D
fig = px.scatter_3d(df, x='Liczba dzieci zapisanych', y='Opłata miesięczna za pobyt', z='Liczba miejsc ze środków FERS',
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fig.show()

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