DSC640

Week3-4 assignment. Author: Xin Tang

Activity: White House Vistor log study and visualization

In [6]:
```
# Important packages needed

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

The original zip file have 3 years data and take a long time to open all of them (sorry I am using an 10 year old computer). so I used the original file and created some new files (based on information from original monthly file) to analysis:

1. summary.xlsx: it includes all months and monthly visitor count (based on TOA count, the records with empty TOA will be consider no visit)
2. 2023-summary.xlsx: it includes all months in 2023 and monthly visitor break down by meeting locations.
3. 2023.12_WAVES.xlsx: this is the month with most visitors records.

In [7]:
```
#read file into different dataframe

df_all = pd.read_excel("summary.xlsx")
df_2023 = pd.read_excel("2023-summary.xlsx")
df_2023Dec = pd.read_excel("2023.12_waves.xlsx", sheet_name='2023.12_WAVES')
```

In [5]:
```
df_all.head()
```

Out[5]:

	Month	TOA Total
0	2021-7	3790
1	2021-8	1408
2	2021-9	1784
3	2021-10	1984
4	2021-11	3232

In [6]:
```
df_2023.head()
```

Out[6]:

	Month	TOA Total	WH	VPR	OEOB	NEOB
0	2023-1	26007	20071	234	5373	329
1	2023-2	33686	26158	540	6575	413
2	2023-3	50103	41146	271	8228	458
3	2023-4	47220	39056	426	7230	508
4	2023-5	61643	52114	563	8539	427

In [7]:
```
df_2023Dec.head()
```

Out[7]:

	Last Name	First Name	Middle Initial	UIN	TOA	POA	TOD	POD	Total People	Terminal Suffix	Meeting Location
0	AABERGSOMOGYI	MARTINA	S	U84967	Dec 4 2023 2:46PM	NaN	NaT	NaN	6	SA	OEOB
1	AAGAARD	ANDREW	L	U91156	Dec 10 2023 8:09PM	NaN	NaT	NaN	50	VW	WH
2	AAL	MICHAEL	J	U80167	Dec 5 2023 11:40AM	NaN	NaT	NaN	4	VW	WH
3	AAL	SABINE	N	U80167	Dec 5 2023 11:40AM	NaN	NaT	NaN	4	VW	WH
4	AALBERS	SYDNEY	P	U82027	Dec 7 2023 11:39AM	NaN	NaT	NaN	4	VW	WH

In [9]:
```
# Now process each dataframe one by one
# First analysis df_all

#c Convert date into datatime format
df_all['Month']= pd.to_datetime(df_all['Month'])
```

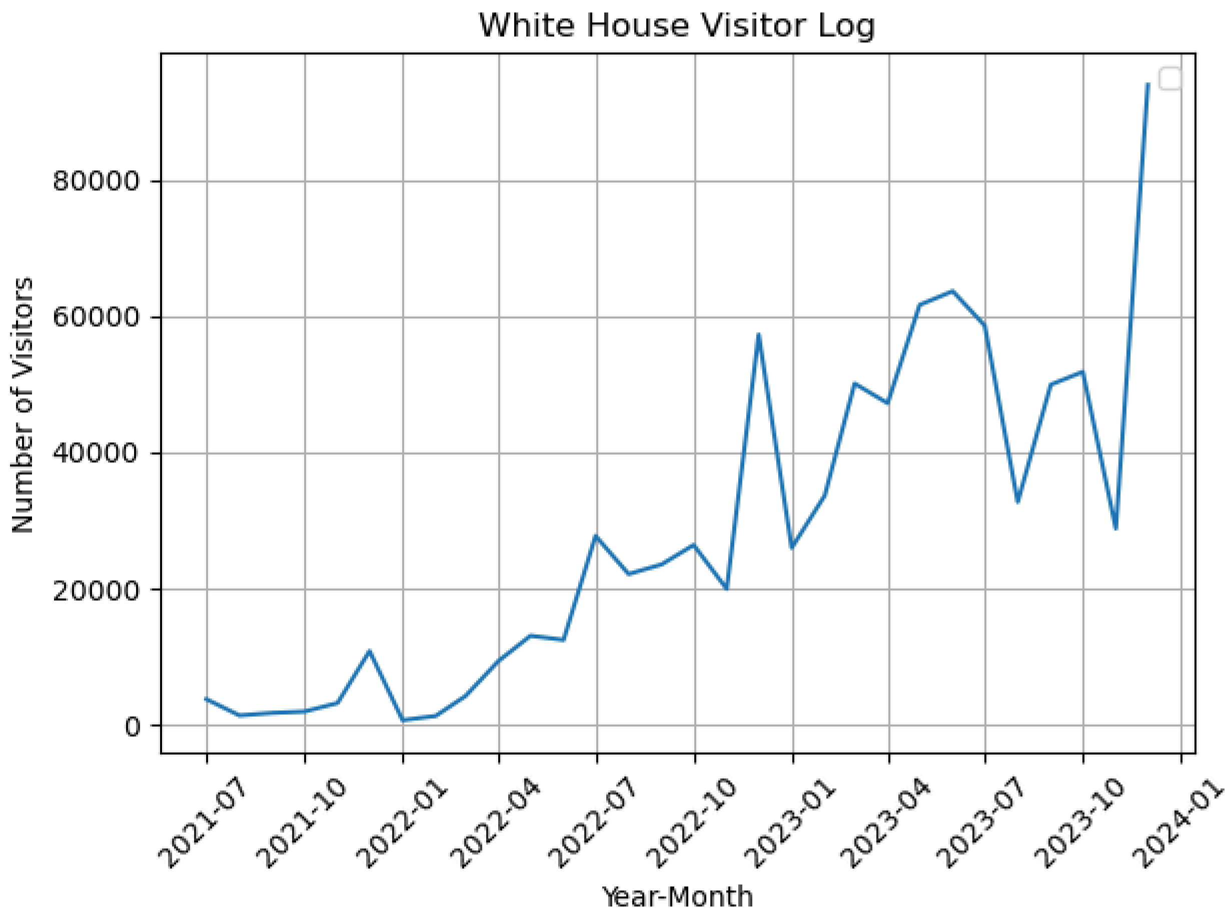
In [10]:
```
df_all.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 30 entries, 0 to 29
Data columns (total 2 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   Month      30 non-null     datetime64[ns]
 1   TOA Total  30 non-null     int64
dtypes: datetime64[ns](1), int64(1)
memory usage: 612.0 bytes
```

In [21]:

```
# Create line chart to show visitor trend
print('visit volume increased rapidly in Post Covid era')
plt.plot(df_all['Month'], df_all['TOA Total']) # Plot the chart
plt.title('White House Visitor Log')
plt.xlabel('Year-Month')
plt.ylabel('Number of Visitors')
plt.xticks(rotation=45)
plt.legend()
plt.grid()
plt.tight_layout()
plt.figure(figsize=(18, 4))
plt.show()
```

```
No artists with labels found to put in legend.  Note that artists whose label start with an underscore are ignored when
legend() is called with no argument.
visit volume increased rapidly in Post Covid era
```



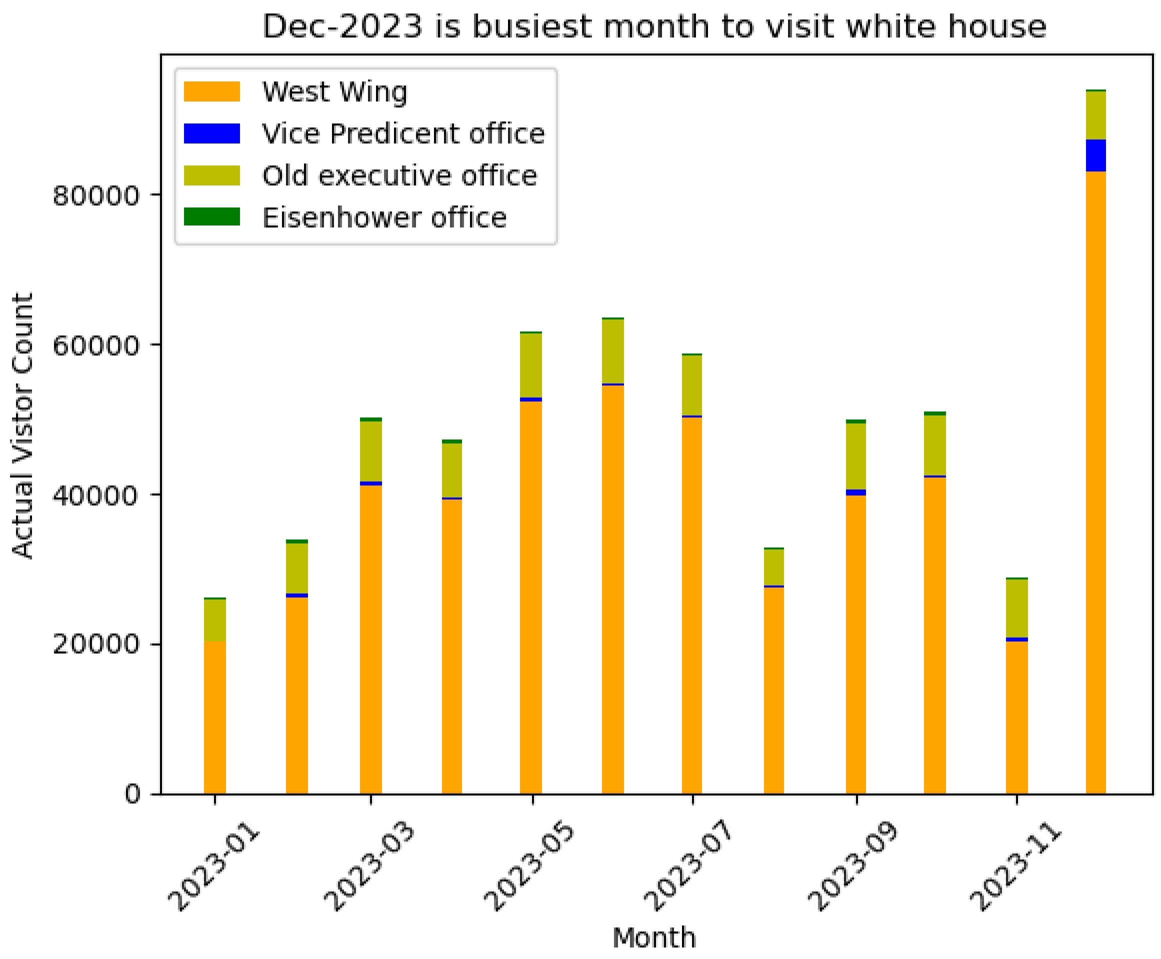
```
<Figure size 1800x400 with 0 Axes>
```

In [3]:
```
# use 2023 file to get more information

# first convert month to datatime format
df_2023['Month']= pd.to_datetime(df_2023['Month'])
```

In [50]:
```
# create a stacked column chart with time
x = df_2023['Month']
y1 = df_2023['WH']
y2 = df_2023['VPR']
y3 = df_2023['OEOB']
y4 = df_2023['NEOB']

# plot bars in stack manner
print("west wing is always the most popular building to visit")
```

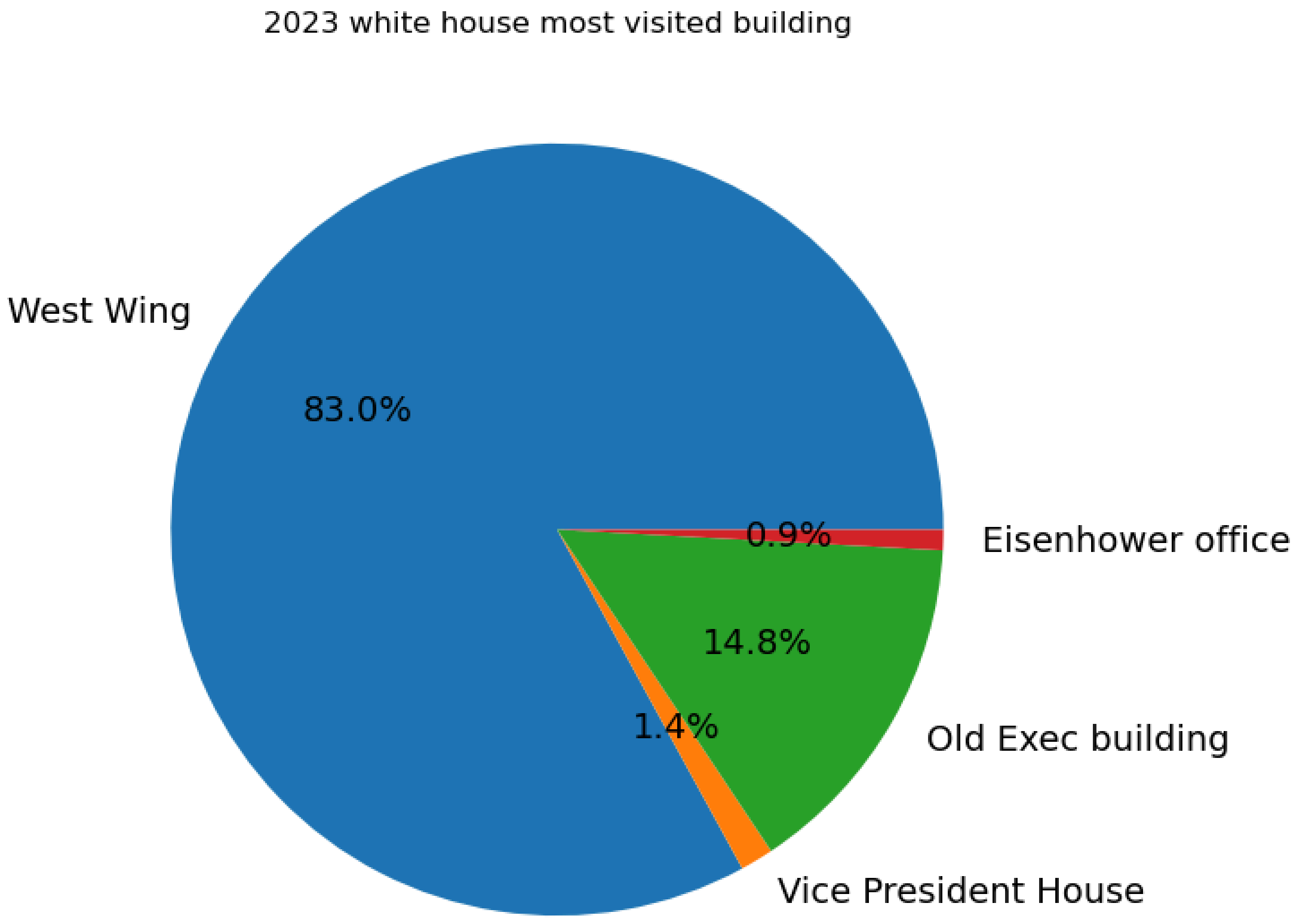
```
plt.bar(x, y1, width =8, color='orange')
plt.bar(x, y2, width =8, bottom=y1, color='b')
plt.bar(x, y3, width =8, bottom=y1+y2, color='y')
plt.bar(x, y4, width =8, bottom=y1+y2+y3, color='g')
plt.xlabel("Month")
plt.xticks(rotation=45)
plt.ylabel("Actual Vistor Count")
plt.legend(["West Wing", "Vice Predicent office", "Old executive office", "Eisenhower office"])
plt.title("Dec-2023 is busiest month to visit white house")

plt.show()
```

```
west wing is always the most popular building to visit
```



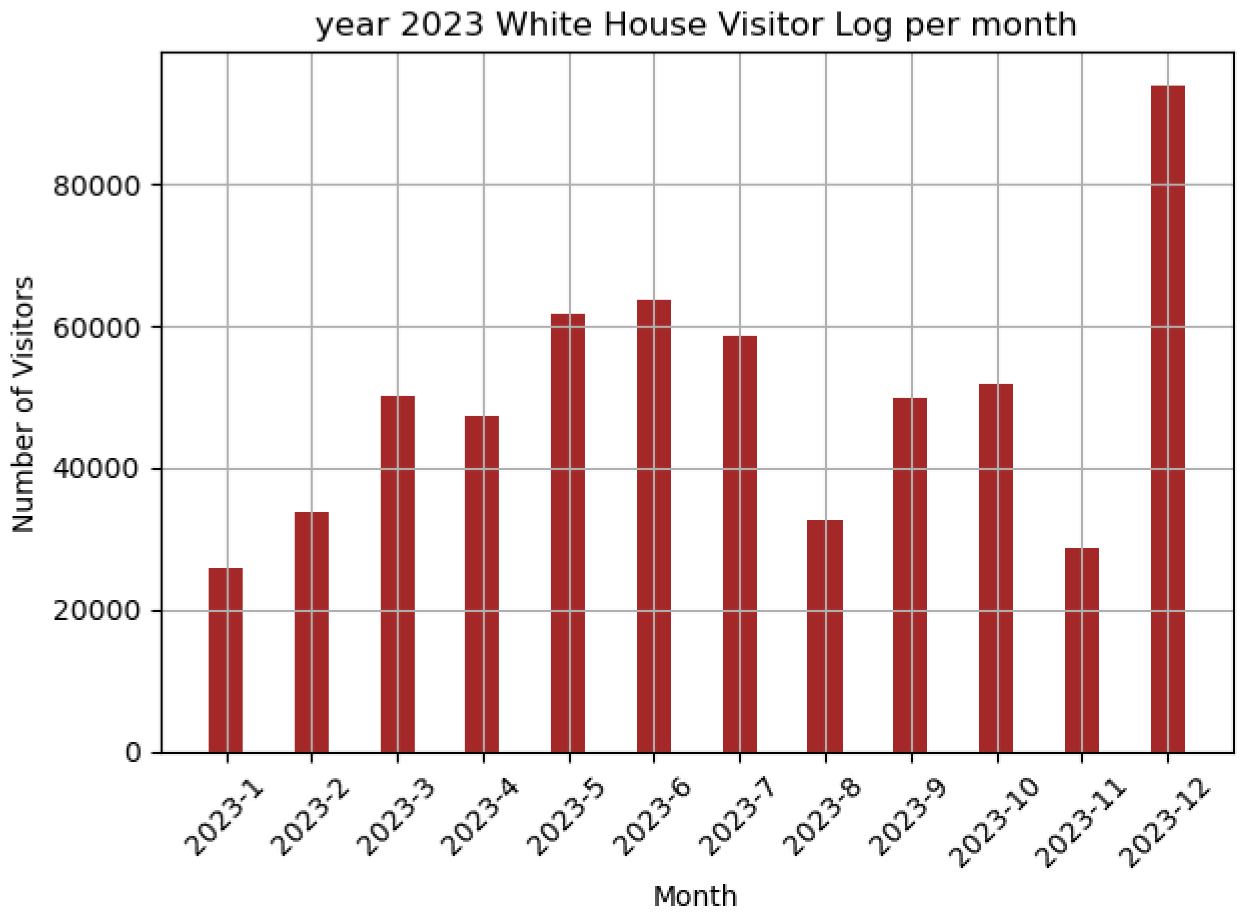
In [8]:
```
# now visualize the visit per building
total_WH = df_2023['WH'].sum()
total_VPR = df_2023['VPR'].sum()
total_OEOB = df_2023['OEOB'].sum()
total_NEOB = df_2023['NEOB'].sum()
```

In [9]:
```
# create pie chart
buildings = ['West Wing', 'Vice President House', 'Old Exec building','Eisenhower office']
Count = [total_WH, total_VPR, total_OEOB, total_NEOB]

fig = plt.figure(figsize=(10, 7))
plt.pie(Count, labels=buildings, autopct='%0.1f%%', textprops={'fontsize': 14})
plt.title('2023 white house most visited building')

plt.show()
```



In [19]:
```
# now use column chart to visualize the 2023 visitor volume change month by month

plt.bar(df_2023['Month'], df_2023['TOA Total'], color ='brown', width = 0.4)
plt.title('year 2023 White House Visitor Log per month')
plt.xlabel('Month')
plt.ylabel('Number of Visitors')
plt.xticks(rotation=45)
#plt.legend()
```

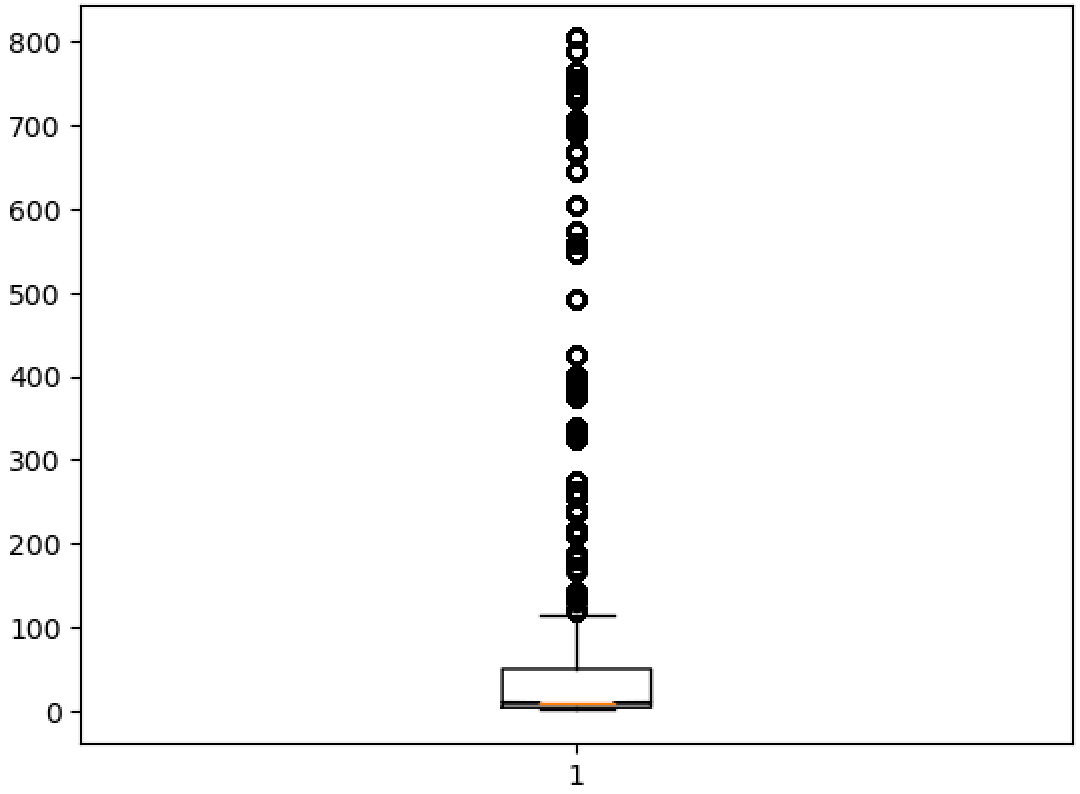
```
plt.grid()
plt.tight_layout()
plt.show()
```



In [8]:

```
# now look at the tour group size distribution using boxplot

import statistics
plt.boxplot(df_2023Dec['Total People'], notch=True)
print('most common white house tour group size in year 2023 is', df_2023Dec['Total People'].median())
```

```
most common white house tour group size in year 2023 is 10.0
```



In [30]:
```
#now check 2023 Daily visitor count using step chart
df_2023Decdaily = pd.read_excel("2023.12_waves.xlsx", sheet_name='Daily')
df_2023Decdaily.tail(10)
```

Out[30]:

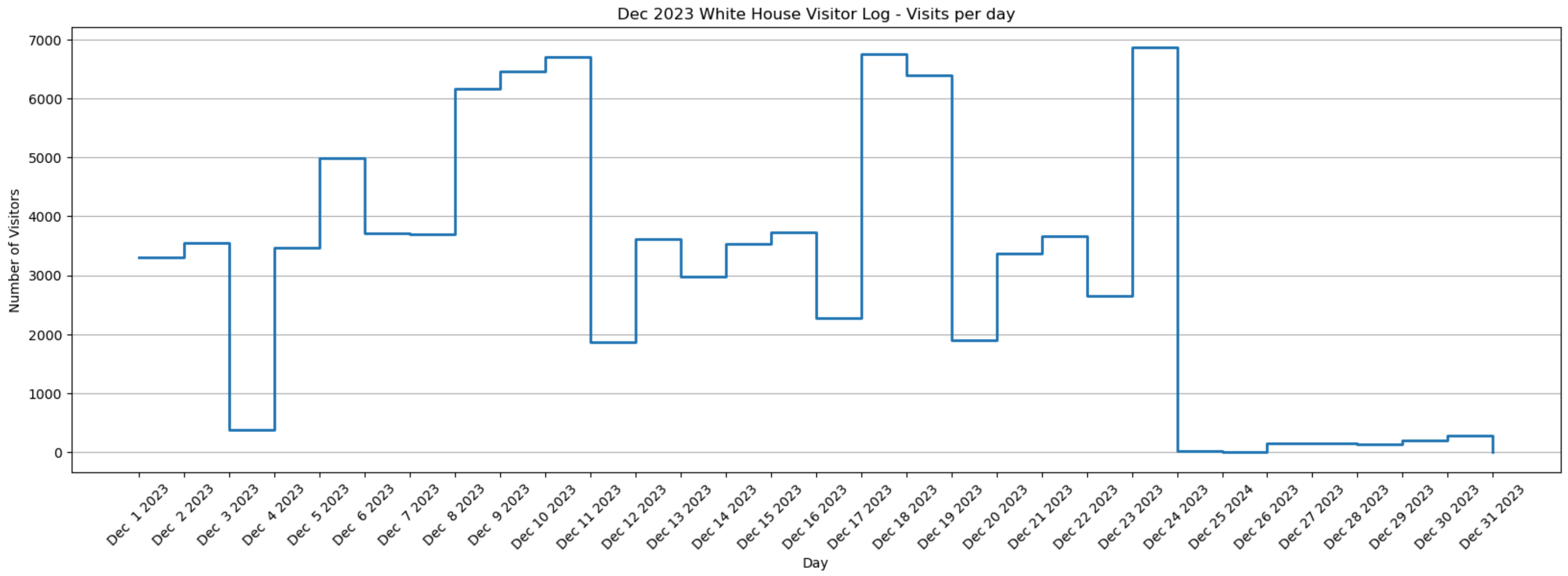
	Date	TOA daily total
21	Dec 22 2023	2649
22	Dec 23 2023	6867
23	Dec 24 2023	14
24	Dec 25 2024	4
25	Dec 26 2023	144
26	Dec 27 2023	154
27	Dec 28 2023	128
28	Dec 29 2023	190
29	Dec 30 2023	284
30	Dec 31 2023	1

In [27]:

```
# convert date to timedate format
df_2023Decdaily['Date']= pd.to_datetime(df_2023Decdaily['Date'])
```

In [31]:

```
# Plotting the step chart
plt.figure(figsize=(20, 6))
plt.step(df_2023Decdaily['Date'], df_2023Decdaily['TOA daily total'], where='post', label='Visitors Count', linewidth=2
plt.title('Dec 2023 White House Visitor Log - Visits per day')
plt.xlabel('Day')
plt.ylabel('Number of Visitors')
plt.xticks(rotation=45)
plt.grid(axis='y')
plt.show()
```



```
In [32]: # End of python code
```

```
In [ ]:
```