

In [1]: `pip install pandas`

```
Requirement already satisfied: pandas in c:\users\samil\anaconda3\lib\site-packages (2.0.3)Note: you may need to restart the kernel to use updated packages.
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\samil\anaconda3\lib\site-packages (from pandas) (2.8.2)
Requirement already satisfied: tzdata>=2022.1 in c:\users\samil\anaconda3\lib\site-packages (from pandas) (2023.3)
Requirement already satisfied: numpy>=1.20.3; python_version < "3.10" in c:\users\samil\anaconda3\lib\site-packages (from pandas) (1.24.4)
Requirement already satisfied: pytz>=2020.1 in c:\users\samil\anaconda3\lib\site-packages (from pandas) (2020.1)
Requirement already satisfied: six>=1.5 in c:\users\samil\anaconda3\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.15.0)
```

In [2]: `pip install plotly`

```
Requirement already satisfied: plotly in c:\users\samil\anaconda3\lib\site-packages (5.18.0)
Requirement already satisfied: packaging in c:\users\samil\anaconda3\lib\site-packages (from plotly) (20.4)
Requirement already satisfied: tenacity>=6.2.0 in c:\users\samil\anaconda3\lib\site-packages (from plotly) (8.2.3)
Requirement already satisfied: pyparsing>=2.0.2 in c:\users\samil\anaconda3\lib\site-packages (from packaging->plotly) (2.4.7)
Requirement already satisfied: six in c:\users\samil\anaconda3\lib\site-packages (from packaging->plotly) (1.15.0)
Note: you may need to restart the kernel to use updated packages.
```

In [3]: `pip install matplotlib`

```
Requirement already satisfied: matplotlib in c:\users\samil\anaconda3\lib\site-packages (3.7.4)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (1.2.0)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (4.47.2)
Requirement already satisfied: cycler>=0.10 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (0.10.0)
Requirement already satisfied: importlib-resources>=3.2.0; python_version < "3.10" in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (6.1.1)
Requirement already satisfied: packaging>=20.0 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (20.4)
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (2.4.7)
Requirement already satisfied: numpy<2,>=1.20 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (1.24.4)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (1.1.1)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (2.8.2)
Requirement already satisfied: pillow>=6.2.0 in c:\users\samil\anaconda3\lib\site-packages (from matplotlib) (7.2.0)
Requirement already satisfied: six in c:\users\samil\anaconda3\lib\site-packages (from cycler>=0.10->matplotlib) (1.15.0)
Requirement already satisfied: zipp>=3.1.0; python_version < "3.10" in c:\users\samil\anaconda3\lib\site-packages (from importlib-resources>=3.2.0; python_version < "3.10"->matplotlib) (3.1.0)
Note: you may need to restart the kernel to use updated packages.
```

```
In [4]: import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
from matplotlib.animation import FuncAnimation
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

C:\Users\Samil\anaconda3\lib\site-packages\pandas\core\computation\expressions.py:20: UserWarning: Pandas requires version '2.7.3' or newer of 'numexpr' (version '2.7.1' currently installed).
from pandas.core.computation.check import NUMEXPR_INSTALLED

```
In [5]: raw_dataset=pd.read_csv("Doublet_EAF_35F2.csv",sep=",")
```

```
In [6]: Doublet_EAF_35F2= raw_dataset.copy()
Doublet_EAF_35F2.head()
```

Out[6]:

	Date	Longitude	Latitude	Depth	Magnitude
0	05/02/2023 04:16:52	36.044	37.411	7.08	2.0
1	04/02/2023 08:22:17	36.356	37.390	7.00	2.7
2	03/02/2023 22:43:10	38.814	38.274	6.57	2.5
3	03/02/2023 22:06:30	36.360	37.230	7.02	2.1
4	03/02/2023 11:37:12	36.395	37.201	7.01	2.2

```
In [7]: Doublet_EAF_35F2.shape
```

Out[7]: (4287, 5)

```
In [8]: x = Doublet_EAF_35F2.iloc[:,1].values
y = Doublet_EAF_35F2.iloc[:,2].values
z = Doublet_EAF_35F2.iloc[:,3].values
colors = Doublet_EAF_35F2.iloc[:,4].values
sizes = Doublet_EAF_35F2.iloc[:,4].values*15
```



```
In [9]: import plotly.graph_objects as go

# Obtain high-resolution world map data online
fig = go.Figure(go.Choroplethmapbox(
    geojson="https://raw.githubusercontent.com/johan/world.geo.json/master/countries.geo.json",
    locations=["USA", "CAN", "MEX", "RUS", "CHN"], # Example country codes (USA, Canada, Mexico, Russia, China)
    z=[1, 1, 1, 1, 1], # Values to be assigned to countries (all set to 1)
    colorscale='Jet', # Color scale name (Viridis, YlGnBu, Jet, etc.)
    zmin=2,
    zmax=7,
    marker_opacity=0.9, # Opacity of country borders
    marker_line_width=1, # Thickness of country borders
))

# Create sample earthquake data
earthquake_data = {
    'Longitude': x,
    'Latitude': y,
    'Magnitude': colors,
}

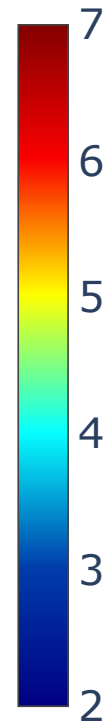
# Add earthquake data with Scatter plot
fig.add_trace(go.Scattermapbox(
    lat=earthquake_data['Latitude'],
    lon=earthquake_data['Longitude'],
    mode='markers',
    marker=dict(
        size=earthquake_data['Magnitude'] * 3, # Set point sizes based on Magnitude value
        color=earthquake_data['Magnitude'], # Set color scale based on Magnitude value
        colorscale='Jet', # Color scale name (Viridis, YlGnBu, Jet, etc.)
    ),
))

# Specify map layout and style
fig.update_layout(
    mapbox_style="open-street-map", # Set map style (for other styles: "open-street-map", "stamen-terrain", etc.)
    mapbox_zoom=6, # Set map zoom level
    mapbox_center={"lat": 37.000, "lon": 37.0000}, # Set map center (center of the USA)
)

# Increase resolution and font size
fig.update_layout(
    width=700, # Set width to increase resolution
    height=610, # Set height to increase resolution
    font=dict(
        size=25 # Set font size for English comments
    )
)

# Display the plot
```

```
fig.show()
```



```
In [10]: import numpy as np
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
import ipywidgets as widgets
from ipywidgets import interactive
from IPython.display import display

# İnteraktif işlev

def plot_3d_scatter(elev, azim, zoom, theta):
    fig = plt.figure(figsize=(12, 10))
    ax = fig.add_subplot(111, projection='3d')

    ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet')
    cbar = plt.colorbar(ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet'))
    cbar.set_label('Magnitude')

    ax.view_init(elev=elev, azim=azim)
    ax.set_xlabel('Longitude')
    ax.set_ylabel('Latitude')
    ax.set_zlabel('Depth_km')
    ax.dist = zoom # Zoom ayarı
    ax.azim = theta # Maus ile çevirme
    plt.show()

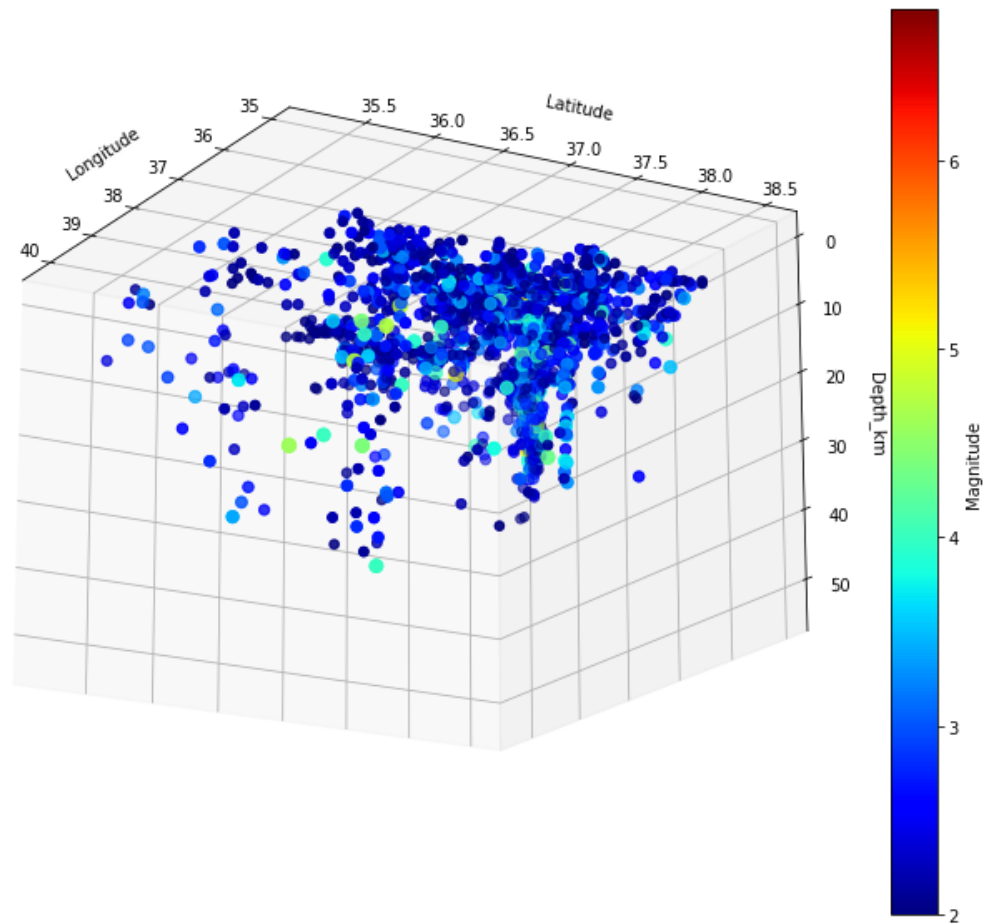
# İnteraktif widget'ı oluşturma
elev_slider = widgets.IntSlider(min=0, max=180, value=30, description='Elevation:')
azim_slider = widgets.IntSlider(min=0, max=360, value=30, description='Azimuth:')
zoom_slider = widgets.FloatSlider(min=1, max=10, value=5, description='Zoom:')
theta_slider = widgets.IntSlider(min=0, max=360, value=30, description='Theta:')
interactive_plot = interactive(plot_3d_scatter, elev=elev_slider, azim=azim_slider, zoom=zoom_slider, theta=theta_slider)

# Widget'ı görüntüleme
display(interactive_plot)
```

Elevation: ☐ 163Azimuth: ☐ 30Zoom: ☐ 10.00Theta: ☐ 30

<ipython-input-10-fbd5a5764876>:24: MatplotlibDeprecationWarning:

The dist attribute was deprecated in Matplotlib 3.6 and will be removed two minor releases later.



```
In [23]: x = Doublet_EAF_35F2.iloc[:,1].values
y = Doublet_EAF_35F2.iloc[:,2].values
z = Doublet_EAF_35F2.iloc[:,0].values
colors = Doublet_EAF_35F2.iloc[:,4].values
sizes = Doublet_EAF_35F2.iloc[:,4].values*8
```

```
In [24]: from datetime import datetime

# Zaman damgalarını içeren bir liste oluştur
timestamps = z

# Zaman damgalarını saniyeye dönüştür
seconds = [datetime.timestamp(datetime.strptime(timestamp, '%d/%m/%Y %H:%M:%S')) for timestamp in timestamps]

print(seconds) # Saniye cinsinden zaman damgalarını görüntüle
```

```
[1675559812.0, 1675488137.0, 1675453390.0, 1675451190.0, 1675413432.0, 1675411508.0, 1675224124.0, 1675124698.0, 1675045005.0, 1674997959.0, 1674950526.0, 1674711887.0, 1674679136.0, 1674623185.0, 1674615971.0, 1674613283.0, 1674597456.0, 1674585644.0, 1674343719.0, 1674323232.0, 1674287507.0, 1674257214.0, 1674245039.0, 1674158668.0, 1674037847.0, 1673968960.0, 1673917950.0, 1673819193.0, 1673751565.0, 1673746357.0, 1673746144.0, 1673744847.0, 1673743177.0, 1673742986.0, 1673640164.0, 1673631848.0, 1673628484.0, 1673623784.0, 1673583362.0, 1673545249.0, 1673430093.0, 1673267139.0, 1673260074.0, 1673254420.0, 1673233062.0, 1673215917.0, 1673121507.0, 1673113662.0, 1672957263.0, 1672915715.0, 1672893788.0, 1672893663.0, 1672827652.0, 1672815105.0, 1672675199.0, 1672645083.0, 1672623482.0, 1672613504.0, 1672597516.0, 1672588112.0, 1672463702.0, 1672275615.0, 1672242983.0, 1672204880.0, 1672201862.0, 1672160100.0, 1672157184.0, 1672154106.0, 1672153773.0, 1672115492.0, 1672064096.0, 1672038531.0, 1672031005.0, 1671886384.0, 1671837831.0, 1671822899.0, 1671808623.0, 1671806930.0, 1671805411.0, 1671805381.0, 1671745331.0, 1671745211.0, 1671736740.0, 1671736723.0, 1671734278.0, 1671733567.0, 1671726547.0, 1671726296.0, 1671723191.0, 1671696391.0, 1671655718.0, 1671651725.0, 1671637874.0, 1671537848.0, 1671376389.0, 1671341052.0, 1671341015.0, 1671173979.0, 1671169615.0, 1671040398.0, 1671006260.0, 1670900943.0, 1670887868.0, 1670885530.0, 1670821960.0, 1670737325.0, 1670725362.0, 1670651087.0, 1670614303.0, 1670581179.0, 1670306001.0, 1670266088.0, 1670080082.0, 1670042257.0, 1670010792.0, 1669869831.0, 1669752385.0, 1669665987.0, 1669665871.0, 1669631812.0, 1669297491.0, 1669212826.0, 1669202370.0, 1669163671.0, 1669129764.0, 1669056893.0, 1669009451.0, 1668839073.0, 1668769873.0, 1668639192.0, 1668620419.0, 1668620408.0, 1668440521.0, 1668258809.0, 1668158745.0, 1668105532.0, 1667940265.0, 1667899173.0, 1667869993.0, 1667792889.0, 1667713076.0, 1667679600.0, 1667672742.0, 1667638348.0, 1667627775.0, 1667604988.0, 1667563573.0, 1667384590.0, 1667381019.0, 1667376987.0, 1667357575.0, 1667230465.0, 1667212381.0, 1667139725.0, 1667075551.0, 1667019891.0, 1667010576.0, 1667006020.0, 1666984405.0, 1666973770.0, 1666955631.0, 1666920365.0, 1666850372.0, 1666821771.0, 1666632808.0, 1666625980.0, 1666622118.0, 1666522738.0, 1666512775.0, 1666502909.0, 1666365201.0, 1666327777.0, 1666301069.0, 1666292346.0, 1666286682.0, 1666286405.0, 1666285078.0, 1666283831.0, 1666277519.0, 1666277435.0, 1666276387.0, 1666275242.0, 1666274154.0, 1666271067.0, 1666270312.0, 1666262533.0, 1666261068.0, 1666259470.0, 1666259161.0, 1666257541.0, 1666257192.0, 1666256733.0, 1666256042.0, 1666254899.0, 1666233620.0, 1666233320.0, 1666233020.0, 1666232720.0, 1666232420.0, 1666232120.0, 1666231820.0, 1666231520.0, 1666231220.0, 1666230920.0, 1666230620.0, 1666230320.0, 1666230020.0, 1666229720.0, 1666229420.0, 1666229120.0, 1666228820.0, 1666228520.0, 1666228220.0, 1666227920.0, 1666227620.0, 1666227320.0, 1666227020.0, 1666226720.0, 1666226420.0, 1666226120.0, 1666225820.0, 1666225520.0, 1666225220.0, 1666224920.0, 1666224620.0, 1666224320.0, 1666224020.0, 1666223720.0, 1666223420.0, 1666223120.0, 1666222820.0, 1666222520.0, 1666222220.0, 1666221920.0, 1666221620.0, 1666221320.0, 1666221020.0, 1666220720.0, 1666220420.0, 1666220120.0, 1666219820.0, 1666219520.0, 1666219220.0, 1666218920.0, 1666218620.0, 1666218320.0, 1666218020.0, 1666217720.0, 1666217420.0, 1666217120.0, 1666216820.0, 1666216520.0, 1666216220.0, 1666215920.0, 1666215620.0, 1666215320.0, 1666215020.0, 1666214720.0, 1666214420.0, 1666214120.0, 1666213820.0, 1666213520.0, 1666213220.0, 1666212920.0, 1666212620.0, 1666212320.0, 1666212020.0, 1666211720.0, 1666211420.0, 1666211120.0, 1666210820.0, 1666210520.0, 1666210220.0, 1666209920.0, 1666209620.0, 1666209320.0, 1666209020.0, 1666208720.0, 1666208420.0, 1666208120.0, 1666207820.0, 1666207520.0, 1666207220.0, 1666206920.0, 1666206620.0, 1666206320.0, 1666206020.0, 1666205720.0, 1666205420.0, 1666205120.0, 1666204820.0, 1666204520.0, 1666204220.0, 1666203920.0, 1666203620.0, 1666203320.0, 1666203020.0, 1666202720.0, 1666202420.0, 1666202120.0, 1666201820.0, 1666201520.0, 1666201220.0, 1666200920.0, 1666200620.0, 1666200320.0, 1666200020.0, 1666199720.0, 1666199420.0, 1666199120.0, 1666198820.0, 1666198520.0, 1666198220.0, 1666197920.0, 1666197620.0, 1666197320.0, 1666197020.0, 1666196720.0, 1666196420.0, 1666196120.0, 1666195820.0, 1666195520.0, 1666195220.0, 1666194920.0, 1666194620.0, 1666194320.0, 1666194020.0, 1666193720.0, 1666193420.0, 1666193120.0, 1666192820.0, 1666192520.0, 1666192220.0, 1666191920.0, 1666191620.0, 1666191320.0, 1666191020.0, 1666190720.0, 1666190420.0, 1666190120.0, 1666189820.0, 1666189520.0, 1666189220.0, 1666188920.0, 1666188620.0, 1666188320.0, 1666188020.0, 1666187720.0, 1666187420.0, 1666187120.0, 1666186820.0, 1666186520.0, 1666186220.0, 1666185920.0, 1666185620.0, 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```


In [25]: seconds

Out[25]: [1675559812.0,
1675488137.0,
1675453390.0,
1675451190.0,
1675413432.0,
1675411508.0,
1675224124.0,
1675124698.0,
1675045005.0,
1674997959.0,
1674950526.0,
1674711887.0,
1674679136.0,
1674623185.0,
1674615971.0,
1674613283.0,
1674597456.0,
1674585644.0,
1674343719.0,
1674333333.0]

```
In [26]: import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
import numpy as np
from datetime import datetime

# Assuming Doublet_EAF_35F2 is a DataFrame with appropriate columns
x = Doublet_EAF_35F2.iloc[:, 1].values
y = Doublet_EAF_35F2.iloc[:, 2].values
z = seconds
colors = Doublet_EAF_35F2.iloc[:, 4].values
sizes = Doublet_EAF_35F2.iloc[:, 4].values * 15

fig = plt.figure(figsize=(12, 8))
ax = fig.add_subplot(111, projection='3d')

# Scatter plot
scatter = ax.scatter(x, y, z, c=colors, s=sizes, cmap='jet')

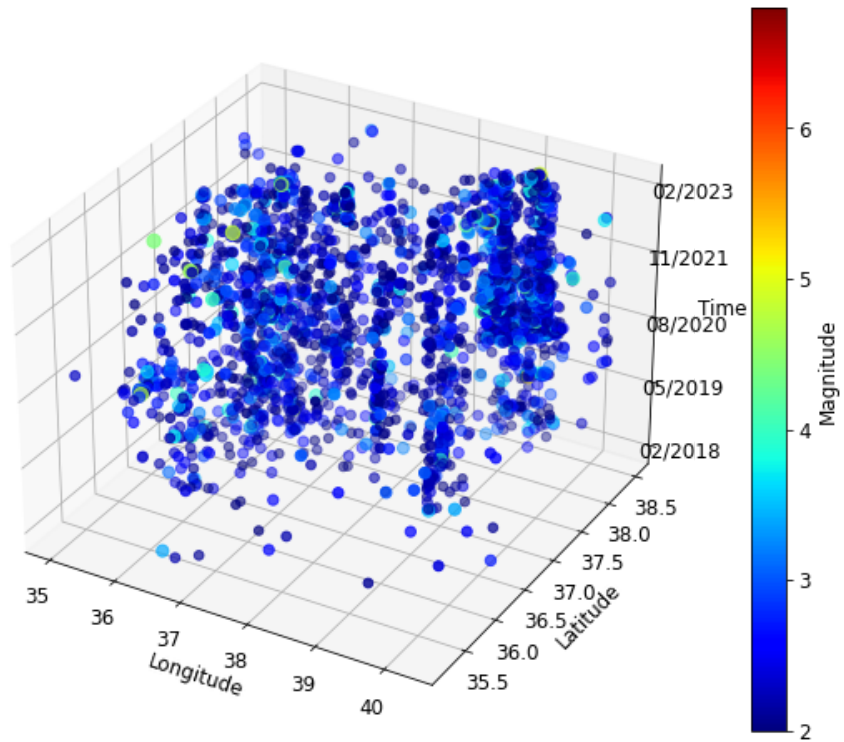
# Colorbar
cbar = plt.colorbar(scatter)
cbar.set_label('Magnitude')

# Labeling axes
ax.set_xlabel('Longitude')
ax.set_ylabel('Latitude')
ax.set_zlabel('Time')

# Formatting time ticks
# Assuming seconds is a List or array of time values
# Adjust the ticks and labels according to your data
time_ticks = np.linspace(min(seconds), max(seconds), 5)
time_labels = [datetime.fromtimestamp(t).strftime('%m/%Y') for t in time_ticks]
ax.set_zticks(time_ticks)
ax.set_zticklabels(time_labels)

# Adjust font size
plt.rc('font', size=12)

plt.show()
```



In []:

In []: