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import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from PIL import Image, ImageDraw


data_path = 'data.csv'

data = pd.read_csv(data_path, names=['LATITUDE', 'LONGITUDE'], sep=',')

gps_data = tuple(zip(data['LATITUDE'].values, data['LONGITUDE'].values))


image = Image.open('map.png', 'r') # Load map image.

img_points = []

for d in gps_data:

    x1, y1 = scale_to_img(d, (image.size[0], image.size[1])) # Convert GPS coordinates to image
    coordinates.

    img_points.append((x1, y1))

draw = ImageDraw.Draw(image)

draw.line(img_points, fill=(255, 0, 0), width=2) # Draw converted records to the map image.


image.save('resultMap.png')

x_ticks = map(lambda x: round(x, 4), np.linspace(lon1, lon2, num=7))

y_ticks = map(lambda x: round(x, 4), np.linspace(lat1, lat2, num=8))

y_ticks = sorted(y_ticks, reverse=True) # y ticks must be reversed due to conversion to image
coordinates.


fig, axis1 = plt.subplots(figsize=(10, 10))

axis1.imshow(plt.imread('resultMap.png')) # Load the image to matplotlib plot.

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axis1.set_xlabel('Longitude')  
axis1.set_ylabel('Latitude')  
axis1.set_xticklabels(x_ticks)  
axis1.set_yticklabels(y_ticks)  
axis1.grid()  
plt.show()
```