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1RN21CD060

Data Visualization(A-2)

```

# Import necessary libraries
import numpy as np
import matplotlib.pyplot as plt
from sklearn.neighbors import KernelDensity

# Generate synthetic data
np.random.seed(42)
# Create a bimodal distribution
data = np.concatenate([
    np.random.normal(loc=-3, scale=1, size=500),
    np.random.normal(loc=3, scale=1, size=500)
])

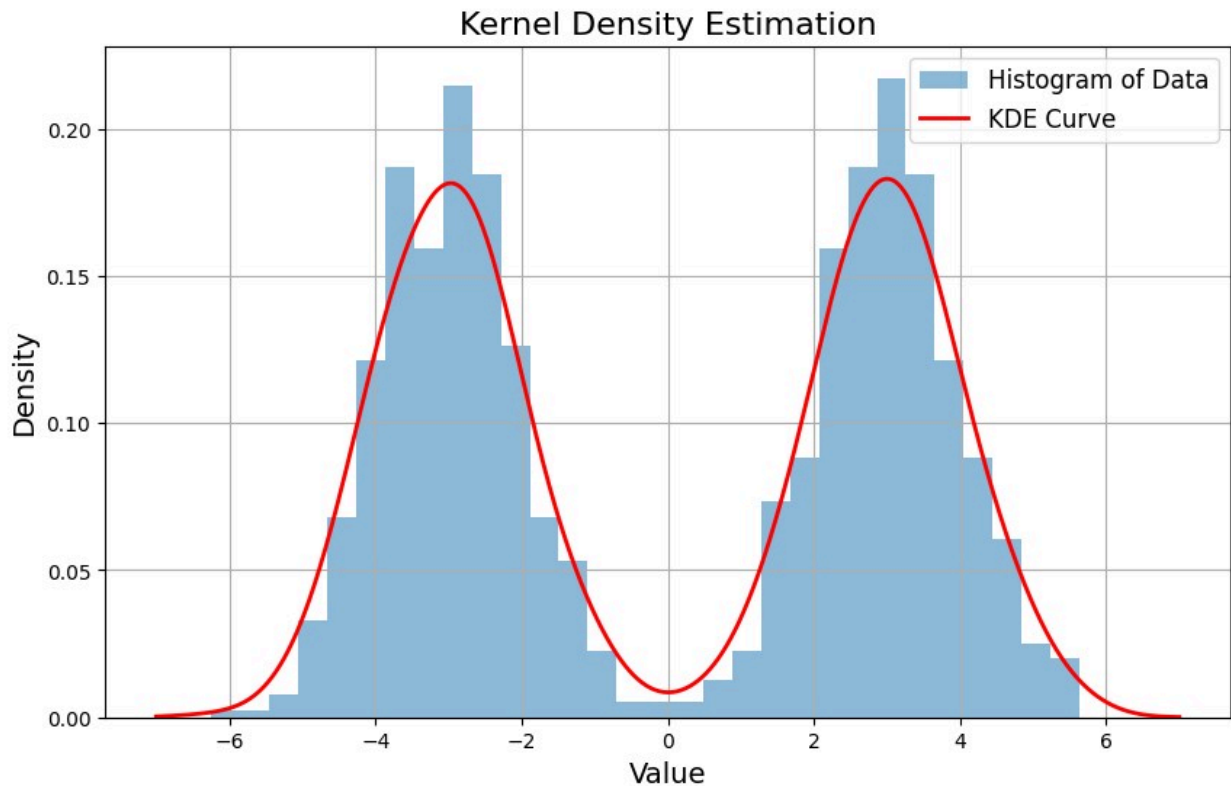
# Reshape data for KDE (requires 2D array)
data = data[:, np.newaxis]

# Fit Kernel Density Estimation model
kde = KernelDensity(kernel='gaussian', bandwidth=0.5).fit(data)

# Evaluate KDE on a range of values
x_plot = np.linspace(-7, 7, 1000)[:, np.newaxis]
log_density = kde.score_samples(x_plot)
density = np.exp(log_density)

# Plot the results
plt.figure(figsize=(10, 6))
plt.hist(data, bins=30, density=True, alpha=0.5, label='Histogram of Data')
plt.plot(x_plot[:, 0], density, label='KDE Curve', color='red',
         linewidth=2)
plt.title('Kernel Density Estimation', fontsize=16)
plt.xlabel('Value', fontsize=14)
plt.ylabel('Density', fontsize=14)
plt.legend(fontsize=12)
plt.grid()
plt.show()

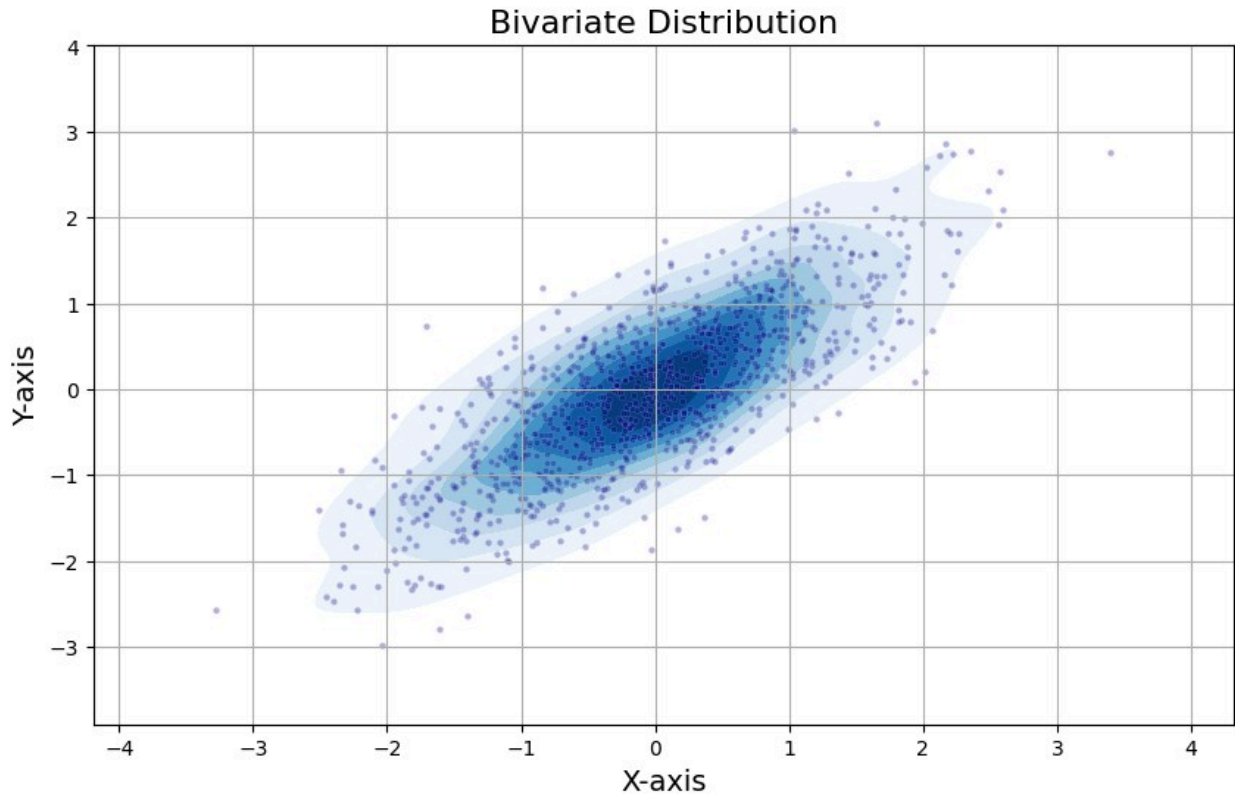
```



```
# Import necessary libraries
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

# Generate synthetic bivariate data
np.random.seed(42)
# Create a bivariate normal distribution
mean = [0, 0] # Mean for x and y
cov = [[1, 0.8], [0.8, 1]] # Covariance matrix
data = np.random.multivariate_normal(mean, cov, size=1000)
# Convert data to two separate variables for clarity
x = data[:, 0] # x-axis data
y = data[:, 1] # y-axis data

# Plot the bivariate distribution using seaborn
plt.figure(figsize=(10, 6))
sns.kdeplot(x=x, y=y, cmap="Blues", fill=True, thresh=0.05)
sns.scatterplot(x=x, y=y, color='darkblue', alpha=0.3, s=10)
plt.title("Bivariate Distribution", fontsize=16)
plt.xlabel("X-axis", fontsize=14)
plt.ylabel("Y-axis", fontsize=14)
plt.grid()
plt.show()
```



```
!pip install bokeh geopandas pyproj
```

```
Requirement already satisfied: bokeh in  
/usr/local/lib/python3.10/dist-packages (3.6.2)  
Requirement already satisfied: geopandas in  
/usr/local/lib/python3.10/dist-packages (1.0.1)  
Requirement already satisfied: pyproj in  
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Requirement already satisfied: Jinja2>=2.9 in  
/usr/local/lib/python3.10/dist-packages (from bokeh) (3.1.4)  
Requirement already satisfied: contourpy>=1.2 in  
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Requirement already satisfied: numpy>=1.16 in  
/usr/local/lib/python3.10/dist-packages (from bokeh) (1.26.4)  
Requirement already satisfied: packaging>=16.8 in  
/usr/local/lib/python3.10/dist-packages (from bokeh) (24.2)  
Requirement already satisfied: pandas>=1.2 in  
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Requirement already satisfied: pillow>=7.1.0 in  
/usr/local/lib/python3.10/dist-packages (from bokeh) (11.0.0)  
Requirement already satisfied: PyYAML>=3.10 in  
/usr/local/lib/python3.10/dist-packages (from bokeh) (6.0.2)  
Requirement already satisfied: tornado>=6.2 in  
/usr/local/lib/python3.10/dist-packages (from bokeh) (6.3.3)  
Requirement already satisfied: xyzservices>=2021.09.1 in
```

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/usr/local/lib/python3.10/dist-packages (from bokeh) (2024.9.0)
Requirement already satisfied: pyogrio>=0.7.2 in
/usr/local/lib/python3.10/dist-packages (from geopandas) (0.10.0)
Requirement already satisfied: shapely>=2.0.0 in
/usr/local/lib/python3.10/dist-packages (from geopandas) (2.0.6)
Requirement already satisfied: certifi in /usr/local/lib/python3.10/dist-
packages (from pyproj) (2024.8.30) Requirement already satisfied:
MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from
Jinja2>=2.9->bokeh) (3.0.2) Requirement already satisfied: python-
dateutil>=2.8.2 in /usr/local/lib/python3.10/dist-packages (from
pandas>=1.2->bokeh) (2.8.2) Requirement already satisfied: pytz>=2020.1
in /usr/local/lib/python3.10/dist-packages (from pandas>=1.2->bokeh)
(2024.2) Requirement already satisfied: tzdata>=2022.7 in
/usr/local/lib/python3.10/dist-packages (from pandas>=1.2->bokeh)
(2024.2) Requirement already satisfied: six>=1.5 in
/usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.8.2-
>pandas>=1.2->bokeh) (1.16.0)
```

```
import geopandas as gpd
from bokeh.io import output_notebook, show
from bokeh.plotting import figure
from bokeh.models import GeoJSONDataSource, HoverTool,
ColumnDataSource
```

```
world = gpd.read_file('ne_10m_admin_0_countries.shp')
```

```
# Create a figure object
```

```
p = figure(title='Interactive Geospatial Data
Visualization',x_axis_type="mercator", y_axis_type="mercator")
```

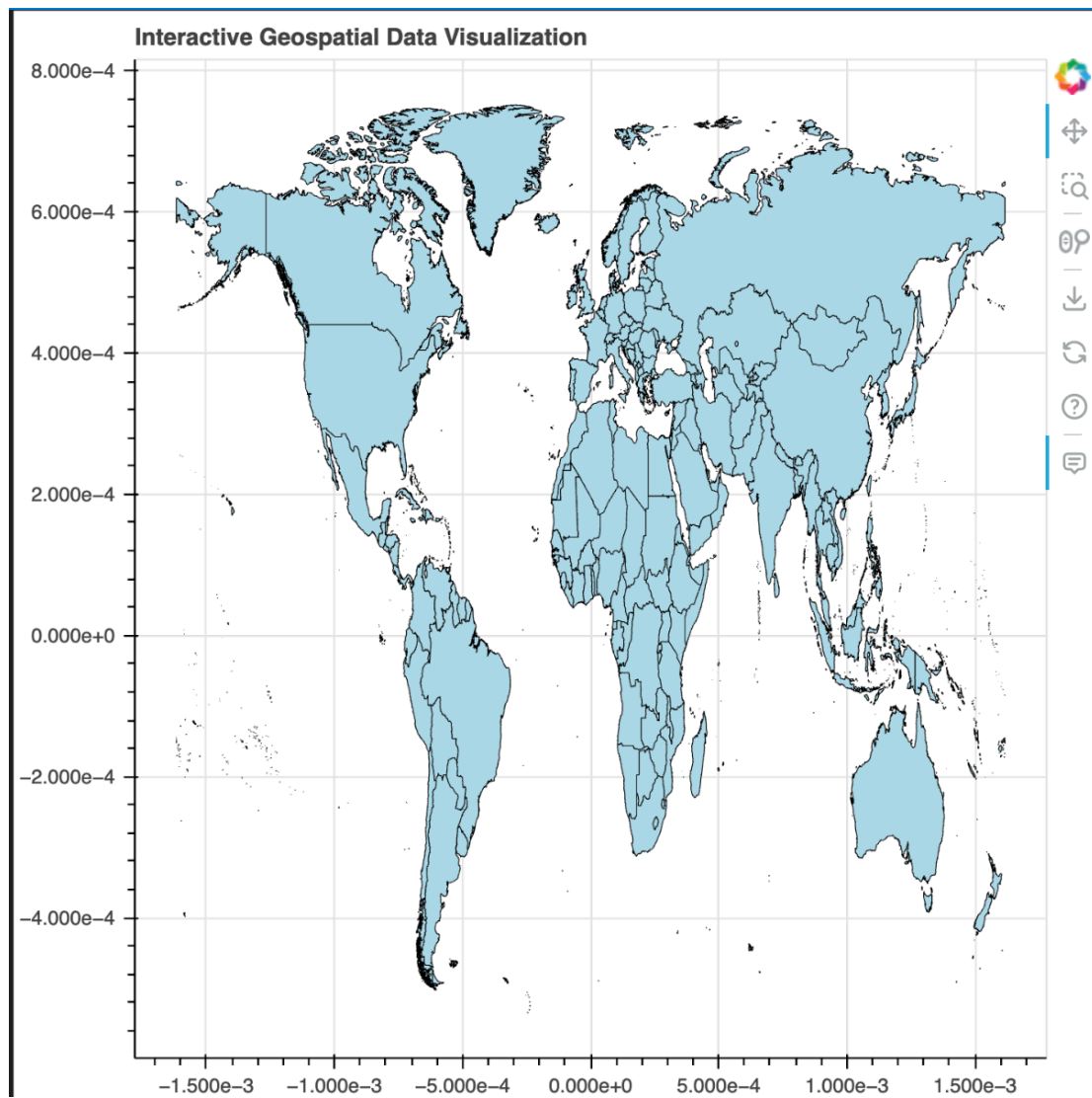
```
p.patches('xs', 'ys', source=geo_source,fill_color='lightblue',
line_color='black', line_width=0.5)
hover = HoverTool(tooltips=[('Country', '@name'), ('Population',
'@pop_est')])
p.add_tools(hover)
output_notebook()
show(p)
```

```
"use strict";\n(function(root) {\n
```

```
function now() {\n    return new
Date();\n}\n\nconst force = true;\n\nif (typeof
root._bokeh_onload_callbacks === \"undefined\" || force === true) {\n
root._bokeh_onload_callbacks = [];\n    root._bokeh_is_loading =
undefined;\n}\n\n\nif (typeof (root._bokeh_timeout) ===
\"undefined\" || force === true) {\n    root._bokeh_timeout =
Date.now() + 5000;\n    root._bokeh_failed_load = false;\n}\n\n
```

```
const NB_LOAD_WARNING = {text/html:\n      \<div\nstyle='background-color: #fdd'\n            \"\<p>\n\"BokehJS does not appear to have successfully loaded. If loading\nBokehJS from CDN, this \"may be due to a slow or bad\nnetwork connection. Possible fixes:\n\"</p>\n\"<ul>\n\"<li>re-run `output_notebook()` to attempt to\nload from CDN again, or</li>\n\"<li>use INLINE resources\ninstead, as so:</li>\n\"</ul>\n\"from bokeh.resources import INLINE\n\"output_notebook(resources=INLINE)\n\"</div>\"}};\nfunction display_loaded(error = null) {\n  const el = document.getElementById(null);\n  if (el != null) {\n    const html = (\n      => {\n        if (typeof root.Bokeh ===\n          \"undefined\") {\n          if (error == null) {\n            return\n              \"BokehJS is loading ...\";\n          } else {\n            return\n              \"BokehJS failed to load.\";\n          }\n        }\n        const prefix = `BokehJS ${root.Bokeh.version}`;\n        if (error\n          == null) {\n          return `${prefix} successfully loaded.`;\n        } else {\n          return `${prefix} <b>encountered errors</b>\nwhile loading\nand may not function as expected.`;\n        }\n      })()\n      .wrapper.style.overflow = \"hidden\";\n      if (error != null)\n        \"auto\";\n      const wrapper = document.createElement(\"div\");\n      wrapper.style.height =\n        \"5em\";\n      wrapper.style.resize = \"vertical\";\n      content = document.createElement(\"div\");\n      content.style.fontFamily = \"monospace\";\n      content.style.whiteSpace = \"pre-wrap\";\n      content.style.backgroundColor = \"rgb(255, 221, 221)\";\n      content.textContent = error.stack ?? error.toString();\n      wrapper.append(content);\n      el.append(wrapper);\n    } else if (Date.now() < root._bokeh_timeout) {\n      setTimeout(() =>\ndisplay_loaded(error), 100);\n    }\n  }\n}\nfunction run_callbacks()\n{\n  try {\n    root._bokeh_onload_callbacks.forEach(function(callback) {\n      if\n        (callback != null)\n        callback();\n      delete root._bokeh_onload_callbacks;\n    });\n    console.debug(\"Bokeh: all callbacks have finished\");\n    function load_libs(css_urls, js_urls, callback) {\n      if (css_urls ==\n        null)\n        css_urls = [];\n      if (js_urls == null)\n        js_urls = [];\n      root._bokeh_onload_callbacks.push(callback);\n      if\n        (root._bokeh_is_loading > 0) {\n          console.debug(\"Bokeh: BokehJS\nis being loaded,\nscheduling callback at\", now());\n          return\n            null;\n        } else if (js_urls == null || js_urls.length === 0) {\n          run_callbacks();\n          return null;\n        }\n        console.debug(\"Bokeh: BokehJS not loaded,\nscheduling load\nand callback at\", now());\n        root._bokeh_is_loading = css_urls.length +\n          js_urls.length;\n        function on_load() {\n          root._bokeh_is_loading--;\n          if (root._bokeh_is_loading === 0) {\n            console.debug(\"Bokeh: all BokehJS libraries/stylesheets loaded\");\n
```

Output:



```

run_callbacks()\n        }\n    }\n\n    function on_error(url) {\n        console.error(\"failed to load \" + url);\n    }\n\n    for (let i = 0; i < css_urls.length; i++) {\n        const url = css_urls[i];\n        const element = document.createElement(\"link\");\n        element.onload = on_load;\n        element.onerror = on_error.bind(null, url);\n        element.rel = \"stylesheet\";\n        element.type = \"text/css\";\n        element.href = url;\n        console.debug(\"Bokeh: injecting link tag for BokehJS stylesheet: \", url);\n        document.body.appendChild(element);\n    }\n\n    for (let i = 0; i < js_urls.length; i++) {\n        const url = js_urls[i];\n        const element = document.createElement('script');\n        element.onload = on_load;\n        element.onerror = on_error.bind(null, url);\n        element.async = false;\n        element.src = url;\n        console.debug(\"Bokeh: injecting script tag for BokehJS library: \", url);\n        document.head.appendChild(element);\n    }\n\n    function inject_raw_css(css) {\n        const element = document.createElement(\"style\");\n        element.appendChild(document.createTextNode(css));\n        document.body.appendChild(element);\n    }\n\n    const js_urls = [\n        \"https://cdn.bokeh.org/bokeh/release/bokeh-3.6.2.min.js\", \n        \"https://cdn.bokeh.org/bokeh/release/bokeh-gl-3.6.2.min.js\", \n        \"https://cdn.bokeh.org/bokeh/release/bokeh-widgets-3.6.2.min.js\", \n        \"https://cdn.bokeh.org/bokeh/release/bokeh-tables-3.6.2.min.js\", \n        \"https://cdn.bokeh.org/bokeh/release/bokeh-mathjax-3.6.2.min.js\";\n    ];\n\n    const css_urls = [];\n    const inline_js = [\n        function(Bokeh) {\n            Bokeh.set_log_level(\"info\");\n        },\n        function(Bokeh) {\n            \n        }\n    ];\n\n    function run_inline_js() {\n        if (root.Bokeh !== undefined || force === true) {\n            try {\n                for (let i = 0; i < inline_js.length; i++) {\n                    inline_js[i].call(root, root.Bokeh);\n                }\n            } catch (error) {\n                throw error;\n            }\n        } else if (Date.now() < root._bokeh_timeout) {\n            setTimeout(run_inline_js, 100);\n        } else if (!root._bokeh_failed_load) {\n            console.log(\"Bokeh: BokehJS failed to load within specified timeout.\");\n            root._bokeh_failed_load = true;\n        } else if (force !== true) {\n            const cell = $(document.getElementById(null)).parents('.cell').data().cell;\n            cell.output_area.append_execute_result(NB_LOAD_WARNING);\n        }\n\n        if (root._bokeh_is_loading === 0) {\n            console.debug(\"Bokeh: BokehJS loaded, going straight to plotting\");\n            run_inline_js();\n        } else {\n            load_libs(css_urls, js_urls, function() {\n                console.debug(\"Bokeh: BokehJS plotting callback run at\", now());\n                run_inline_js();\n            });\n        }\n    }(window);"

```

```

"""

```

```

import geopandas as gpd
from shapely.geometry import Point, LineString
import matplotlib.pyplot as plt

# Sample geospatial data (replace with your data)

```



```

cities = gpd.GeoDataFrame({
    'city': ['City A', 'City B', 'City C', 'City D'],
    'geometry': [Point(1, 1), Point(2, 2), Point(3, 1), Point(2, 0)],
})

connections = [
    ('City A', 'City B'),
    ('City B', 'City C'),
    ('City C', 'City D'),
    ('City D', 'City A'),
]

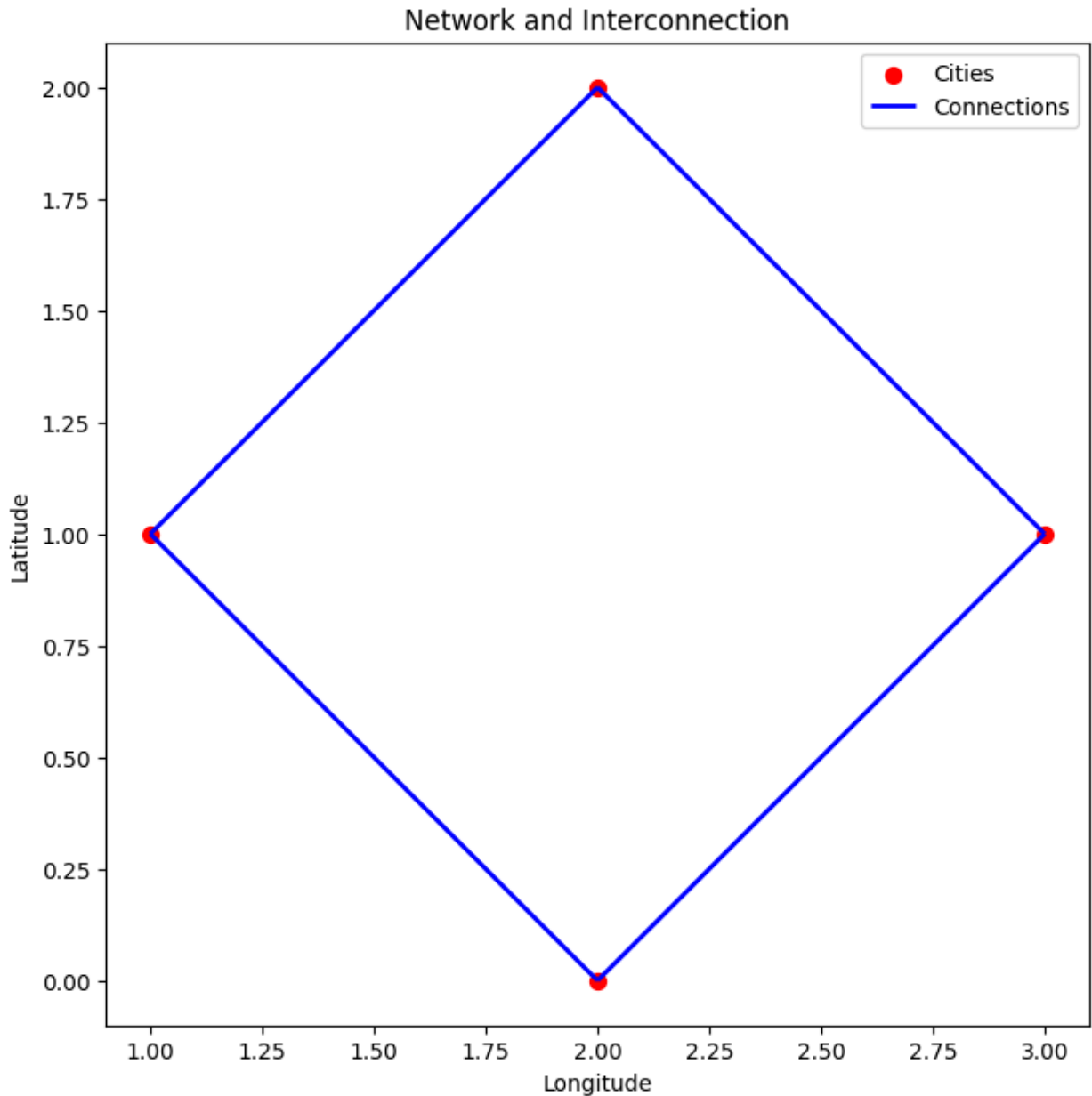
# Create LineString geometries for connections
lines = []
for city1, city2 in connections:
    point1 = cities[cities['city'] == city1].geometry.iloc[0]
    point2 = cities[cities['city'] == city2].geometry.iloc[0]
    line = LineString([point1, point2])
    lines.append(line)

# Create GeoDataFrame for connections
connections_gdf = gpd.GeoDataFrame({'geometry': lines})

# Plot the data
fig, ax = plt.subplots(figsize=(8, 8))
cities.plot(ax=ax, marker='o', color='red', markersize=50,
label='Cities')
connections_gdf.plot(ax=ax, color='blue', linewidth=2,
label='Connections')

# Customize the plot
ax.set_xlabel('Longitude')
ax.set_ylabel('Latitude')
ax.set_title('Network and Interconnection')
ax.legend()
plt.show()

```



```
!pip install requests beautifulsoup4
```

```
Requirement already satisfied: requests in  
/usr/local/lib/python3.10/dist-packages (2.32.3)  
Requirement already satisfied: beautifulsoup4 in  
/usr/local/lib/python3.10/dist-packages (4.12.3)  
Requirement already satisfied: charset-normalizer<4,>=2 in  
/usr/local/lib/python3.10/dist-packages (from requests) (3.4.0)  
Requirement already satisfied: idna<4,>=2.5 in  
/usr/local/lib/python3.10/dist-packages (from requests) (3.10)  
Requirement already satisfied: urllib3<3,>=1.21.1 in  
/usr/local/lib/python3.10/dist-packages (from requests) (2.2.3)
```

Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.10/dist-packages (from requests) (2024.8.30)
Requirement already satisfied: soupsieve>1.2 in
/usr/local/lib/python3.10/dist-packages (from beautifulsoup4) (2.6)

Install necessary libraries

!pip install requests beautifulsoup4

import requests

from bs4 import BeautifulSoup

import os

import shutil

Step 1: Define the URL to scrape

url = "https://en.wikipedia.org/wiki/Main_Page"

Wikipedia main page

Step 2: Make an HTTP GET request to fetch the HTML content

response = requests.get(url)

if response.status_code == 200:
 print("Website fetched successfully.")

else:
 print(f"Failed to fetch the website. Status code:
{response.status_code}")
 exit()

Step 3: Parse the HTML using BeautifulSoup

soup = BeautifulSoup(response.content, 'html.parser')

*# Step 4: Extract the first image source (you can modify to target
specific elements)*

image_tag = soup.find('img')

if image_tag and 'src' in image_tag.attrs:
 image_url = image_tag['src']
 if not image_url.startswith('http'): *# Handle relative URLs*
 image_url = requests.compat.urljoin(url, image_url)
 print(f"Image URL: {image_url}")
else:
 print("No image found on the page.")
 exit()

Step 5: Retrieve the image over HTTP

image_response = requests.get(image_url, stream=True)

if image_response.status_code == 200:
 print("Image retrieved successfully.")

Step 6: Save the image locally

image_filename = os.path.basename(image_url)

with open(image_filename, 'wb') as f:
 shutil.copyfileobj(image_response.raw, f)
 print(f"Image saved as {image_filename}.")

else:

```

        print(f"Failed to fetch the image. Status code:
{image_response.status_code}")
# Step 7: Additional Scraping (e.g., extracting all hyperlinks)
print("\nExtracting all hyperlinks from the page:")
for link in soup.find_all('a', href=True):
    href = link['href']
    full_url = requests.compat.urljoin(url, href)           # Handle relative
URLs
    print(full_url)

```

Website fetched successfully.

Image URL: <https://en.wikipedia.org/static/images/icons/wikipedia.png>

Image retrieved successfully.

Image saved as wikipedia.png.

Extracting all hyperlinks from the page:

https://en.wikipedia.org/wiki/Main_Page#bodyContent

https://en.wikipedia.org/wiki/Main_Page

<https://en.wikipedia.org/wiki/Wikipedia:Contents>

https://en.wikipedia.org/wiki/Portal:Current_events

<https://en.wikipedia.org/wiki/Special:Random>

<https://en.wikipedia.org/wiki/Wikipedia:About>

https://en.wikipedia.org/wiki/Wikipedia:Contact_us

<https://en.wikipedia.org/wiki/Help:Contents>

<https://en.wikipedia.org/wiki/Help:Introduction>

https://en.wikipedia.org/wiki/Wikipedia:Community_portal

<https://en.wikipedia.org/wiki/Special:RecentChanges>

https://en.wikipedia.org/wiki/Wikipedia:File_upload_wizard

https://en.wikipedia.org/wiki/Main_Page

<https://en.wikipedia.org/wiki/Special:Search>

<https://donate.wikimedia.org/?>

[wmf_source=donate&wmf_medium=sidebar&wmf_campaign=en.wikipedia.org&use
lang=en](https://donate.wikimedia.org/?wmf_source=donate&wmf_medium=sidebar&wmf_campaign=en.wikipedia.org&use_lang=en)

<https://en.wikipedia.org/w/index.php?>

[title=Special:CreateAccount&returnto=Main+Page](https://en.wikipedia.org/w/index.php?title=Special:CreateAccount&returnto=Main+Page)

<https://en.wikipedia.org/w/index.php?>

[title=Special:UserLogin&returnto=Main+Page](https://en.wikipedia.org/w/index.php?title=Special:UserLogin&returnto=Main+Page)

<https://donate.wikimedia.org/?>

[wmf_source=donate&wmf_medium=sidebar&wmf_campaign=en.wikipedia.org&use
lang=en](https://donate.wikimedia.org/?wmf_source=donate&wmf_medium=sidebar&wmf_campaign=en.wikipedia.org&use_lang=en)

<https://en.wikipedia.org/w/index.php?>

[title=Special:CreateAccount&returnto=Main+Page](https://en.wikipedia.org/w/index.php?title=Special:CreateAccount&returnto=Main+Page)

<https://en.wikipedia.org/w/index.php?>

[title=Special:UserLogin&returnto=Main+Page](https://en.wikipedia.org/w/index.php?title=Special:UserLogin&returnto=Main+Page)

<https://en.wikipedia.org/wiki/Help:Introduction>

<https://en.wikipedia.org/wiki/Special:MyContributions>

<https://en.wikipedia.org/wiki/Special:MyTalk>

https://en.wikipedia.org/wiki/Main_Page

https://en.wikipedia.org/wiki/Talk:Main_Page

https://en.wikipedia.org/wiki/Main_Page
https://en.wikipedia.org/w/index.php?title=Main_Page&action=edit
https://en.wikipedia.org/w/index.php?title=Main_Page&action=history
https://en.wikipedia.org/wiki/Main_Page
https://en.wikipedia.org/w/index.php?title=Main_Page&action=edit
https://en.wikipedia.org/w/index.php?title=Main_Page&action=history
https://en.wikipedia.org/wiki/Special:WhatLinksHere/Main_Page
https://en.wikipedia.org/wiki/Special:RecentChangesLinked/Main_Page
https://en.wikipedia.org/wiki/Wikipedia:File_Upload_Wizard
<https://en.wikipedia.org/wiki/Special:SpecialPages>
https://en.wikipedia.org/w/index.php?title=Main_Page&oldid=1225315602
https://en.wikipedia.org/w/index.php?title=Main_Page&action=info
https://en.wikipedia.org/w/index.php?title=Special:CiteThisPage&page=Main_Page&id=1225315602&wpFormIdentifier=titleform
https://en.wikipedia.org/w/index.php?title=Special:UrlQ%C4%B1sald%C4%B1c%C4%B1s%C4%B1&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FMain_Page
https://en.wikipedia.org/w/index.php?title=Special:QrKodu&url=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FMain_Page
https://en.wikipedia.org/w/index.php?title=Special:DownloadAsPdf&page=Main_Page&action=show-download-screen
https://en.wikipedia.org/w/index.php?title=Main_Page&printable=yes
https://commons.wikimedia.org/wiki/Main_Page
<https://foundation.wikimedia.org/wiki/Home>
<https://www.mediawiki.org/wiki/MediaWiki>
https://meta.wikimedia.org/wiki/Main_Page
https://outreach.wikimedia.org/wiki/Main_Page
https://wikisource.org/wiki/Main_Page
https://species.wikimedia.org/wiki/Main_Page
https://en.wikibooks.org/wiki/Main_Page
https://www.wikidata.org/wiki/Wikidata:Main_Page
https://www.wikifunctions.org/wiki/Wikifunctions:Main_Page
<https://wikimania.wikimedia.org/wiki/Wikimania>
https://en.wikinews.org/wiki/Main_Page
https://en.wikiquote.org/wiki/Main_Page
https://en.wikisource.org/wiki/Main_Page
https://en.wikiversity.org/wiki/Wikiversity:Main_Page
https://en.wikivoyage.org/wiki/Main_Page
https://en.wiktory.org/wiki/Wiktory:Main_Page
<https://www.wikidata.org/wiki/Special:EntityPage/Q5296>
<https://en.wikipedia.org/wiki/Wikipedia>
https://en.wikipedia.org/wiki/Free_content
<https://en.wikipedia.org/wiki/Encyclopedia>
https://en.wikipedia.org/wiki/Help:Introduction_to_Wikipedia
<https://en.wikipedia.org/wiki/Special:Statistics>
https://en.wikipedia.org/wiki/English_language
https://en.wikipedia.org/wiki/File:Golding_Bird.jpg
https://en.wikipedia.org/wiki/Golding_Bird

https://en.wikipedia.org/wiki/Kidney_stone_disease
https://en.wikipedia.org/wiki/Guy%27s_Hospital
<https://en.wikipedia.org/wiki/Electrotherapy>
https://en.wikipedia.org/wiki/Daniell_cell
<https://en.wikipedia.org/wiki/Electrometallurgy>
<https://en.wikipedia.org/wiki/Stethoscope>
<https://en.wikipedia.org/wiki/Hyperoxaluria>
https://en.wikipedia.org/wiki/Golding_Bird
https://en.wikipedia.org/wiki/You_Belong_with_Me
https://en.wikipedia.org/wiki/Wilfred_Arthur
https://en.wikipedia.org/wiki/%C3%89cole_Polytechnique_massacre
https://en.wikipedia.org/wiki/Wikipedia:Today%27s_featured_article/December_2024
<https://lists.wikimedia.org/postorius/lists/daily-article-l.lists.wikimedia.org/>
https://en.wikipedia.org/wiki/Wikipedia:Featured_articles
https://en.wikipedia.org/wiki/Wikipedia:About_Today%27s_featured_article
https://en.wikipedia.org/wiki/File:Lizzie_Esau_in_2024.png
https://en.wikipedia.org/wiki/Lizzie_Esau
[https://en.wikipedia.org/wiki/I%27m_a_Man_\(Bo_Diddley_song\)](https://en.wikipedia.org/wiki/I%27m_a_Man_(Bo_Diddley_song))
https://en.wikipedia.org/wiki/My_Lady_Jane
https://en.wikipedia.org/wiki/Lady_Jane_Grey
https://en.wikipedia.org/wiki/Omar_Amiralay
https://en.wikipedia.org/wiki/Film_Essay_on_the_Euphrates_Dam
https://en.wikipedia.org/wiki/A_Flood_in_Baath_Country
https://en.wikipedia.org/wiki/Celeste_Caeiro
https://en.wikipedia.org/wiki/Carnation_Revolution
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title=Main_Page&mobileaction=toggle_view_mobile
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```

import requests

Web service URL (using JSONPlaceholder for testing)

```
url = "https://jsonplaceholder.typicode.com/posts"    # Example URL for
posts
```

Make a request to the web service

```

try:
    response = requests.get(url)
    # Check if the request was successful
    response.raise_for_status()    # Raise an exception for HTTP errors
    (e.g., 404, 500)

    # Parse the JSON response
    posts = response.json()    # JSON data is parsed directly into
    Python objects

    # Access data from JSON response
    for post in posts:
        title = post['title']
        body = post['body']
        print(f"Title: {title}, Body: {body}")

except requests.exceptions.RequestException as e:
    print(f"Error with the request: {e}")

```

Title: sunt aut facere repellat provident occaecati excepturi optio
 reprehenderit, Body: quia et suscipit
 suscipit recusandae consequuntur expedita et cum
 reprehenderit molestiae ut ut quas totam
 nostrum rerum est autem sunt rem eveniet architecto
 Title: qui est esse, Body: est rerum tempore vitae
 sequi sint nihil reprehenderit dolor beatae ea dolores neque
 fugiat blanditiis voluptate porro vel nihil molestiae ut reiciendis
 qui aperiam non debitis possimus qui neque nisi nulla
 Title: ea molestias quasi exercitationem repellat qui ipsa sit aut,
 Body: et iusto sed quo iure
 voluptatem occaecati omnis eligendi aut ad
 voluptatem doloribus vel accusantium quis pariatur
 molestiae porro eius odio et labore et velit aut
 Title: eum et est occaecati, Body: ullam et saepe reiciendis
 voluptatem adipisci
 sit amet autem assumenda provident rerum culpa
 quis hic commodi nesciunt rem tenetur doloremque ipsam iure
 quis sunt voluptatem rerum illo velit
 Title: nesciunt quas odio, Body: repudiandae veniam quaerat sunt sed
 alias aut fugiat sit autem sed est
 voluptatem omnis possimus esse voluptatibus quis
 est aut tenetur dolor neque
 Title: dolorem eum magni eos aperiam quia, Body: ut aspernatur
 corporis harum nihil quis provident sequi
 mollitia nobis aliquid molestiae
 perspiciatis et ea nemo ab reprehenderit accusantium quas
 voluptate dolores velit et doloremque molestiae
 Title: magnam facilis autem, Body: dolore placeat quibusdam ea quo
 vitae

magni quis enim qui quis quo nemo aut saepe
quidem repellat excepturi ut quia
sunt ut sequi eos ea sed quas
Title: dolorem dolore est ipsam, Body: dignissimos aperiam dolorem qui
eum
facilis quibusdam animi sint suscipit qui sint possimus cum
quaerat magni maiores excepturi
ipsam ut commodi dolor voluptatum modi aut vitae
Title: nesciunt iure omnis dolorem tempora et accusantium, Body:
consectetur animi nesciunt iure dolore
enim quia ad
veniam autem ut quam aut nobis
et est aut quod aut provident voluptas autem voluptas
Title: optio molestias id quia eum, Body: quo et expedita modi cum
officia vel magni
doloribus qui repudiandae
vero nisi sit
quos veniam quod sed accusamus veritatis error
Title: et ea vero quia laudantium autem, Body: delectus reiciendis
molestiae occaecati non minima eveniet qui voluptatibus
accusamus in eum beatae sit
vel qui neque voluptates ut commodi qui incidunt
ut animi commodi
Title: in quibusdam tempore odit est dolorem, Body: itaque id aut
magnam
praesentium quia et ea odit et ea voluptas et
sapiente quia nihil amet occaecati quia id voluptatem
incidunt ea est distinctio odio
Title: dolorum ut in voluptas mollitia et saepe quo animi, Body: aut
dicta possimus sint mollitia voluptas commodi quo doloremque
iste corrupti reiciendis voluptatem eius rerum
sit cumque quod eligendi laborum minima
perferendis recusandae assumenda consectetur porro architecto ipsum
ipsam
Title: voluptatem eligendi optio, Body: fuga et accusamus dolorum
perferendis illo voluptas
non doloremque neque facere
ad qui dolorum molestiae beatae
sed aut voluptas totam sit illum
Title: eveniet quod temporibus, Body: reprehenderit quos placeat
velit minima officia dolores impedit repudiandae molestiae nam
voluptas recusandae quis delectus
officiis harum fugiat vitae
Title: sint suscipit perspiciatis velit dolorum rerum ipsa laboriosam
odio, Body: suscipit nam nisi quo aperiam aut
asperiores eos fugit maiores voluptatibus quia
voluptatem quis ullam qui in alias quia est
consequatur magni mollitia accusamus ea nisi voluptate dicta
Title: fugit voluptas sed molestias voluptatem provident, Body: eos

voluptas et aut odit natus earum
aspernatur fuga molestiae ullam
deserunt ratione qui eos
qui nihil ratione nemo velit ut aut id quo
Title: voluptate et itaque vero tempora molestiae, Body: eveniet quo
quis
laborum totam consequatur non dolor
ut et est repudiandae
est voluptatem vel debitis et magnam
Title: adipisci placeat illum aut reiciendis qui, Body: illum quis
cupiditate provident sit magnam
ea sed aut omnis
veniam maiores ullam consequatur atque
adipisci quo iste expedita sit quos voluptas
Title: doloribus ad provident suscipit at, Body: qui consequuntur
ducimus possimus quisquam amet similique
suscipit porro ipsam amet
eos veritatis officiis exercitationem vel fugit aut necessitatibus
totam
omnis rerum consequatur expedita quidem cumque explicabo
Title: asperiores ea ipsam voluptatibus modi minima quia sint, Body:
repellat aliquid praesentium dolorem quo
sed totam minus non itaque
nihil labore molestiae sunt dolor eveniet hic recusandae veniam
tempora et tenetur expedita sunt
Title: dolor sint quo a velit explicabo quia nam, Body: eos qui et
ipsum ipsam suscipit aut
sed omnis non odio
expedita earum mollitia molestiae aut atque rem suscipit
nam impedit esse
Title: maxime id vitae nihil numquam, Body: veritatis unde neque
eligendi
quae quod architecto quo neque vitae
est illo sit tempora doloremque fugit quod
et et vel beatae sequi ullam sed tenetur perspiciatis
Title: autem hic labore sunt dolores incidunt, Body: enim et ex nulla
omnis voluptas quia qui
voluptatem consequatur numquam aliquam sunt
totam recusandae id dignissimos aut sed asperiores deserunt
Title: rem alias distinctio quo quis, Body: ullam consequatur ut
omnis quis sit vel consequuntur
ipsa eligendi ipsum molestiae et omnis error nostrum
molestiae illo tempore quia et distinctio
Title: est et quae odit qui non, Body: similique esse doloribus nihil
accusamus
omnis dolorem fuga consequuntur reprehenderit fugit recusandae
temporibus
perspiciatis cum ut laudantium
omnis aut molestiae vel vero

Title: quasi id et eos tenetur aut quo autem, Body: eum sed dolores ipsam sint possumus debitis occaecati debitis qui qui et ut placeat enim earum aut odit facilis consequatur suscipit necessitatibus rerum sed inventore temporibus consequatur

Title: delectus ullam et corporis nulla voluptas sequi, Body: non et quaerat ex quae ad maiores maiores recusandae totam aut blanditiis mollitia quas illo ut voluptatibus voluptatem similique nostrum eum

Title: iusto eius quod necessitatibus culpa ea, Body: odit magnam ut saepe sed non qui tempora atque nihil accusamus illum doloribus illo dolor

eligendi repudiandae odit magni similique sed cum maiores Title: a quo magni similique perferendis, Body: alias dolor cumque impedit blanditiis non eveniet odio maxime blanditiis amet eius quis tempora quia autem rem a provident perspiciatis quia

Title: ullam ut quidem id aut vel consequuntur, Body: debitis eius sed quibusdam non quis consectetur vitae impedit ut qui consequatur sed aut in quidem sit nostrum et maiores adipisci atque quaerat voluptatem adipisci repudiandae

Title: doloremque illum aliquid sunt, Body: deserunt eos nobis asperiores et hic est debitis repellat molestiae optio

nihil ratione ut eos beatae quibusdam distinctio maiores earum voluptates et aut adipisci ea maiores voluptas maxime

Title: qui explicabo molestiae dolorem, Body: rerum ut et numquam laborum odit est sit id qui sint in

quasi tenetur tempore aperiam et quaerat qui in rerum officiis sequi cumque quod

Title: magnam ut rerum iure, Body: ea velit perferendis earum ut voluptatem voluptate itaque iusto totam pariat in

nemo voluptatem voluptatem autem magni tempora minima in est distinctio qui assumenda accusamus dignissimos officia nesciunt nobis

Title: id nihil consequatur molestias animi provident, Body: nisi error delectus possumus ut eligendi vitae placeat eos harum cupiditate facilis reprehenderit voluptatem beatae modi ducimus quo illum voluptas eligendi et nobis quia fugit

Title: fuga nam accusamus voluptas reiciendis itaque, Body: ad mollitia et omnis minus architecto odit voluptas doloremque maxime aut non ipsa qui alias veniam

blanditiis culpa aut quia nihil cumque facere et occaecati
qui aspernatur quia eaque ut aperiam inventore
Title: provident vel ut sit ratione est, Body: debitis et eaque non
officia sed nesciunt pariatur vel
voluptatem iste vero et ea
numquam aut expedita ipsum nulla in
voluptates omnis consequatur aut enim officiis in quam qui
Title: explicabo et eos deleniti nostrum ab id repellendus, Body:
animi esse sit aut sit nesciunt assumenda eum voluptas
quia voluptatibus provident quia necessitatibus ea
rerum repudiandae quia voluptatem delectus fugit aut id quia
ratione optio eos iusto veniam iure
Title: eos dolorem iste accusantium est eaque quam, Body: corporis
rerum ducimus vel eum accusantium
maxime aspernatur a porro possimus iste omnis
est in deleniti asperiores fuga aut
voluptas sapiente vel dolore minus voluptatem incidunt ex
Title: enim quo cumque, Body: ut voluptatum aliquid illo tenetur nemo
sequi quo facilis
ipsum rem optio mollitia quas
voluptatem eum voluptas qui
unde omnis voluptatem iure quasi maxime voluptas nam
Title: non est facere, Body: molestias id nostrum
excepturi molestiae dolore omnis repellendus quaerat saepe
consectetur iste quaerat tenetur asperiores accusamus ex ut
nam quidem est ducimus sunt debitis saepe
Title: commodi ullam sint et excepturi error explicabo praesentium
voluptas, Body: odio fugit voluptatum ducimus earum autem est incidunt
voluptatem
odit reiciendis aliquam sunt sequi nulla dolorem
non facere repellendus voluptates quia
ratione harum vitae ut
Title: eligendi iste nostrum consequuntur adipisci praesentium sit
beatae perferendis, Body: similique fugit est
illum et dolorum harum et voluptate eaque quidem
exercitationem quos nam commodi possimus cum odio nihil nulla
dolorum exercitationem magnam ex et a et distinctio debitis
Title: optio dolor molestias sit, Body: temporibus est consectetur
dolore
et libero debitis vel velit laboriosam quia
ipsum quibusdam qui itaque fuga rem aut
ea et iure quam sed maxime ut distinctio quae
Title: ut numquam possimus omnis eius suscipit laudantium iure, Body:
est natus reiciendis nihil possimus aut provident
ex et dolor
repellat pariatur est
nobis rerum repellendus dolorem autem
Title: aut quo modi neque nostrum ducimus, Body: voluptatem quisquam
iste

voluptatibus natus officiis facilis dolorem quis quas ipsam vel et voluptatum in aliquid Title: quibusdam cumque rem aut deserunt, Body: voluptatem assumenda ut qui ut cupiditate aut impedit veniam occaecati nemo illum voluptatem laudantium molestiae beatae rerum ea iure soluta nostrum eligendi et voluptate Title: ut voluptatem illum ea doloribus itaque eos, Body: voluptates quo voluptatem facilis iure occaecati vel assumenda rerum officia et illum perspiciatis ab deleniti laudantium repellat ad ut et autem reprehenderit Title: laborum non sunt aut ut assumenda perspiciatis voluptas, Body: inventore ab sint natus fugit id nulla sequi architecto nihil quaerat eos tenetur in in eum veritatis non quibusdam officiis aspernatur cumque aut commodi aut Title: repellendus qui recusandae incidunt voluptates tenetur qui omnis exercitationem, Body: error suscipit maxime adipisci consequuntur recusandae voluptas eligendi et est et voluptates quia distinctio ab amet quaerat molestiae et vitae adipisci impedit sequi nesciunt quis consectetur Title: soluta aliquam aperiam consequatur illo quis voluptas, Body: sunt dolores aut doloribus dolore doloribus voluptates tempora et doloremque et quo cum asperiores sit consectetur dolorem Title: qui enim et consequuntur quia animi quis voluptate quibusdam, Body: iusto est quibusdam fuga quas quaerat molestias a enim ut sit accusamus enim temporibus iusto accusantium provident architecto soluta esse reprehenderit qui laborum Title: ut quo aut ducimus alias, Body: minima harum praesentium eum rerum illo dolore quasi exercitationem rerum nam porro quis neque quo consequatur minus dolor quidem veritatis sunt non explicabo similique Title: sit asperiores ipsam eveniet odio non quia, Body: totam corporis dignissimos vitae dolorem ut occaecati accusamus ex velit deserunt et exercitationem vero incidunt corrupti mollitia Title: sit vel voluptatem et non libero, Body: debitis excepturi ea perferendis harum libero optio eos accusamus cum fuga ut sapiente repudiandae et ut incidunt omnis molestiae nihil ut eum odit

Title: qui et at rerum necessitatibus, Body: aut est omnis dolores
neque rerum quod ea rerum velit pariatu beatae excepturi
et provident voluptas corrupti
corporis harum reprehenderit dolores eligendi
Title: sed ab est est, Body: at pariatu consequuntur earum quidem
quo est laudantium soluta voluptatem
qui ullam et est
et cum voluptas voluptatum repellat est
Title: voluptatum itaque dolores nisi et quasi, Body: veniam
voluptatum quae adipisci id
et id quia eos ad et dolorem
aliquam quo nisi sunt eos impedit error
ad similique veniam
Title: qui commodi dolor at maiores et quis id accusantium, Body:
perspiciatis et quam ea autem temporibus non voluptatibus qui
beatae a earum officia nesciunt dolores suscipit voluptas et
animi doloribus cum rerum quas et magni
et hic ut ut commodi expedita sunt
Title: consequatur placeat omnis quisquam quia reprehenderit fugit
veritatis facere, Body: asperiores sunt ab assumenda cumque modi velit
qui esse omnis
voluptate et fuga perferendis voluptas
illo ratione amet aut et omnis
Title: voluptatem doloribus consectetur est ut ducimus, Body: ab nemo
optio odio
delectus tenetur corporis similique nobis repellendus rerum omnis
facilis
vero blanditiis debitis in nesciunt doloribus dicta dolores
magnam minus velit
Title: beatae enim quia vel, Body: enim aspernatur illo distinctio
quae praesentium
beatae alias amet delectus qui voluptate distinctio
odit sint accusantium autem omnis
quo molestiae omnis ea eveniet optio
Title: voluptas blanditiis repellendus animi ducimus error sapiente et
suscipit, Body: enim adipisci aspernatur nemo
numquam omnis facere dolorem dolor ex quis temporibus incidunt
ab delectus culpa quo reprehenderit blanditiis asperiores
accusantium ut quam in voluptatibus voluptas ipsam dicta
Title: et fugit quas eum in in aperiam quod, Body: id velit blanditiis
eum ea voluptatem
molestiae sint occaecati est eos perspiciatis
incidunt a error provident eaque aut aut qui
Title: consequatur id enim sunt et et, Body: voluptatibus ex esse
sint explicabo est aliquid cumque adipisci fuga repellat labore
molestiae corrupti ex saepe at asperiores et perferendis
natus id esse incidunt pariatu
Title: repudiandae ea animi iusto, Body: officia veritatis tenetur
vero qui itaque

sint non ratione sed et ut asperiores iusto eos molestiae nostrum veritatis quibusdam et nemo iusto saepe Title: aliquid eos sed fuga est maxime repellendus, Body: reprehenderit id nostrum voluptas doloremque pariat sint et accusantium quia quod aspernatur et fugiat amet non sapiente et consequatur necessitatibus molestiae Title: odio quis facere architecto reiciendis optio, Body: magnam molestiae perferendis quisquam qui cum reiciendis quaerat animi amet hic inventore ea quia deleniti quidem saepe porro velit Title: fugiat quod pariat odit minima, Body: officii error culpa consequatur modi asperiores et dolorum assumenda voluptas et vel qui aut vel rerum voluptatum quisquam perspiciatis quia rerum consequatur totam quas sequi commodi repudiandae asperiores et saepe a Title: voluptatem laborum magni, Body: sunt repellendus quae est asperiores aut deleniti esse accusamus repellendus quia aut quia dolorem unde eum tempora esse dolore Title: et iusto veniam et illum aut fuga, Body: occaecati a doloribus iste saepe consecetur placeat eum voluptate dolorem et qui quo quia voluptas rerum ut id enim velit est perferendis Title: sint hic doloribus consequatur eos non id, Body: quam occaecati qui deleniti consecetur consequatur aut facere quas exercitationem aliquam hic voluptas neque id sunt ut aut accusamus sunt consecetur expedita inventore velit Title: consequuntur deleniti eos quia temporibus ab aliquid at, Body: voluptatem cumque tenetur consequatur expedita ipsum nemo quia explicabo aut eum minima consequatur tempore cumque quae est et et in consequuntur voluptatem voluptates aut Title: enim unde ratione doloribus quas enim ut sit sapiente, Body: odit qui et et necessitatibus sint veniam mollitia amet doloremque molestiae commodi similique magnam et quam blanditiis est itaque quo et tenetur ratione occaecati molestiae tempora Title: dignissimos eum dolor ut enim et delectus in, Body: commodi non non omnis et voluptas sit autem aut nobis magnam et sapiente voluptatem et laborum repellat qui delectus facilis temporibus rerum amet et nemo voluptate expedita adipisci error dolorem Title: doloremque officii ad et non perferendis, Body: ut animi facere

totam iusto tempore molestiae eum aut et dolorem aperiam quaerat recusandae totam odio Title: necessitatibus quasi exercitationem odio, Body: modi ut in nulla repudiandae dolorum nostrum eos aut consequatur omnis ut incidunt est omnis iste et quam voluptates sapiente aliquam asperiores nobis amet corrupti repudiandae provident Title: quam voluptatibus rerum veritatis, Body: nobis facilis odit tempore cupiditate quia assumenda doloribus rerum qui ea illum et qui totam aut veniam repellendus Title: pariat consequatur quia magnam autem omnis non amet, Body: libero accusantium et et facere incidunt sit dolorem non excepturi qui quia sed laudantium quisquam molestiae ducimus est officii esse molestiae iste et quos Title: labore in ex et explicabo corporis aut quas, Body: ex quod dolorem ea eum iure qui provident amet quia qui facere excepturi et repudiandae asperiores molestias provident minus incidunt vero fugit rerum sint sunt excepturi provident Title: tempora rem veritatis voluptas quo dolores vero, Body: facere qui nesciunt est voluptatum voluptatem nisi sequi eligendi necessitatibus ea at rerum itaque harum non ratione velit laboriosam quis consequuntur ex officiis minima doloremque voluptas ut aut Title: laudantium voluptate suscipit sunt enim enim, Body: ut libero sit aut totam inventore sunt porro sint qui sunt molestiae consequatur cupiditate qui iste ducimus adipisci dolor enim assumenda soluta laboriosam amet iste delectus hic Title: odit et voluptates doloribus alias odio et, Body: est molestiae facilis quis tempora numquam nihil qui voluptate sapiente consequatur est qui necessitatibus autem aut ipsa aperiam modi dolore numquam reprehenderit eius rem quibusdam Title: optio ipsam molestias necessitatibus occaecati facilis veritatis dolores aut, Body: sint molestiae magni a et quos eaque et quasi ut rerum debitis similique veniam recusandae dignissimos dolor incidunt consequatur odio Title: dolore veritatis porro provident adipisci blanditiis et sunt, Body: similique sed nisi voluptas iusto omnis mollitia et quo assumenda suscipit officia magnam sint sed tempora enim provident pariat praesentium atque animi amet ratione

Title: placeat quia et porro iste, Body: quasi excepturi consequatur
iste autem temporibus sed molestiae beatae
et quaerat et esse ut

voluptatem occaecati et vel explicabo autem
asperiores pariatur deserunt optio

Title: nostrum quis quasi placeat, Body: eos et molestiae
nesciunt ut a

dolores perspiciatis repellendus repellat aliquid
magnam sint rem ipsum est

Title: sapiente omnis fugit eos, Body: consequatur omnis est
praesentium

ducimus non iste

neque hic deserunt

voluptatibus veniam cum et rerum sed

Title: sint soluta et vel magnam aut ut sed qui, Body: repellat aut
aperiam totam temporibus autem et

architecto magnam ut

consequatur qui cupiditate rerum quia soluta dignissimos nihil iure
tempore quas est

Title: ad iusto omnis odit dolor voluptatibus, Body: minus omnis
soluta quia

qui sed adipisci voluptates illum ipsam voluptatem
eligendi officia ut in

eos soluta similique molestias praesentium blanditiis

Title: aut amet sed, Body: libero voluptate eveniet aperiam sed
sunt placeat suscipit molestias

similique fugit nam natus

expedita consequatur consequatur dolores quia eos et placeat

Title: ratione ex tenetur perferendis, Body: aut et excepturi dicta
laudantium sint rerum nihil

laudantium et at

a neque minima officia et similique libero et
commodi voluptate qui

Title: beatae soluta recusandae, Body: dolorem quibusdam ducimus
consequuntur dicta aut quo laboriosam

voluptatem quis enim recusandae ut sed sunt
nostrum est odit totam

sit error sed sunt eveniet provident qui nulla

Title: qui qui voluptates illo iste minima, Body: aspernatur expedita
soluta quo ab ut similique

expedita dolores amet

sed temporibus distinctio magnam saepe deleniti

omnis facilis nam ipsum natus sint similique omnis

Title: id minus libero illum nam ad officiis, Body: earum voluptatem
facere provident blanditiis velit laboriosam

pariatur accusamus odio saepe

cumque dolor qui a dicta ab doloribus consequatur omnis

corporis cupiditate eaque assumenda ad nesciunt

Title: quaerat velit veniam amet cupiditate aut numquam ut sequi,

Body: in non odio excepturi sint eum
labore voluptates vitae quia qui et
inventore itaque rerum
veniam non exercitationem delectus aut
Title: quas fugiat ut perspiciatis vero provident, Body: eum non
blanditiis soluta porro quibusdam voluptas
vel voluptatem qui placeat dolores qui velit aut
vel inventore aut cumque culpa explicabo aliquid at
perspiciatis est et voluptatem dignissimos dolor itaque sit nam
Title: laboriosam dolor voluptates, Body: doloremque ex facilis sit
sint culpa
soluta assumenda eligendi non ut eius
sequi ducimus vel quasi
veritatis est dolores
Title: temporibus sit alias delectus eligendi possimus magni, Body:
quo deleniti praesentium dicta non quod
aut est molestias
molestias et officia quis nihil
itaque dolorem quia
Title: at nam consequatur ea labore ea harum, Body: cupiditate quo est
a modi nesciunt soluta
ipsa voluptas error itaque dicta in
autem qui minus magnam et distinctio eum
accusamus ratione error aut

Github: Output: https://github.com/vipul2902/DV_Assignment2