```
from google.colab import drive
import pandas as pd
import numpy as np
import re
import nltk
from nltk.corpus import stopwords
import matplotlib.pyplot as plt
from itertools import combinations
import seaborn as sns

drive.mount("/content/drive")
```

```
Drive already mounted at /content/drive; to attempt to forcibly
remount, call drive.mount("/content/drive", force_remount=True).
```

```
nltk.download('stopwords')
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

```
True
```

```
stop_words = set(stopwords.words("english"))

extra_words = {
    "years", "old", "height", "meter", "kg", "cm", "color", "eye",
"hair",
    "male", "female", "working", "job", "govt", "assistant",
"professor",
    "true", "false", "children", "brown", "black", "white", "pale",
"dark",
    "student", "person", "occupation", "weight", "actor", "leo",
"english",
    "telugu", "japanese", "american", "native", "language", "study"
}

file_path = "/content/drive/MyDrive/Course Work/Sem 4/Data Analysis
and Visualization/Lab 6/Person_Data.xlsx"

df = pd.read_excel(file_path, sheet_name="Sheet1")

df
```

```
{"type":"dataframe","variable_name":"df"}
```

```
data = df.iloc[:, 1:]

data
```

```
{"summary":"{\n  \"name\": \"data\",\n  \"rows\": 49,\n  \"fields\":
[\n    {\n      \"column\": \"Person\",\n      \"properties\": {\n
\"dtype\": \"string\",\n        \"num_unique_values\": 46,\n
```

```
\"samples\": [\n          \"Sashank\",\n          \"Priyanshu\",\n
\"AK\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Attributes\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 41,\n        \"samples\":
[\n          \"Beautiful\",\n          \"43 Years\",\n          \"6
feet\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 3\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 43,\n        \"samples\":
[\n          \"happy\",\n          \"white skin\",\n
\"beutiful\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 4\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 43,\n        \"samples\":
[\n          \"artistic\",\n          \"big face\",\n          \"good
dressing\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 5\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 43,\n        \"samples\":
[\n          \"brown\",\n          \"lazy\",\n          \"humour\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Unnamed: 6\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 40,\n        \"samples\": [\n
\"mischievious\",\n          \"Chill\",\n          \"Helpful\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Unnamed: 7\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 37,\n        \"samples\": [\n          \"always
panics\",\n          \"Kind\",\n          \"Sportsman\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"Unnamed: 8\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 33,\n        \"samples\": [\n
\"leo\",\n          \"big eyes\",\n          \"disciplined\"\
n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 9\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 29,\n        \"samples\":
[\n          \"white\",\n          \"girl\",\n          \"Eye Color:
Black\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 10\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 20,\n
\"samples\": [\n          \"Courageous\",\n          \"shy\",\n
\"eye glasses\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 11\",\n      \"properties\": {\n        \"dtype\":
```

\"category\",\n   \"num_unique_values\": 15,\n
\"samples\": [\n   \"strong\",\n   \"mental\",\n
\"Caring\"\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"Unnamed: 12\",\n   \"properties\": {\n   \"dtype\":
\"category\",\n   \"num_unique_values\": 14,\n
\"samples\": [\n   \"motivator\",\n   \"natural\",\n
\"Emotionaally Distant\"\n   ],\n   \"semantic_type\":
\"\",\n   \"description\": \"\"\n   }\n   },\n   {\n
\"column\": \"Unnamed: 13\",\n   \"properties\": {\n
\"dtype\": \"category\",\n   \"num_unique_values\": 9,\n
\"samples\": [\n   \"inspiring\",\n   \"simple\",\n
\"sport\"\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"Unnamed: 14\",\n   \"properties\": {\n   \"dtype\":
\"category\",\n   \"num_unique_values\": 8,\n   \"samples\":
[\n   \"relational\",\n   \"sketcher\",\n
\"Caring\"\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"Unnamed: 15\",\n   \"properties\": {\n   \"dtype\":
\"category\",\n   \"num_unique_values\": 5,\n   \"samples\":
[\n   \"Hair Type: Silky\",\n   \"friend\",\n
\"foodie\"\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"Unnamed: 16\",\n   \"properties\": {\n   \"dtype\":
\"category\",\n   \"num_unique_values\": 2,\n   \"samples\":
[\n   \"cry often\",\n   \"Skin Type: Dry\"\n   ],\
n   \"semantic_type\": \"\",\n   \"description\": \"\"\n
}\n   },\n   {\n   \"column\": \"Unnamed: 17\",\n
\"properties\": {\n   \"dtype\": \"category\",\n
\"num_unique_values\": 2,\n   \"samples\": [\n
\"pretty\",\n   \"Fav Color: Yellow\"\n   ],\n
\"semantic_type\": \"\",\n   \"description\": \"\"\n   }\
n   },\n   {\n   \"column\": \"Unnamed: 18\",\n
\"properties\": {\n   \"dtype\": \"category\",\n
\"num_unique_values\": 1,\n   \"samples\": [\n   \"Fav
Food: Upma\"\n   ],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"Unnamed: 19\",\n   \"properties\": {\n   \"dtype\":
\"number\",\n   \"std\": null,\n   \"min\": null,\n
\"max\": null,\n   \"num_unique_values\": 0,\n
\"samples\": [],\n   \"semantic_type\": \"\",\n
\"description\": \"\"\n   }\n   },\n   {\n   \"column\":
\"Unnamed: 20\",\n   \"properties\": {\n   \"dtype\":
\"category\",\n   \"num_unique_values\": 1,\n   \"samples\":
[],\n   \"semantic_type\": \"\",\n   \"description\": \"\"\n
}\n   }\n]\n}","type":"dataframe","variable_name":"data"}

```
data.drop([16],axis=0,inplace=True)
```

```
data.reset_index(drop=True, inplace=True)

data
```


```
{"summary":"{\n  \"name\": \"data\",\n  \"rows\": 48,\n  \"fields\":
[\n    {\n      \"column\": \"Person\",\n      \"properties\": {\n
\"dtype\": \"string\",\n        \"num_unique_values\": 46,\n
\"samples\": [\n          \"Sashank\",\n          \"Priyanshu\",\n
\"AK\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Attributes\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 41,\n        \"samples\":
[\n          \"Beautiful\",\n          \"43 Years\",\n          \"6
feet\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 3\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 43,\n        \"samples\":
[\n          \"happy\",\n          \"white skin\",\n
\"beutiful\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 4\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 43,\n        \"samples\":
[\n          \"artistic\",\n          \"big face\",\n          \"good
dressing\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 5\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 43,\n        \"samples\":
[\n          \"brown\",\n          \"lazy\",\n          \"humour\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Unnamed: 6\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 40,\n        \"samples\": [\n
\"mischievious\",\n          \"Chill\",\n          \"Helpful\"\n
],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Unnamed: 7\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 37,\n        \"samples\": [\n          \"always
panics\",\n          \"Kind\",\n          \"Sportsman\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"Unnamed: 8\",\n
\"properties\": {\n        \"dtype\": \"string\",\n
\"num_unique_values\": 33,\n        \"samples\": [\n
\"leo\",\n          \"big eyes\",\n          \"disciplined\"\
n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 9\",\n      \"properties\": {\n        \"dtype\":
\"string\",\n        \"num_unique_values\": 29,\n        \"samples\":
[\n          \"white\",\n          \"girl\",\n          \"Eye Color:
Black\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
```

```
\"Unnamed: 10\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 20,\n
\"samples\": [\n          \"Courageous\",\n          \"shy\",\n
\"eye glasses\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 11\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 15,\n
\"samples\": [\n          \"strong\",\n          \"mental\",\n
\"Caring\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 12\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 14,\n
\"samples\": [\n          \"motivator\",\n          \"natural\",\n
\"Emotionaally Distant\"\n        ],\n        \"semantic_type\":
\"\",\n        \"description\": \"\"\n      }\n    },\n    {\n
\"column\": \"Unnamed: 13\",\n      \"properties\": {\n
\"dtype\": \"category\",\n        \"num_unique_values\": 9,\n
\"samples\": [\n          \"inspiring\",\n          \"simple\",\n
\"sport\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 14\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 8,\n        \"samples\":
[\n          \"relational\",\n          \"sketcher\",\n
\"Caring\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 15\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 5,\n        \"samples\":
[\n          \"Hair Type: Silky\",\n          \"friend\",\n
\"foodie\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 16\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 2,\n        \"samples\":
[\n          \"cry often\",\n          \"Skin Type: Dry\"\n        ],\
n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Unnamed: 17\",\n
\"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 2,\n        \"samples\": [\n
\"pretty\",\n          \"Fav Color: Yellow\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"Unnamed: 18\",\n
\"properties\": {\n        \"dtype\": \"category\",\n
\"num_unique_values\": 1,\n        \"samples\": [\n          \"Fav
Food: Upma\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
\"Unnamed: 19\",\n      \"properties\": {\n        \"dtype\":
\"number\",\n        \"std\": null,\n        \"min\": null,\n
\"max\": null,\n        \"num_unique_values\": 0,\n
\"samples\": [],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
```

```
\"Unnamed: 20\",\n      \"properties\": {\n        \"dtype\":
\"category\",\n        \"num_unique_values\": 1,\n        \"samples\":
[],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    }\n  ]\n}","type":"dataframe","variable_name":"data"}
```

```
def preprocess_attributes(attributes):
    cleaned_attributes = set()
    for attr in attributes:
        if isinstance(attr, str):  # Ensure it's a valid string
            attr = attr.lower().strip()  # Convert to lowercase and
strip spaces
            attr = re.sub(r'[^a-zA-Z ]+', '', attr)  # Remove numbers
and special characters
            words = attr.split()
            filtered_words = [word for word in words if word not in
stop_words and word not in extra_words]
            if filtered_words:
                cleaned_attributes.add(" ".join(filtered_words))  #
Reconstruct phrase

    return cleaned_attributes

def create_person_attribute_dict(df):
    person_dict = {}

    for _, row in df.iterrows():
        person = row.iloc[0]  # First element is the name
        attributes = row.iloc[1:].dropna().tolist()  # Drop NaN values
and get attributes
        person_dict[person] = preprocess_attributes(attributes)

    return person_dict

def jaccard_distance(set1, set2):
    intersection = len(set1 & set2)
    union = len(set1 | set2)
    return 1 - (intersection / union) if union != 0 else 1

def compute_pairwise_distances(person_dict):
  persons = list(person_dict.keys())
  distances = []
  for p1, p2 in combinations(persons, 2):
    distance = jaccard_distance(person_dict[p1], person_dict[p2])
    distances.append(distance)
  return distances

def compute_percentage_of_pairs(thresholds, distances):
  percentages = []
  for threshold in thresholds:
    count = sum(1 for d in distances if d <= threshold)
    percentage = (count / len(distances)) * 100
```

```
    percentages.append(percentage)
  return percentages

def plot_linear_plot(x, y, x_label, y_label, title):
  plt.plot(x, y, marker='o')
  plt.xlabel(x_label)
  plt.ylabel(y_label)
  plt.title(title)
  plt.grid(True)
  plt.show()

person_attribute_dict = create_person_attribute_dict(data)

person_attribute_dict
```

```
{'A': {'ambitions',
  'caring',
  'courageous',
  'emotionaally distant',
  'funny',
  'hard',
  'intellegent',
  'kind',
  'mature',
  'short tempered',
  'understanding'},
 'Dad': {'caring',
  'emotion less',
  'hard',
  'holy',
  'honest',
  'loyal',
  'progressive mind',
  'self confidance',
  'trustwarthy'},
 'Mother': {'beautiful',
  'best cook',
  'caring',
  'emotional',
  'hard',
  'helping',
  'loving',
  'short',
  'short tempered',
  'strong'},
 'Rohit': {'casual',
  'helpful',
  'humorous',
  'low marks',
  'makes fun everyone',
```

```
  'professional',
  'shortcut',
  'standup comedian'},
 'B': {'caring',
  'funny',
  'handsome',
  'honest',
  'intelligent',
  'kind',
  'loyal',
  'rich',
  'romantic',
  'slim',
  'sportsman',
  'voilent',
  'writer'},
 'Pratyush Kumar': {'funny', 'hero', 'short', 'tempered', 'thin'},
 'C': {'agrees everything',
  'compromising',
  'emotions',
  'funny',
  'good memory',
  'helping',
  'reasonable',
  'relational',
  'rich',
  'selfless',
  'simple',
  'smart',
  'supportive',
  'understanding'},
 'D ': {'caring',
  'foodie',
  'helping nature',
  'ignorance',
  'reader',
  'short tempered'},
 'Suresh': {'awareness', 'geedy new thing', 'overcomig failure',
'socialist'},
 'Sreekar': {'fav mov inception',
  'feet',
  'likes cricket',
  'likes movies',
  'reader',
  'skill play keyboard',
  'vijaywada ap'},
 'E': {'arogent',
  'beautiful',
  'disciplined',
```

```
  'early riser',
  'emotional',
  'feet',
  'listen song'},
 'Akash': {'engineering', 'lang telgu', 'slim'},
 'F': {'age',
  'atheletic figure',
  'basketball player',
  'calm composed',
  'feet',
  'highly competetive',
  'sarcastic'},
 'Anil': {'age',
  'feet',
  'food biryani',
  'hobbies football comics',
  'movies songs',
  'skill computer',
  'skin'},
 'B Vijaya Laxmi': {'emp', 'feet', 'kind', 'loving'},
 'H': {'asstt',
  'bindi',
  'earring',
  'fav food upma',
  'fav yellow',
  'glasses',
  'h',
  'married',
  'skin type dry',
  'skintone',
  'type silky'},
 'AA': {'arrogant', 'helpful', 'hyper', 'overconfident', 'short
temper'},
 'AB': {'bad sports',
  'chill',
  'communication',
  'effortless',
  'highly intelligent',
  'intriguing',
  'lazy'},
 'MANOPRIYA': {'caring',
  'childish',
  'creative',
  'cute',
  'handwriting',
  'intelligent',
  'pretty eyes',
  'thoughtful'},
 'AD': {'always panics',
```

```
  'big eyes',
  'caring',
  'curly',
  'emotional',
  'friendly',
  'funny',
  'hardworking',
  'loving',
  'multitasking',
  'shorter',
  'smart'},
 'AE': {'caring',
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  'cry often',
  'cute',
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  'girl',
  'happy',
  'intelligent',
  'loving',
  'mischievious',
  'naughty',
  'painter',
  'pretty',
  'sister',
  'small',
  'sweet'},
 'AF': {'confident', 'humour', 'kind', 'lame', 'lovable', 'short',
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 'Sudeshna': {'bold',
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  'confident',
  'eyes',
  'fair',
  'mature',
  'movies',
  'short'},
 'AH': {'funny', 'good character', 'kind', 'teddy bear'},
 'Nikhil': {'animal lover',
  'anime',
  'artistic',
  'drive',
  'fair',
  'introvert',
  'shy',
  'sleepy',
  'sports',
  'thin',
```

```
 'video game'},
'Priyanshu': {'badminton',
 'big face',
 'cricket',
 'driver',
 'fast thinking',
 'helping nature',
 'introvert',
 'lazy',
 'singing',
 'skin',
 'small',
 'sport',
 'weak communication'},
'AK': {'beutiful',
 'decision making',
 'emotional',
 'fearless',
 'good cook',
 'good dressing',
 'hairstylist',
 'humour',
 'intelligent',
 'introvert',
 'knowledge',
 'singer',
 'sketcher',
 'strong'},
'Radhika': {'beautiful',
 'best cook',
 'caring',
 'friend',
 'hardworking',
 'helping',
 'inspiring',
 'loving',
 'motivator',
 'patience',
 'sacrifice',
 'strength',
 'strong',
 'support'},
'Sachin Tendulkar': {'famous', 'fast', 'legendary', 'short'},
'Elon musk': {'business',
 'innovative',
 'multi billonaire',
 'space exploration'},
'Prashant': {'athletic',
 'bhajan',
```

```
  'flute',
  'honest',
  'lazy',
  'polite',
  'sleepy'},
 'Purna': {'newspaper', 'overthinker', 'puntual', 'teacher'},
 'Varun': {'determined',
  'disciplined',
  'glasses',
  'gym',
  'hard',
  'ignorant',
  'jolly',
  'kind',
  'orthodox',
  'physicque',
  'serious'},
 'Saket': {'attractive',
  'bold',
  'calm',
  'consistent',
  'destructive',
  'fit',
  'hard',
  'hypertrophy',
  'mental',
  'natural',
  'non controversial',
  'socially dead',
  'strong'},
 'Mr More': {'confident',
  'disciplined',
  'hardworking',
  'helping',
  'honest',
  'humble',
  'strict',
  'tall'},
 'Divyansh': {'conservative', 'disciplined', 'helpful', 'introvert'},
 'SVS Rohit': {'calm',
  'disciplined',
  'hardworking',
  'honest',
  'humble',
  'kind',
  'tall'},
 'Euchiro Oda': {'animated show',
  'manga comic',
  'netflix',
```

```
  'pirate',
  'story writer'},
 'Sudarshan': {'good character', 'workout'},
 'Sashank': {'cool',
  'enjoyable',
  'hardworking',
  'humour',
  'non vegetarian',
  'social'},
 'venkat': {'cool',
  'happy',
  'hardworking',
  'humour',
  'non vegetarian',
  'social'},
 'Theophila': {'coder', 'friendly', 'piano', 'reading', 'singer',
'writing'},
 'Saurav': {'bargaining',
  'best friend',
  'bulky body',
  'caring',
  'cricket',
  'expressive',
  'funny',
  'gentle',
  'gym',
  'table tennis',
  'traveling'},
 'AL': {'englandactor'},
 'Kesav1': {'badminton',
  'consistent',
  'cricket',
  'joyful',
  'short tempered',
  'space enthusiast',
  'tallest'},
 'Kesav2': {'friendly', 'vizag'}}

distances = compute_pairwise_distances(person_attribute_dict)

distances

[0.8888888888888888,
 0.8333333333333334,
 1.0,
 0.8571428571428572,
 0.9333333333333333,
 0.9130434782608696,
 0.8666666666666667,
 1.0,
```

```
1.0,
1.0,
1.0,
1.0,
1.0,
0.9285714285714286,
1.0,
1.0,
1.0,
0.9444444444444444,
0.9047619047619048,
0.9615384615384616,
0.9411764705882353,
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thresholds = np.arange(0, 1.05, 0.05)

percentages = compute_percentage_of_pairs(thresholds, distances)

x = thresholds
y = percentages
x_label = 'Jaccard Distance Threshold'
y_label = 'Percentage of Pairs Within Threshold (%)'
title = 'Percentage of Pairs Within Jaccard Distance'

plot_linear_plot(x, y, x_label, y_label, title)
```
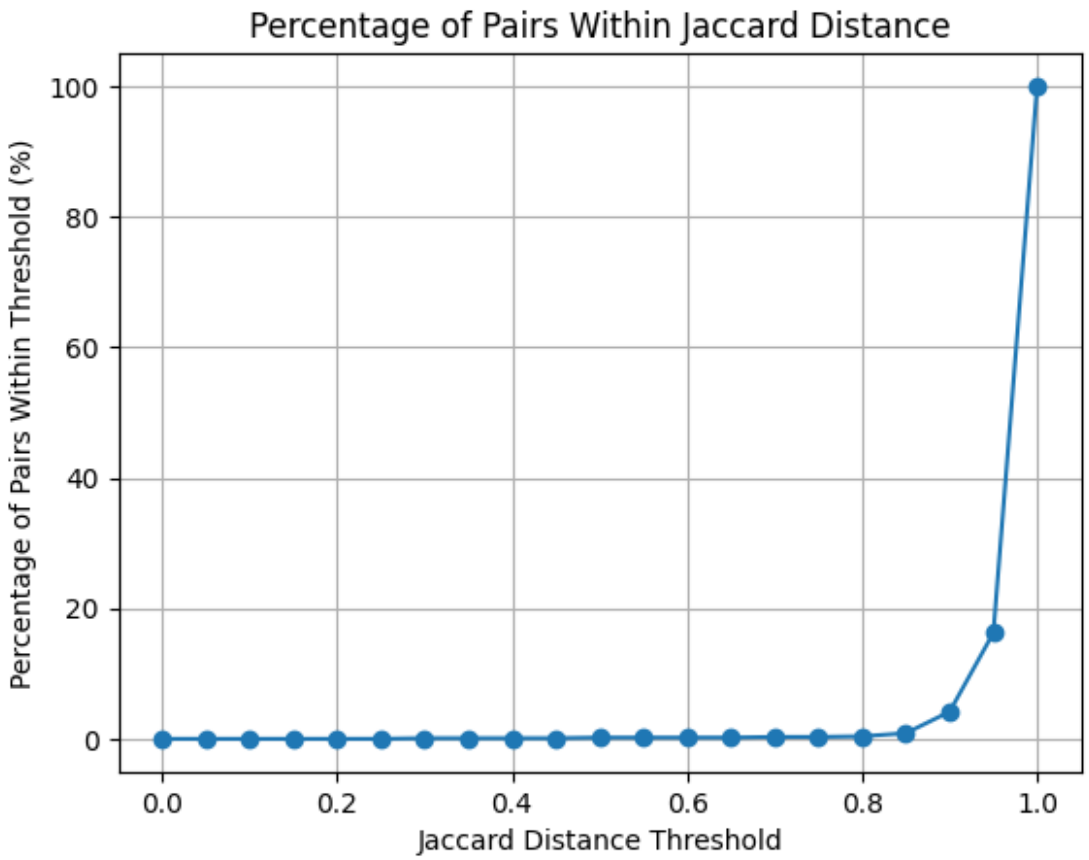
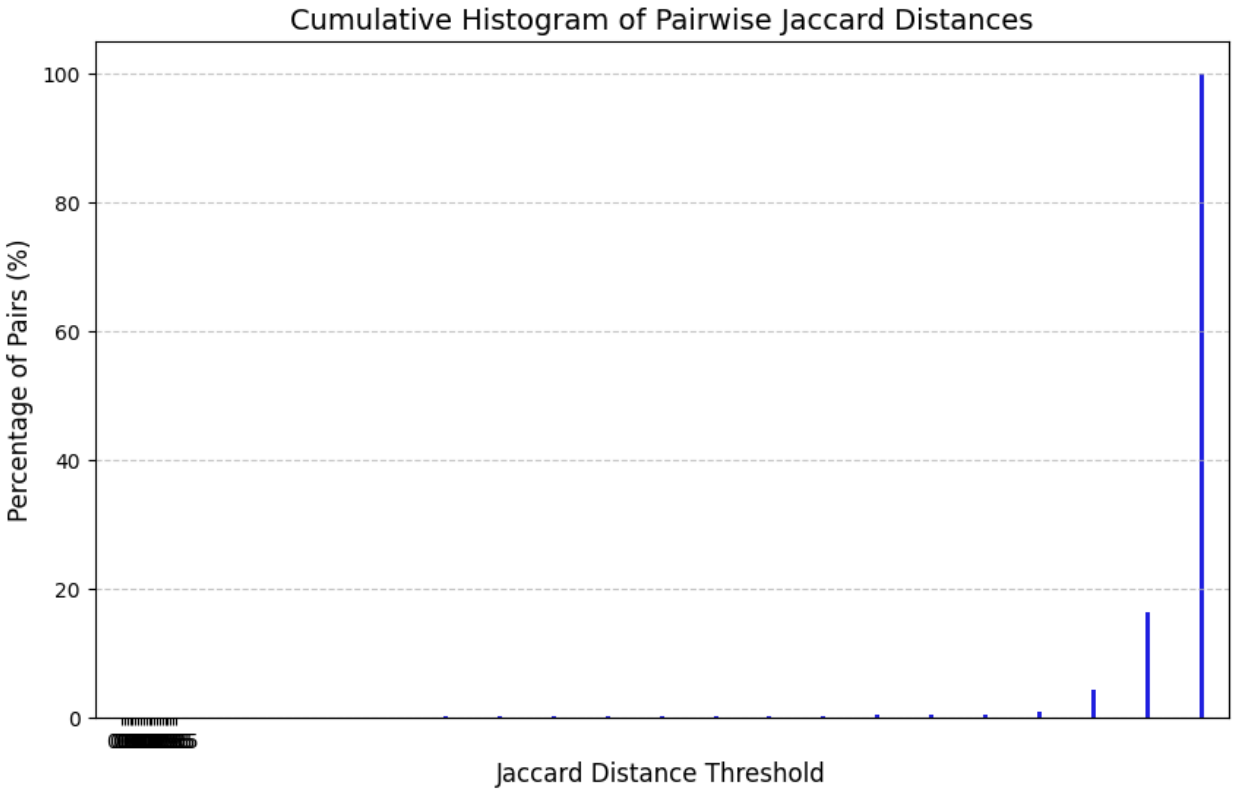




```
plt.figure(figsize=(10, 6))
sns.barplot(x=thresholds, y=percentages, color="blue", width=0.08)

# Labels and Titles
plt.xlabel("Jaccard Distance Threshold", fontsize=12)
plt.ylabel("Percentage of Pairs (%)", fontsize=12)
plt.title("Cumulative Histogram of Pairwise Jaccard Distances",
fontsize=14)
plt.xticks(thresholds)  # Ensure all bins are labeled
plt.grid(axis="y", linestyle="--", alpha=0.7)

# Show plot
plt.show()
```


Cumulative Histogram of Pairwise Jaccard Distances
Percentage of Pairs (%)
100
80
60
40
20
0
Jaccard Distance Threshold