DATA SCIENCE PROJECT

Data Science for Scopus Dataset

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DIAGRAM

Raw Data

+

ELSEVIER Scopus

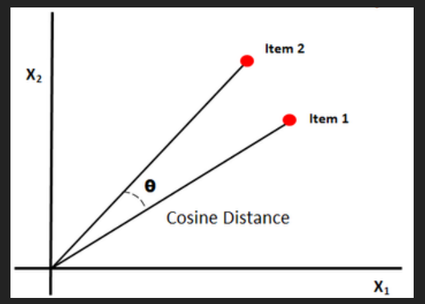
Scrape Data

APACHE Spark

pandas

CSV

all-MiniLM-L6-v2



cosine-similarity

semantic search

Streamlit

Data Extraction **Data Preprocessing** **Data Science** **Data Visualization**

DATA

- language
- title
- abstract
- authors
- keywords
- published_date
- subject_code
- citedby_count
- publisher

DATA

Raw data

(2018 - 2023)

+

ELSEVIER

Scopus

Scrape Data from Scopus API

(2011 - 2017)

DATA PREPROCESSING

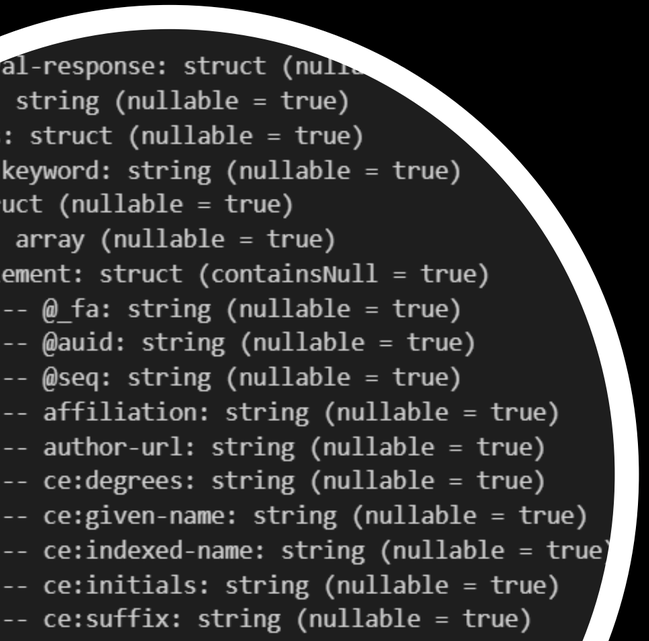
Web Scraping

Understanding Data

Clean Data

Query

See details



WEB SCRAPING

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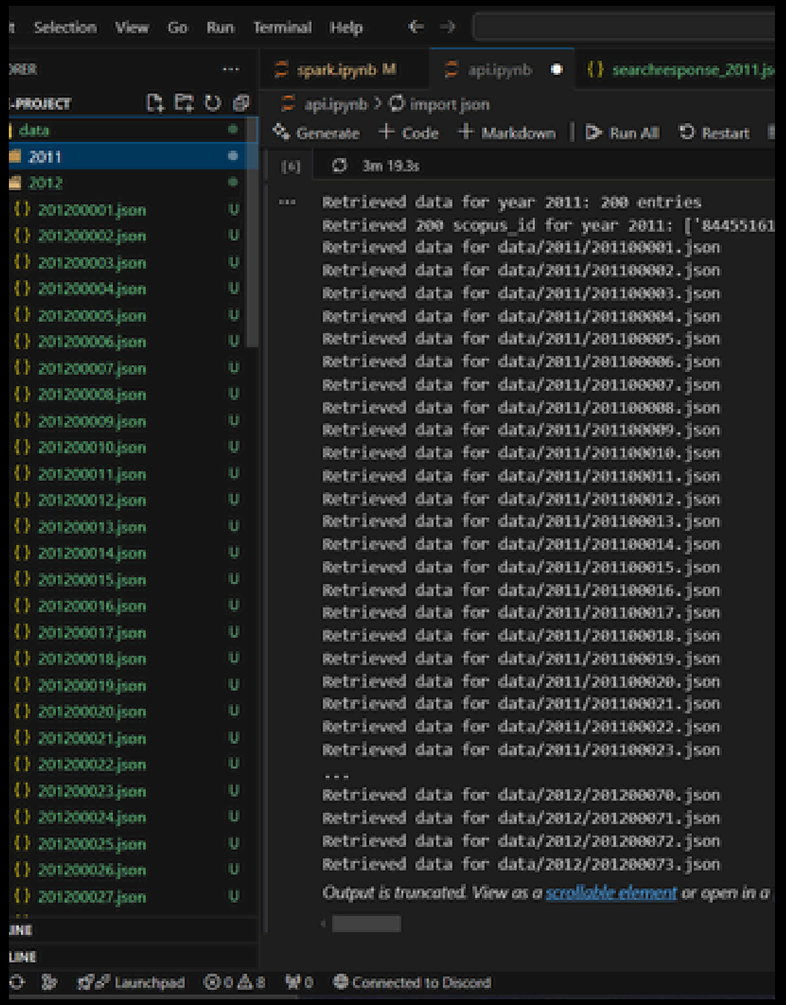


ELSEVIER
Scopus

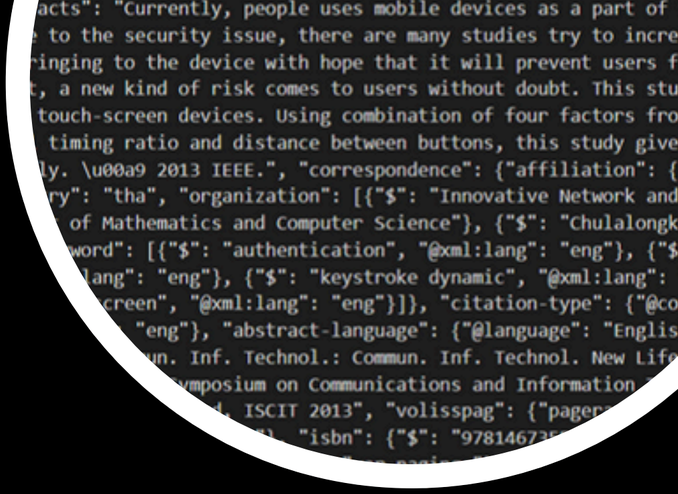
```python
for year in range(2011, 2018):
    url = f"https://api.elsevier.com/content/search/scopus"
    params = {
        "apiKey": "YOUR_API_KEY",
        "insttoken": "YOUR_INST_TOKEN",
        "httpAccept": "application/json",
        "query": f"PUBYEAR = {year} AND AFFILORG('Chulalongkorn University')",
        "count": 200
    }

    response = requests.get(url, params=params)

    if response.status_code == 200:
        try:
            data = response.json()
            print(f"Retrieved data for year {year}: {len(data.get('search-results', {}).get('
            documentIndexes = []
            with open(f'searchresponse_{year}.json', 'w') as f:
```

UNDERSTANDING DATA

```
root
 |-- abstracts-retrieval-response: struct (nullable = true)
 |    |-- affiliation: string (nullable = true)
 |    |-- authkeywords: struct (nullable = true)
 |    |    |-- author-keyword: string (nullable = true)
 |    |-- authors: struct (nullable = true)
 |    |    |-- author: array (nullable = true)
 |    |    |    |-- element: struct (containsNull = true)
 |    |    |    |    |-- @_fa: string (nullable = true)
 |    |    |    |    |-- @auid: string (nullable = true)
 |    |    |    |    |-- @seq: string (nullable = true)
 |    |    |    |    |-- affiliation: string (nullable = true)
 |    |    |    |    |-- author-url: string (nullable = true)
 |    |    |    |    |-- ce:degrees: string (nullable = true)
 |    |    |    |    |-- ce:given-name: string (nullable = true)
 |    |    |    |    |-- ce:indexed-name: string (nullable = true)
 |    |    |    |    |-- ce:initials: string (nullable = true)
 |    |    |    |    |-- ce:suffix: string (nullable = true)
 |    |    |    |    |-- ce:surname: string (nullable = true)
 |    |    |    |    |-- preferred-name: struct (nullable = true)
 |    |    |    |    |    |-- ce:given-name: string (nullable = true)
 |    |    |    |    |    |-- ce:indexed-name: string (nullable = tru
 |    |    |    |    |    |-- ce:initials: string (nullable = true)
 |    |    |    |    |    |-- ce:surname: string (nullable = true)
 |    |-- coredata: struct (nullable = true)
...
 |    |    |    |    |-- @_fa: string (nullable = true)
```



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QUERY DATA

```
export_DF = paperDF.select(
    col("abstracts-retrieval-response.coredata.dc:title").alias("title"),
    col("abstracts-retrieval-response.coredata.dc:description").alias("abstract"),
    col("abstracts-retrieval-response.coredata.dc:creator.author.ce:indexed-name").alias("authors"),
    col("abstracts-retrieval-response.coredata.prism:coverDate").alias("published_date"),
    col("abstracts-retrieval-response.subject-areas.subject-area.@abbrev").alias("subject_code"),
    col("abstracts-retrieval-response.language.@xml:lang").alias("language"),
    col("abstracts-retrieval-response.coredata.citedby-count").alias("citedby_count"),
    col("abstracts-retrieval-response.coredata.dc:publisher").alias("publisher"),
    col("abstracts-retrieval-response.authkeywords.author-keyword").alias("keywords")
)
```

CLEAN DATA

```
# Handle missing values
data_cleaned = data.dropna(subset=['title', 'abstract', 'published_date','subject_codes'])

# Drop rows where 'keywords' column is an empty list
data_cleaned = data_cleaned[data_cleaned['keywords'].apply(lambda x: x != [])]

# Fill missing values in the 'cited' column with 0
data_cleaned['citedby_count'] = data_cleaned['citedby_count'].fillna(0)

# Convert the list in 'authors' column to a tuple to make it hashable
data_cleaned['authors'] = data_cleaned['authors'].apply(tuple)

# Remove duplicate rows based on the title and authors combination, assuming they uniquely identify a document.
data_cleaned = data_cleaned.drop_duplicates(subset=['title', 'authors'])
```

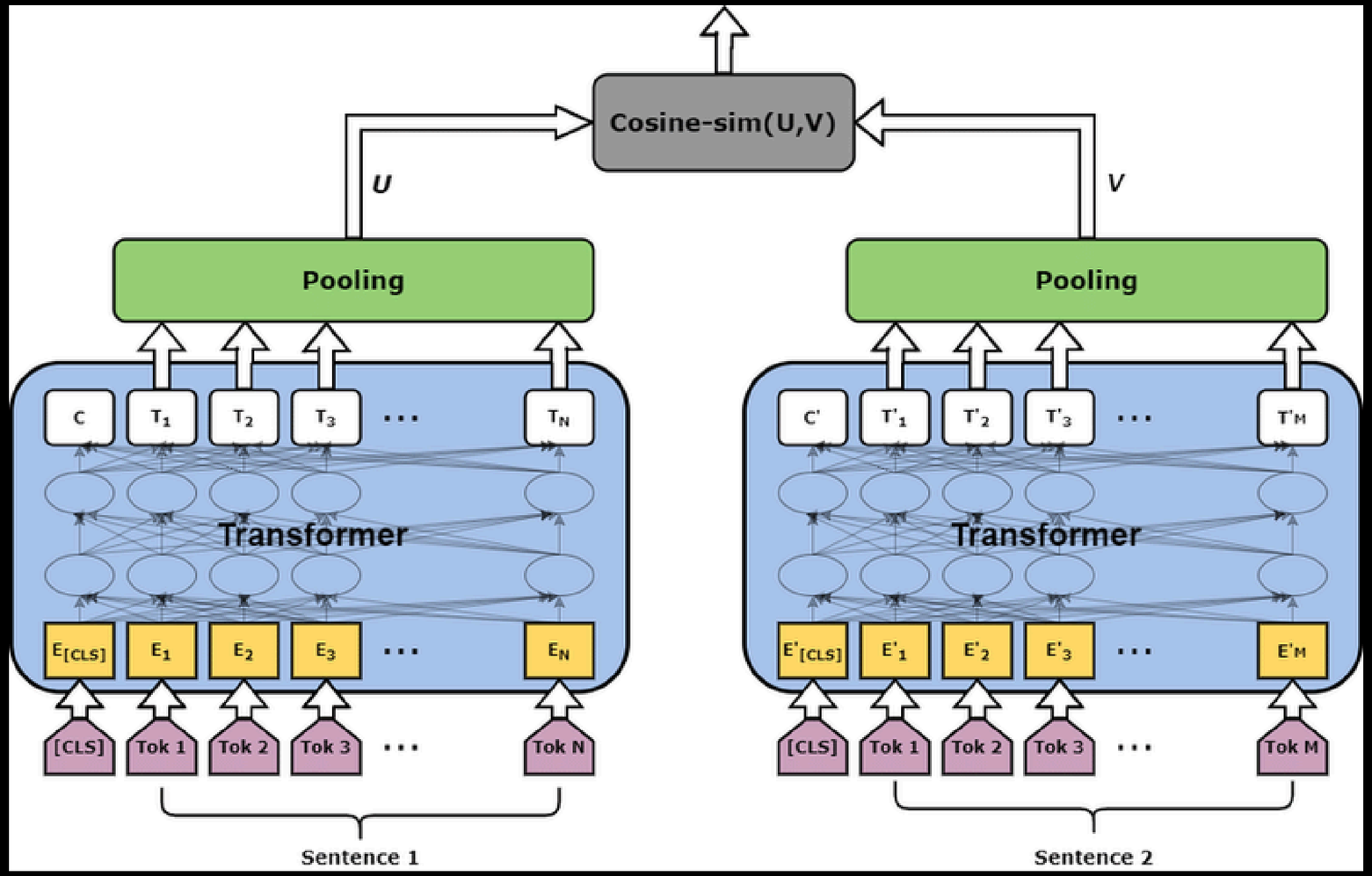
```
def clean_subject_codes(subject_codes):
    # Remove duplicates and join back as a comma-separated string.
    unique_codes = ", ".join(sorted(set(subject_codes)))
    return unique_codes

# Apply the cleaning function to the 'subject_codes' column
data_cleaned['subject_codes'] = data_cleaned['subject_codes'].apply(clean_subject_codes)
```

DATA SCIENCE

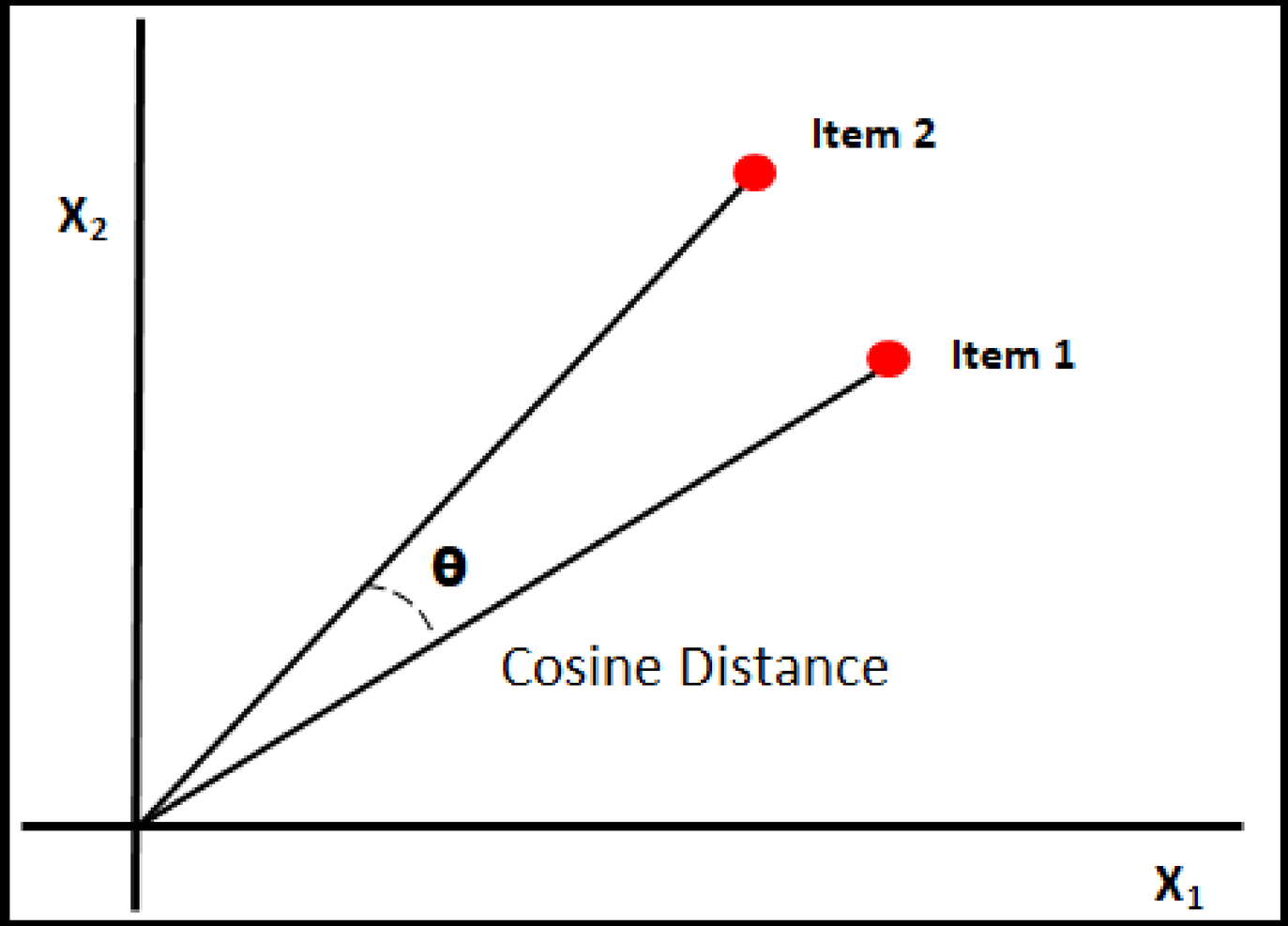
AI/ML

SEMANTIC SEARCH

SENTENCE-TRANSFORMERS

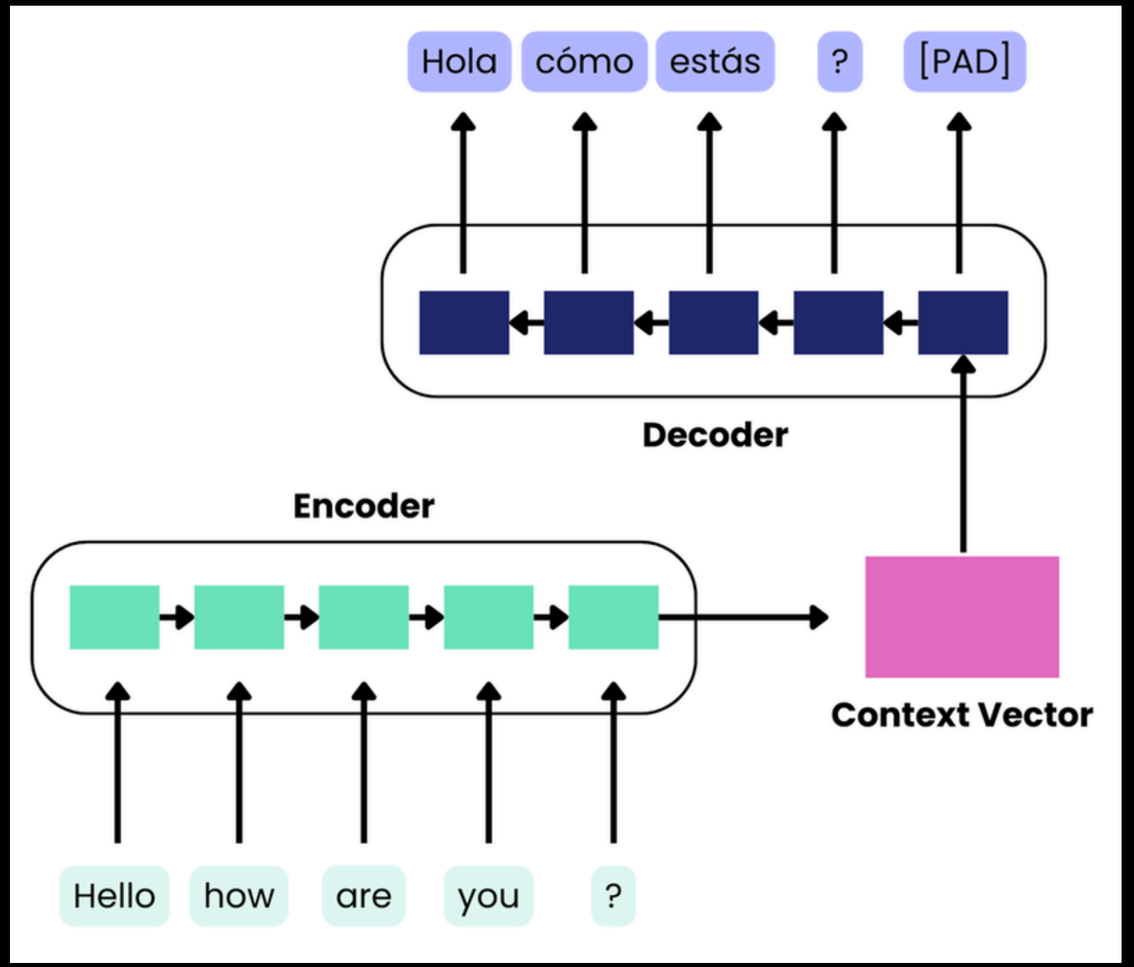


COSINE-SIMILARITY



MODEL

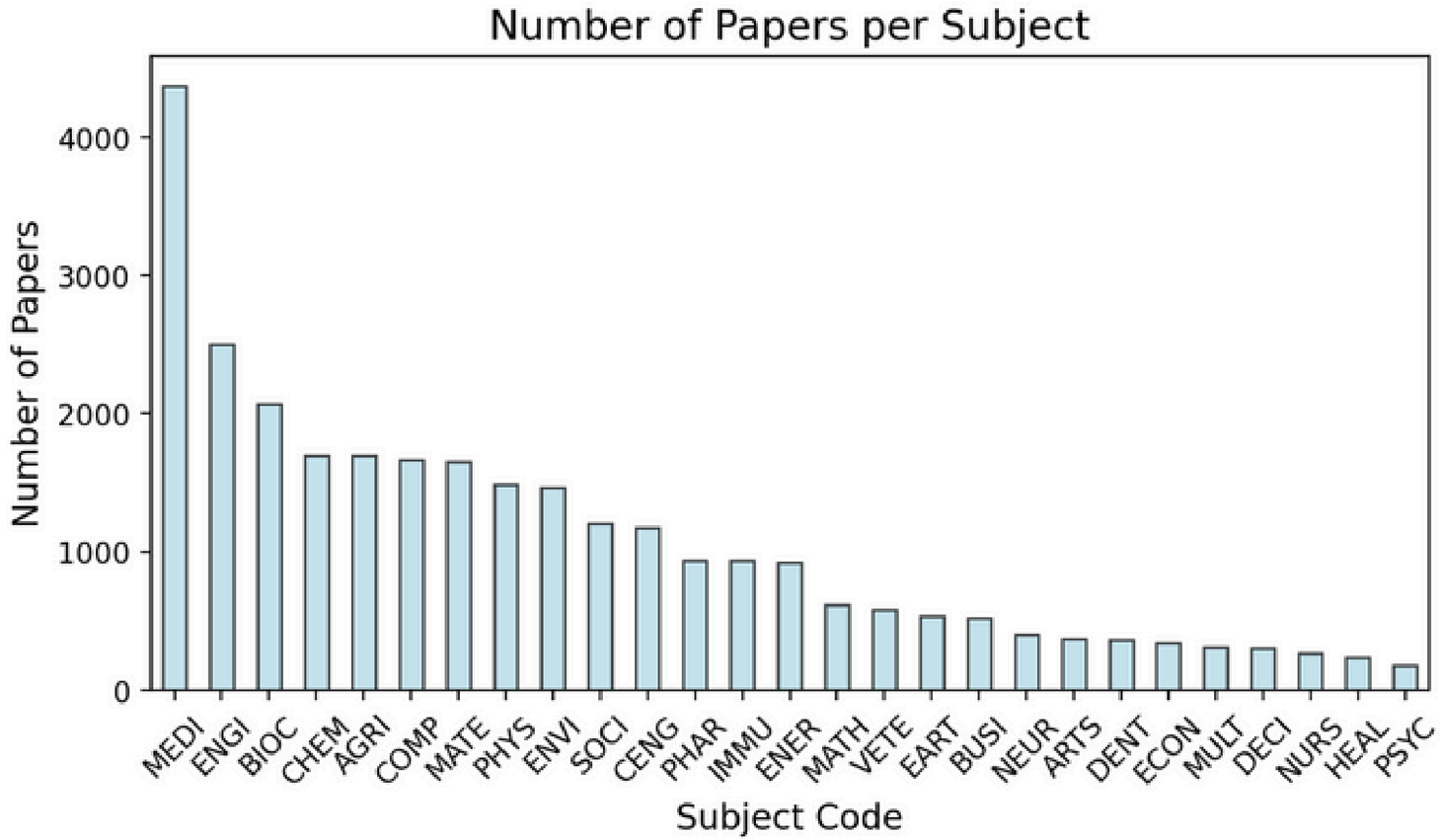
- all-MiniLM-L6-v2



DATA VISUALIZATION

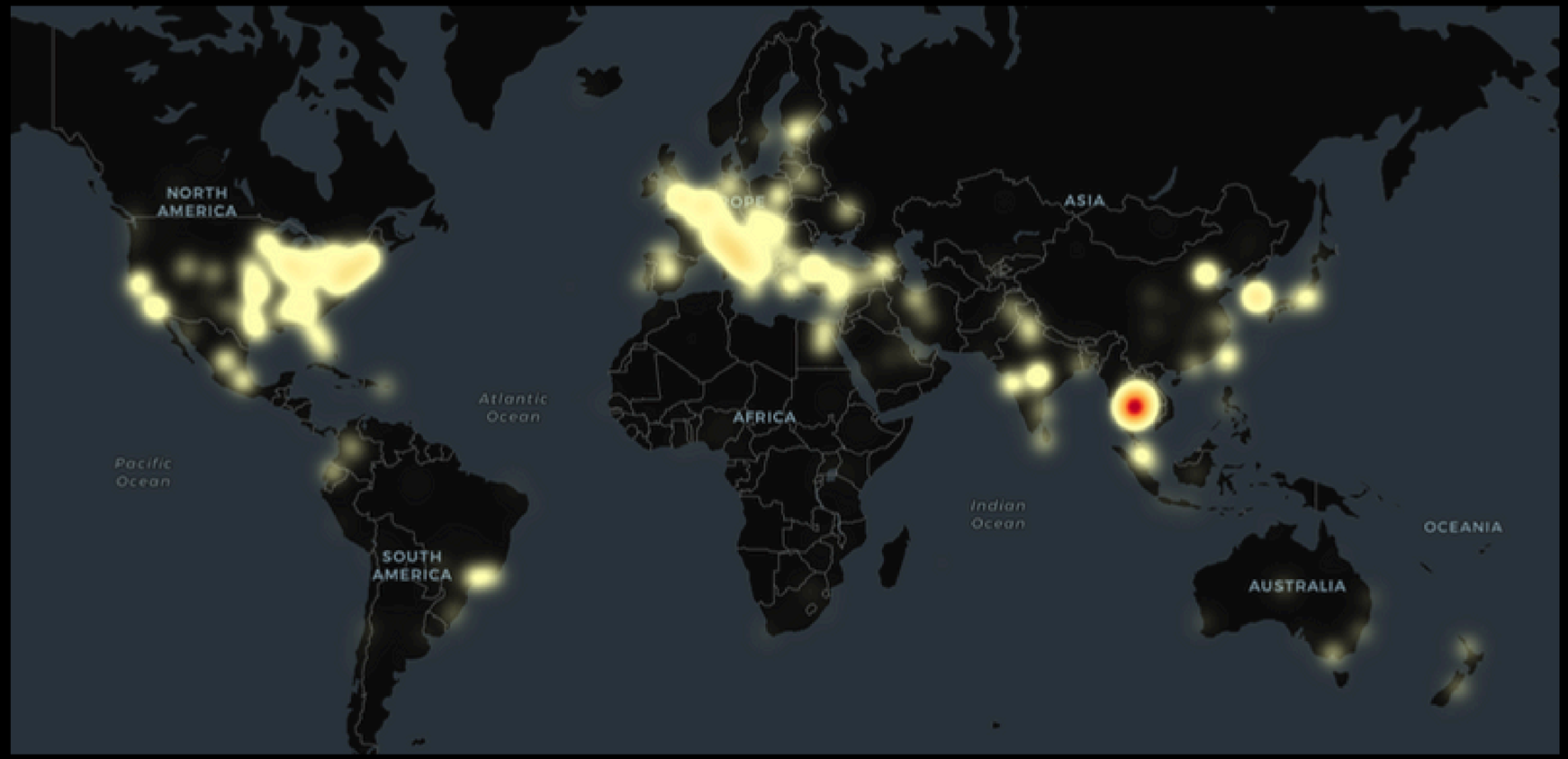
DATA OVERVIEW

Visualization: Papers Per Subject



DATA OVERVIEW

- Heatmap of location of authors



SEARCH...


Search Related Papers
Enter sentence or word:
Search
Select Similarity Percentage:
30
100
0
100
number of papers:
10

DEMO

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Ensuring Data Accuracy and Reliability

IMPORTANCE OF DATA CLEANING

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Read More

CHALLENGES IN DATA ANALYSIS

Overcoming Common Obstacles

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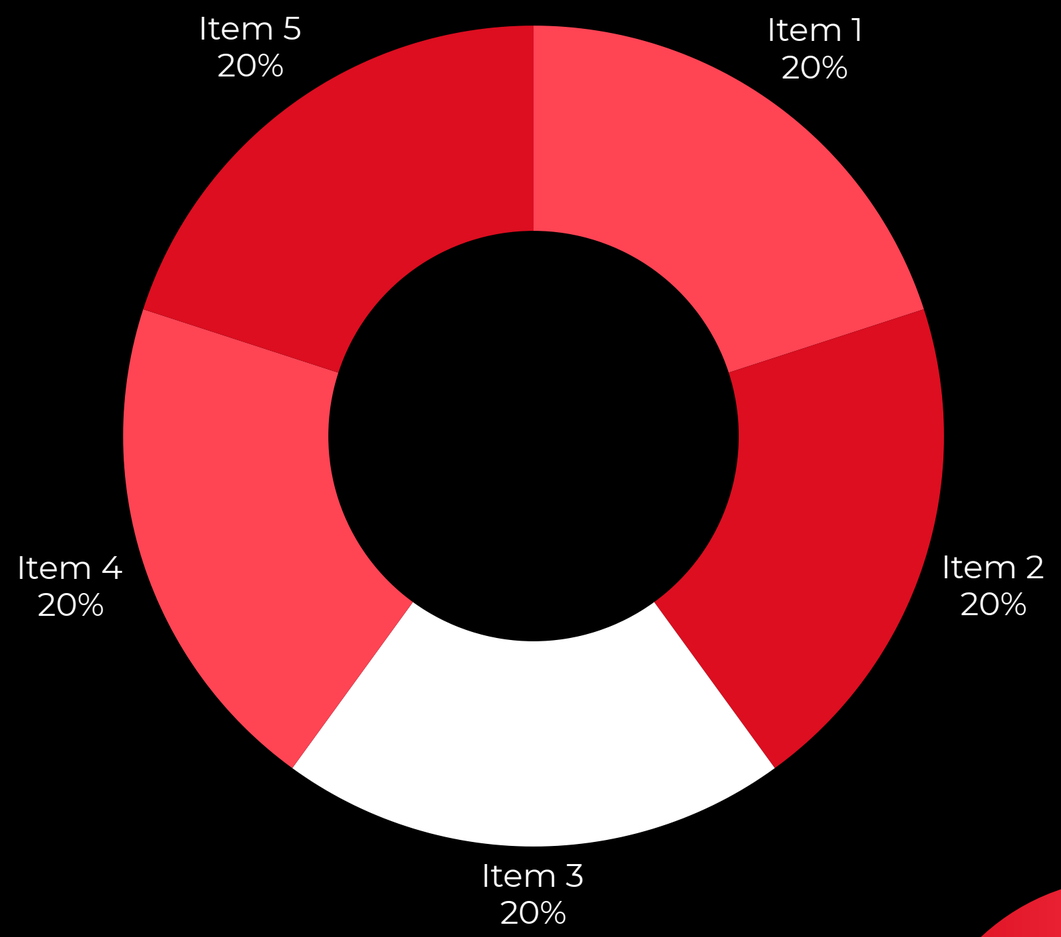

CONCLUSION

The Future of Data Analysis

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THANK YOU

2024 Data Analysis Presentation