National College of Ireland

Configuration Manual

MSc Research Project
Cloud Computing

Vaishnavi Krishnananda Bhat
Student ID: x23110864

School of Computing
National College of Ireland

Supervisor: Yasantha Samarawickrama

National College of Ireland
Project Submission Sheet
School of Computing

National College of Ireland

Student Name:	Vaishnavi Krishnananda Bhat
Student ID:	x23110864
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Date:	12th August 2024

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Configuration Manual

Vaishnavi Krishnananda Bhat
x23110864

1 Introduction

The configuration manual for my research project, titled "Enhancing Cloud Storage Security and Efficiency through Integrated Ranked Keyword Search and Cryptographic Techniques: A Multi-Client Approach," is a guide for setting up and executing the implemented system.

This configuration manual assists users in replicating the implementation in Google Colab. It includes detailed instructions on configuring the system and running keyword searches to obtain relevant search results. It gives insights to generate and analyze key performance and security metrics, which helps in understanding the system's behavior and effectiveness in real-world applications. By following this manual, users can set up the system, perform secure and efficient relevant searches and evaluate the outcomes, which helps in deeper understanding of advanced cloud security solutions.

2 Simulation Setup

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Prerequisites:

- Require an active Google account to access Google Colab.
- CSV file with the documents you want to load for keyword indexing. Each row in the CSV should represent a document.

2.1 To get the implementation code.

- For Windows, Open a terminal and use `Git Bash` (installed with Git) or the Command Prompt/PowerShell. For macOS/Linux, Use the Terminal app.
- Navigate to the directory where you want to clone the repository: `cd /path/to/your/directory`
- Go to the repository on GitHub [1]
- Click on the "Code" or "Clone" button and copy the repository URL. The URL can be in HTTPS or SSH format.
- Use the command:`git clone https://github.com/VaishKBhat/research-project.git`
- Now you have repository and files required.

[1] https://github.com/VaishKBhat/research-project

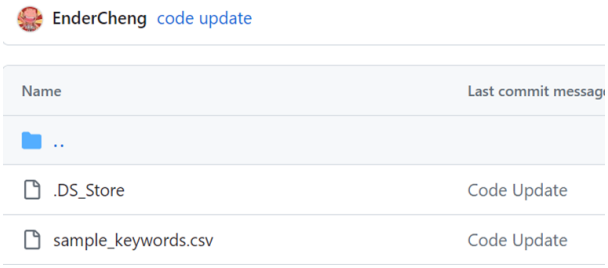

Figure 1: Dataset used in the implementation

2.2 To get the dataset used in the model.

- Clone the code from the github [2]
- The dataset `sample_keywords.csv` is in the file path : KeywordSearch-main\Datasets.

3 Step-by-Step Setup

1. Open Google Colab and create a new notebook (refer Figure 2).

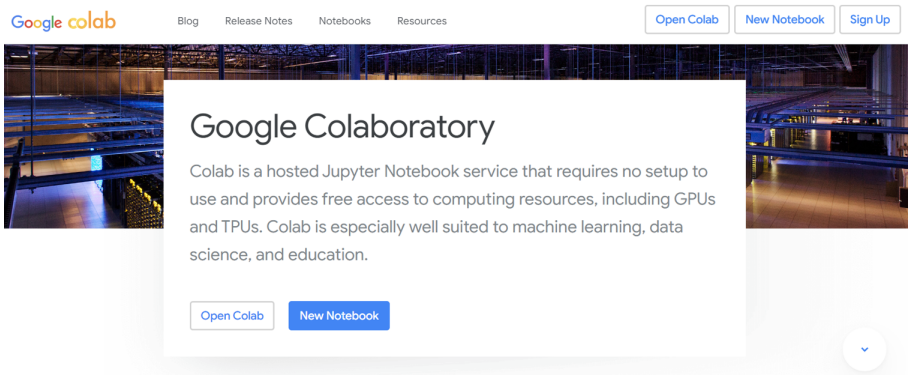

Figure 2: Google Colab

2. Upload the file containing code in the Colab notebook. Click on **File**, **Browse** and **Upload** the notebook (refer Figure 3).
3. After uploading the notebook, Upload the dataset csv file downloaded that contains the keyword documents to Google Colab.
4. Wait till the file gets uploaded correctly (refer Figure 4).
5. Copy the uploaded dataset path(refer Figure 5).

[2]https://github.com/EnderCheng/KeywordSearch

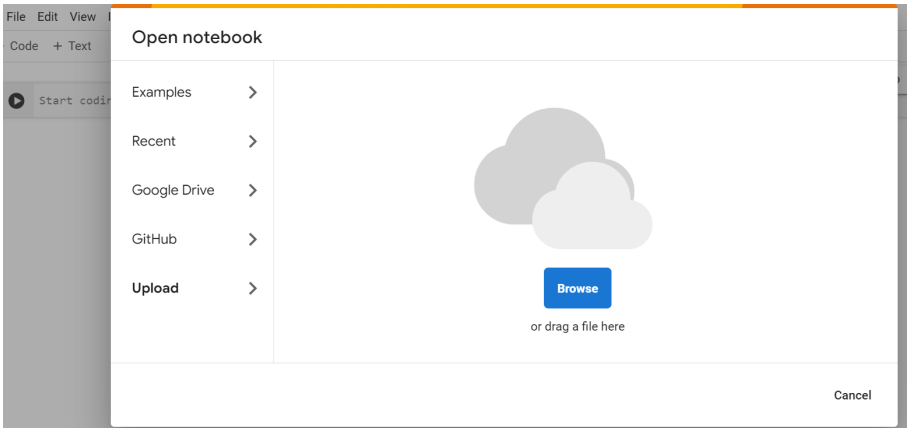

Figure 3: Upload Notebook

Figure 4: uploading of csv file

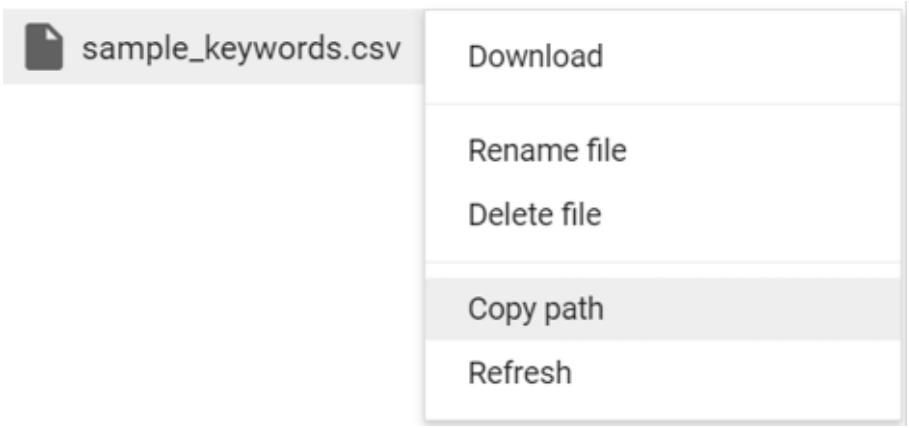

Figure 5: Copy file path

6. Click on the sample_keywords.csv file

   Replace in the code as:
   `csv\_file\_path = '/content/sample_keywords.csv'` # Replace with your uploaded file path (refer Figure 6).

```
# Sample usage
csv_file_path = '/content/sample_keywords.csv'
```

Figure 6: Update file path

7. Change the true positive values for verifying the accuracy if required(refer 7) .

```
# True positive documents (for calculating FPR and FNR)
true_positive_docs = ["doc_227", "doc_3349", "doc_2543","doc_9","doc_10","doc_13","doc_1438","doc_140"]
```

Figure 7: Set True Positive Values

8. Run search function to perform a keyword search and retrieve results. Replace "european" with your desired keyword and provide a list of true positive document IDs for comparison(refer Figure 8).

```
# Perform a search
keyword = "european"
results = secure_search.search(client_id, keyword, true_positive_docs)
```

Figure 8: Change keyword as needed for search

9. After performing the search, you can view various metrics related to the search and indexing process (Figure 9 and Figure 10).

10. Optionally, can save the metrics to a JSON file for further analysis and analyze the ranked search results and security metrics to evaluate the performance of the system.

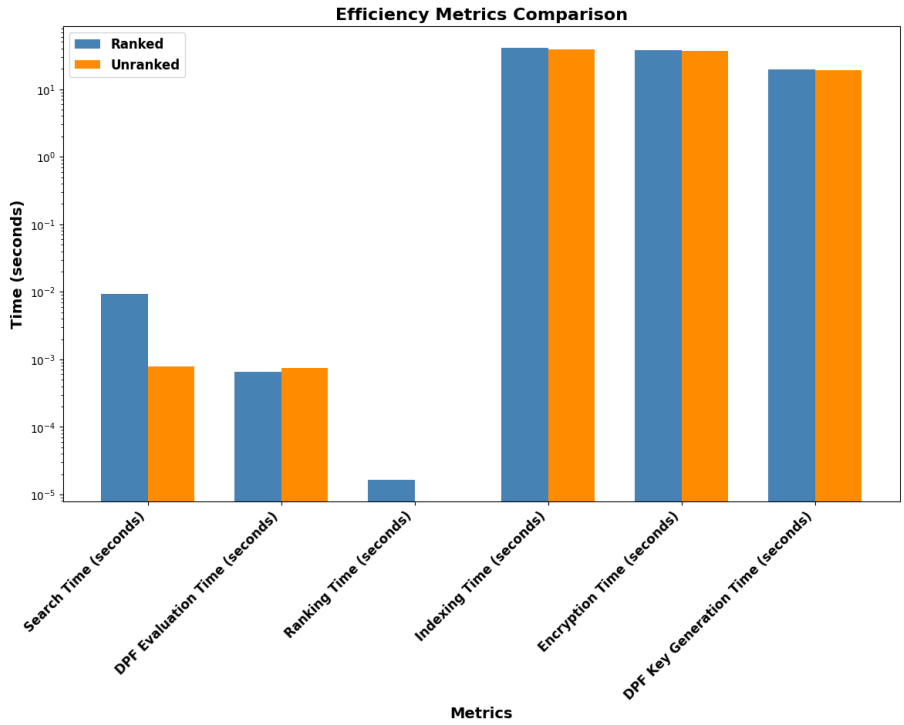

Figure 9: efficiency metrics for keyword-european

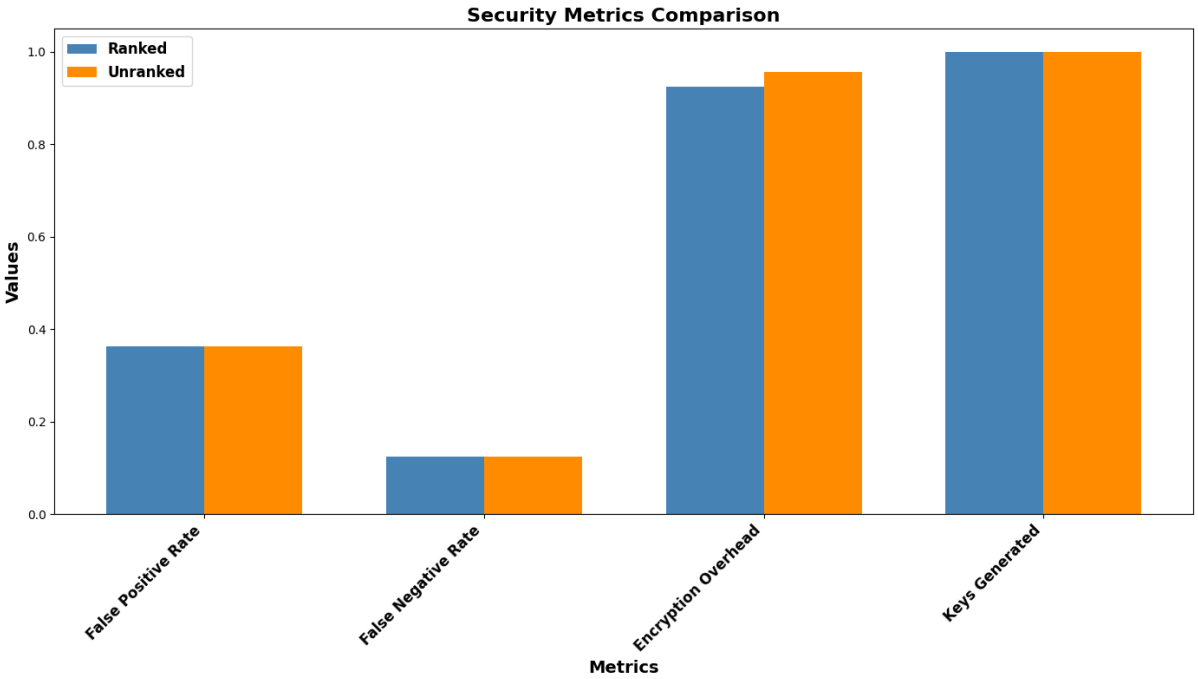

Figure 10: security metrics for keyword - european