How to Run the Application??

Activate the Virtual Environment:

- venv\Scripts\activate

Run the Application:

- streamlit run app.py

Enter a Query:

- Input a query in the text box (e.g., "Test for mid-level engineers with coding skills").

View Recommendations:

- The system displays the top recommendations with details like name, description, test type, job levels, duration, and a link to the assessment.

Export Recommendations:

- Click the "📄 Export to PDF" button to download the recommendations as a PDF.

How to Evaluate the System

Run the Evaluation Script:

- streamlit run app_test.py

Enter a Query:

- Provide a query in the input box such as *Test for front-end developers with JavaScript skills*

View Evaluation Metrics:

- The system calculates and displays:
- Precision@K: Proportion of relevant recommendations in the top K.
- Recall@K: Proportion of relevant documents retrieved in the top K.

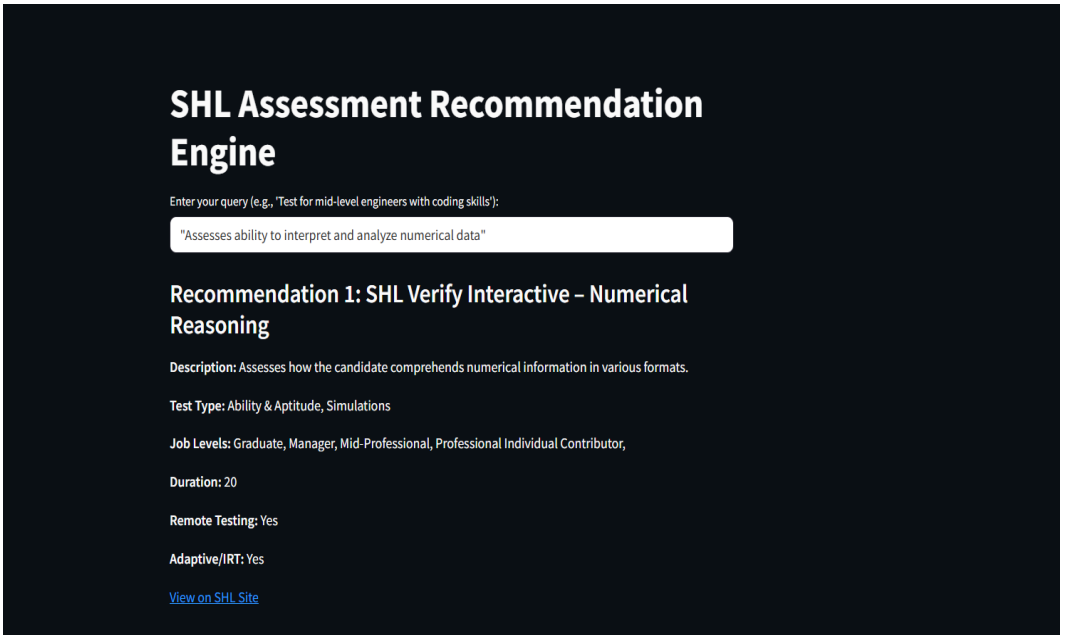
Interpret Metrics:

- Higher Precision@K and Recall@K indicate better performance.

Purpose of app_test.py

- Include the logic for evaluating the recommendation system.
- Display the evaluation metrics (Precision@K and Recall@K) for each query.
- Help analyze the system's performance and identify areas for improvement.

Output -



PDF EXPORT-

Recommendation 1: SHL Verify Interactive – Numerical Reasoning

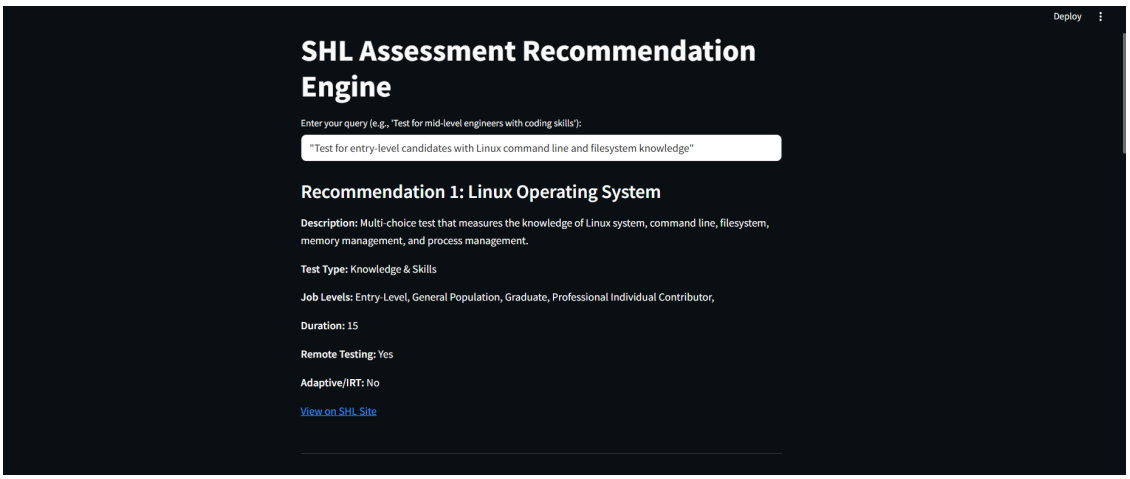
Description: Assesses how the candidate comprehends numerical information in various formats.
Test Type: Ability & Aptitude, Simulations
Job Levels: Graduate, Manager, Mid-Professional, Professional Individual Contributor,
Duration: 20
Remote Testing: Yes
Adaptive/IRT: Yes
URL:
https://www.shl.com/solutions/products/product-catalog/view/shl-verify-interactive-numerical-reasoning/

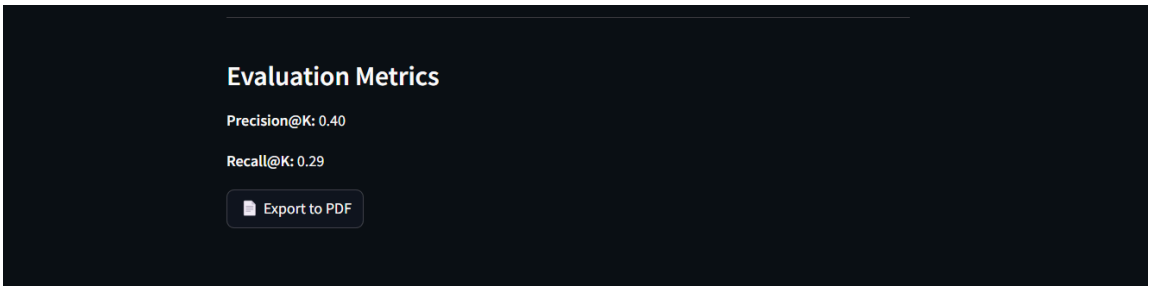
Recommendation 2: SHL Verify Interactive Numerical Calculation

Description: The Verify Interactive Numerical Calculation test measures a candidate's ability to work with numbers and use appropriate mathematics in different situations. The Numerical Ability test requires candidates to understand order of operations, perform numerical calculations, and identify errors in calculations. The Numerical Calculation test, though it is adaptive, is ideal for entry-level jobs that require completing simple numerical calculations quickly and accurately.
Test Type: Ability & Aptitude
Job Levels: Entry-Level,
Duration: 10
Remote Testing: Yes
Adaptive/IRT: Yes
URL: https://www.shl.com/solutions/products/product-catalog/view/shl-verify-interactive-numerical-calculation/

Output during model evaluation-

1. Input- "Test for entry-level candidates with Linux command line and filesystem knowledge"





Overall result-

you have calculated Precision@K and Recall@K for 7 queries, you can calculate the overall average Precision@K and Recall@K as follows:

5 queries had following metrics :

Precision@K = 0.4
Recall@K = 0.29

Rest 2 had following metrics:
Precision@K = 0.2
Recall@K = 0.14

Weighted Precision@K = ((5 * 0.4) + (2 * 0.2)) / (5 + 2)
= (2.0 + 0.4) / 7
= 2.4 / 7
= **0.34**

Weighted Recall@K = ((5 * 0.29) + (2 * 0.14)) / (5 + 2)
= (1.45 + 0.28) / 7
= 1.73 / 7
= **0.25**

➔ **NOTE - If Precision@K is 0.4 and Recall@K is 0.29 for a query, it means:**

- **40% of the top K recommendations are relevant.**
- **29% of all relevant documents are retrieved in the top K recommendations.**

Here are some suggestions for future enhancements to improve the recommendation system:

1. Improve Query Understanding
    - Natural Language Processing (NLP):
    - Use advanced NLP techniques to better understand user queries.
    - Implement query expansion to include synonyms or related terms for better matching.
    - Contextual Query Embeddings:
    - Use state-of-the-art models like BERT or Sentence Transformers to generate more accurate query embeddings.
2. Enhance Recommendation Accuracy
    - Fine-Tune Embedding Model:
    - Fine-tune the embedding model on domain-specific data (e.g., SHL assessments) to improve similarity calculations.
    - Hybrid Recommendation System:
    - Combine content-based filtering (current approach) with collaborative filtering to incorporate user preferences and behavior.
3. Optimize FAISS Index
    - Dynamic Index Updates:
    - Allow real-time updates to the FAISS index when new assessments are added or existing ones are modified.
    - Clustering:
    - Use clustering techniques to group similar assessments and improve search efficiency.