Script Plan (Slide by Slide)

1. Title Slide

   "Good [morning/afternoon]. Today I'll be presenting my project, Ranklens: A Mobile Search Engine Application with Machine Learning-based Ranking. This project combines information retrieval techniques like BM25, PageRank, and HITS with a mobile-friendly Android application. My name is Shakib."

2. Abstract

   "Ranklens is designed to be a lightweight but powerful search engine that runs on Android. It uses BM25 for ranking based on content, and optionally adds link-based ranking methods like PageRank and HITS. The app also includes login and registration features for personalization, making it both user-friendly and technically strong."

3. Introduction

   "As we know, the web has exploded with massive amounts of data. To find relevant information quickly, search engines are essential. Ranklens aims to implement hybrid ranking on a mobile device, showing how theoretical concepts can be turned into practical tools."

4. Literature Review

   "Traditionally, information retrieval started with TF-IDF and the vector space model. Later, BM25 improved relevance scoring and became a standard. On the other hand, PageRank and HITS introduced link-based ranking, focusing on authority and hubness. My project integrates these models into a single mobile platform."

5. Methodology

   "The project has three parts. First, I used a Python crawler in Google Colab to collect and preprocess web pages. Second, the BM25 algorithm was implemented for ranking, with optional link score integration. Finally, the results are displayed in an Android application, where users can search, adjust the alpha slider, and view results in real time."

6. Results & Analysis

   "The app works as expected: users can log in, register, and perform searches. The results are ranked by BM25, and when alpha is tuned, link scores can influence the ranking. On a test dataset of around 200 pages, the

app achieved a precision at 10 of about 72 percent, and a mean reciprocal rank of around 68 percent, which is quite promising."

7. Discussion

   "One strength of this system is that BM25 provides strong relevance. Another is that link scores help filter out irrelevant or spammy results. However, the dataset was small, and the app does not yet crawl in real time. In the future, I plan to integrate neural embeddings, Firebase storage, and personalization features."

8. Conclusion

   "In conclusion, Ranklens demonstrates how classic IR models like BM25, PageRank, and HITS can be implemented on a mobile app. It provides academic insights and shows real-world usability. This project could serve as a foundation for more advanced mobile search engines in the future."

9. References

   "Finally, I have based this project on several key references, including Manning's Introduction to Information Retrieval, Robertson's work on BM25, Brin and Page's PageRank paper, Kleinberg's HITS algorithm, and Android developer documentation."