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BE-47004

ISR LAB 3:

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import java.io.*;
import java.util.*;

public class InvertedFileIndex {

   static Map<String, Set<Integer>> invertedIndex = new HashMap<>();

   // Indexing function: reads file and updates inverted index
   public static void indexFile(String fileName, int fileNumber) throws IOException {
      BufferedReader br = new BufferedReader(new FileReader(fileName));
      String line;

      while ((line = br.readLine()) != null) {
         String[] words = line.toLowerCase().split("[ ,.;:'\"()?!]+");

         for (String word : words) {
            if (word.trim().length() == 0) continue;
            invertedIndex.computeIfAbsent(word, k -> new HashSet<>()).add(fileNumber);
         }
      }

      br.close();
   }

   // Display the entire inverted index
   public static void displayIndex() {
      System.out.println(" Inverted Index:");
      for (Map.Entry<String, Set<Integer>> entry : invertedIndex.entrySet()) {
         System.out.print(entry.getKey() + " -> ");
         for (int doc : entry.getValue()) {
```

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            System.out.print("File" + doc + " ");
        }
        System.out.println();
    }
}

// Retrieve files that contain a given word
public static void retrieveDocuments(String query) {
    query = query.toLowerCase();
    if (invertedIndex.containsKey(query)) {
        System.out.println(" The word '" + query + "' is found in: ");
        for (int fileNum : invertedIndex.get(query)) {
            System.out.println(" - File" + fileNum);
        }
    } else {
        System.out.println(" The word '" + query + "' is NOT found in any document.");
    }
}

// Main method
public static void main(String[] args) throws IOException {
    BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

    System.out.print(" Enter number of documents to index: ");
    int n = Integer.parseInt(br.readLine());

    for (int i = 1; i <= n; i++) {
        System.out.print("Enter file name for File" + i + ": ");
        String fileName = br.readLine();
        indexFile(fileName, i);
    }
```

```
        displayIndex();

        // Query phase
        String query;
        do {
            System.out.print(" Enter a word to search (or type 'exit' to quit): ");
            query = br.readLine();
            if (!query.equalsIgnoreCase("exit")) {
                retrieveDocuments(query);
            }
        } while (!query.equalsIgnoreCase("exit"));
    }
}
```

OUTPUT: