TicketBuddy - IT Troubleshooting Assistant

Problem Statement:

Modern IT support teams handle hundreds to thousands of internal tickets daily. Each ticket reflects an employee-reported issue, from frequently occurring problems to rare and challenging cases. While most of these problems have already been addressed in the past, support agents often spend significant time searching through historical tickets, documentation, and knowledge base articles to find relevant solutions.

This manual retrieval process is time-consuming, prone to error, and can increase the average resolution time, thereby delaying support and negatively impacting employee productivity. An intelligent system that can quickly identify relevant past tickets and troubleshooting guides, suggest likely root causes, and recommend next steps would greatly improve the efficiency, consistency, and quality of IT support services.

You are tasked with designing an AI-powered assistant that can:

1. Understand a new IT issue described in natural language (e.g., "My Outlook stopped syncing after I reset my password").
2. Retrieve the most relevant information from a knowledge base of past support tickets and troubleshooting guides.
3. Generate a clear and structured response containing:
   - Top 2 likely root causes
   - Suggested resolution steps
   - Evidence sources/references (file names or past ticket IDs used to derive the answer)

Example

User Query: My Jenkins build keeps failing after updating dependencies.

TicketBuddy Output:

```
{
  "root_causes": [
    "Dependency version conflict with Python 3.10",
    "Missing test dependency in build.yaml"
  ],
  "resolution_steps": [
    "Review the dependency list and upgrade pytest to latest version",
    "Rebuild Jenkins environment using clean virtual environment"
  ],
  "sources": [
    {"ticket_id": "ticket_102"},
    {"doc_name": "jenkins_build_issues.txt"}
  ]
}
```

Dataset Provided

1. Past Tickets Data (IT_tickets_data.xlsx)

Data dictionary

Column Name	Data Type	Description
ticket_id	Integer / String	Unique identifier for each support ticket
title	String	Short summary of the issue reported
description	String	Detailed description of the problem, including error messages and context
root_cause	String	The underlying reason the issue occurred
resolution	String	Steps taken to resolve the issue

2. Knowledge Base Documents

- Format: .txt files
- 10 documents covering common IT problem areas
- Each includes common issues, possible causes, Resolution steps, and tips.

3. User Queries for Testing (user_queries.xlsx)