AI Finance Agent

Overview

The AI Finance Agent is a voice-powered financial assistant that provides quick access to financial data through natural language queries. This intelligent agent uses Retrieval-Augmented Generation (RAG) technology to analyze financial records and provide accurate answers about invoices, income, expenses, and overall financial status.

Features

- **Voice Recognition**: Process spoken financial queries using speech-to-text technology
- **Intelligent Query Understanding**: Interpret various phrasings and handle common voice recognition errors
- **Financial Data Retrieval**: Access and analyze financial records including invoices and income
- **Comprehensive Financial Analysis**: Calculate totals, identify trends, and provide month-by-month breakdowns
- **Conversational Interface**: Communicate with natural language rather than complex financial commands

Installation Instructions

Prerequisites

- Python 3.9+ installed
- Microphone access for voice commands
- Internet connection (for initial package downloads)

Setup Process

1. **Extract the Project**: Unzip the AI Finance Agent folder to your preferred location

2. **Create a Python Environment**

```
# Using Anaconda (recommended)
conda create -n finance-agent python=3.10
conda activate finance-agent

# OR using standard Python venv
python -m venv finance-agent
# On Windows
finance-agent\Scripts\activate
# On macOS/Linux
source finance-agent/bin/activate
```

3. **Install Required Packages**

   # Navigate to project directory
   ```
   cd path/to/ai-finance-agent
   ```

   # Install dependencies
   ```
   pip install -r requirements.txt
   ```

4. **Prepare Financial Data**
   - Default financial data is included in data/financial_data.txt
   - To use your own data, replace this file with your financial records following the same format:
     - Invoice format: Invoice #001 | January 15, 2024 | Office Supplies | $250
     - Income format: Income #001 | January 02, 2024 | Client A - Website Project | $3500

5. **Launch the Application**

   ```
   python main.py
   ```

   - On first run, the system will process financial data and build the retrieval model (may take a few moments)
   - When ready, you'll see: 🎤 Listening for command...

Using the AI Finance Agent

Voice Commands
The agent responds to a wide range of natural language queries. Below are examples of supported command categories:

📄 General Financial Queries

- "What's my financial balance?"
- "What's my current financial situation?"
- "Show me my financial summary"
- "What's my net profit or loss?"

💵 Expense Queries

- "What are my total expenses?"
- "How much did I spend last month?"
- "What were my March expenses?"
- "Show me my highest expense"
- "What's my most recent invoice?"
- "Tell me about invoice #003"

💰 Income Queries

- "What's my total income?"
- "How much money did I earn in February?"
- "What's my highest income source?"
- "When was my most recent income?"
- "Give me details on income #005"

📅 Time Period Analysis

- "How did I do financially in April?"
- "Compare my January income and expenses"
- "What was my profit in March?"
- "Which month had the highest expenses?"

🤖 System Commands

- "Exit" or "Quit" or "Stop" - Ends the application

Tips for Optimal Use

- **Speak clearly** and at a moderate pace
- Start with **trigger phrases** like "show me," "tell me about," or "what is"
- Include **key terms** like "income," "expense," "invoice," or "balance"
- For specific entries, clearly state the **ID number** (e.g., "invoice number 003")
- For month-specific queries, clearly state the **month name**

Technical Information

The AI Finance Agent employs a modular architecture:

- **Voice Recognition Module**: Captures and processes spoken commands
- **Intent Parser**: Analyzes text to determine the user's financial question
- **RAG Engine**: Retrieves relevant financial information from the database
- **Response Generator**: Formulates natural language answers based on retrieved data

Data Processing

The system processes financial records through several steps:

1. Initial parsing of raw financial data
2. Chunking into retrievable segments
3. Embedding using sentence transformers
4. Semantic retrieval based on query similarity
5. Context-aware answer formatting

Troubleshooting

Common Issues

- **Microphone Not Detected**: Ensure your microphone is properly connected and has system permissions
- **Voice Recognition Errors**: Speak clearly and reduce background noise
- **"Command not understood"**: Try rephrasing with key financial terms (invoice, expense, income, etc.)
- **Incorrect Financial Data**: Verify the format of your financial_data.txt file

Support

For technical support or questions about the AI Finance Agent, please contact me.

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