**Documentation: OCR, Data Extraction, and Visualization Tool**

**Overview**

This tool allows users to upload document images, extract textual information using OCR (Optical Character Recognition), analyze the extracted data, and visualize it in various formats. It supports specific document types and is built using Python libraries such as PaddleOCR, Cohere API, Matplotlib, and Gradio.

**Features**

1. **OCR Processing**: Extracts text from uploaded images using PaddleOCR.
2. **Data Analysis**: Analyzes the extracted text using Cohere's AI model to retrieve specific fields based on the document type.
3. **Visualization**: Visualizes numeric data as bar plots or pie charts.
4. **Interactive UI**: A Gradio-based interface for user interaction.

**Dependencies**

The tool requires the following Python libraries:

* **PaddleOCR**: For OCR text extraction from images.
* **Cohere**: For processing text and extracting structured information.
* **Gradio**: For creating the interactive web-based interface.
* **Matplotlib**: For generating visualizations.
* **Pandas, OpenCV, NumPy**: For data handling and image processing.

**How It Works**

1. **Document Upload**:
   * Users upload one or more images of documents.
   * Supported document formats include salary slips, profit and loss statements, and checks.
2. **OCR and Text Extraction**:
   * The tool uses PaddleOCR to detect and extract text from the images.
   * The extracted text is concatenated into a single string.
3. **Data Analysis with Cohere**:
   * The extracted text is sent to Cohere's AI model with a tailored prompt to extract specific fields based on the document type:
     + **Salary Slip**: Net Salary, Gross Salary, Basic Salary.
     + **Profit and Loss Statement**: Total Revenue, Net Income.
     + **Check**: Account Number, Amount, Bank Name.
   * The AI response is parsed to retrieve the requested fields.
4. **Visualization**:
   * Numeric data extracted from the text is processed.
   * Users can choose between:
     + **Bar Plot**: A bar graph representation of the numeric fields.
     + **Pie Chart**: A pie chart showing the percentage contribution of each field.
5. **Output**:
   * Textual information is displayed in a text box.
   * Visualizations are rendered as images in the interface.

**User Interface**

1. **Document Type Selection**: Choose the type of document (e.g., Salary Slip, Profit and Loss Statement, Check).
2. **File Upload**: Upload one or more images of the document.
3. **Visualization Type**: Choose a visualization type (Bar Plot or Pie Chart).
4. **Results**:
   * Extracted information is displayed in a text box.
   * Visualized data is shown as an image.

**Use Cases**

1. **Financial Analysis**:
   * Quickly extract and analyze financial details from salary slips or profit and loss statements.
2. **Check Processing**:
   * Extract bank details, account numbers, and amounts from scanned checks.
3. **Data Visualization**:
   * Simplify numeric data representation with user-friendly plots.

**Limitations**

1. **Language Support**:
   * Currently supports English text extraction and processing.
2. **OCR Accuracy**:
   * The quality of OCR depends on the clarity of uploaded images.
3. **Custom Fields**:
   * The tool is tailored to predefined fields and may not extract additional information.

**Requirements**

1. **PaddleOCR Setup**:
   * Install and initialize PaddleOCR for text detection.
2. **Cohere API Key**:
   * A valid Cohere API key is required for text analysis.
3. **Python Environment**:
   * Ensure all dependencies are installed before running the tool.

**Conclusion**

This tool provides an end-to-end solution for document text extraction, structured data analysis, and visualization. Its interactive interface makes it accessible for users with minimal technical expertise, enabling streamlined processing of document images.