Smart PDF Analyzer

Complete Setup Guide

> **Competition Edition**
>
> Professional PDF Analysis Tool with AI Integration

Version	1.0
Release	February 2026
Platform	Windows, Mac, Linux

Made with for the Competition

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Contents

1   Introduction

> **What is Smart PDF Analyzer?**
>
> **Smart PDF Analyzer** is a powerful desktop application designed for PDF analysis with AI capabilities. It combines traditional PDF processing with cutting-edge AI to provide comprehensive document understanding.

Key Features:

Text Extraction: Extract and analyze text from any PDF

Image Extraction: Extract and display images from PDFs

AI Question Answering: Powered by Groq LLM

Image Analysis: AI-powered image descriptions via OpenRouter

Smart Search: Contextual search within documents

Entity Recognition: Identify people, places, events

2   System Requirements

2.1   Minimum Requirements

Component	Specification
Operating System	Windows 7+, macOS 10.12+, Ubuntu 18.04+
Python Version	3.8 or higher
RAM	2 GB minimum
Storage	100 MB free space
Internet	Required for AI features

2.2   Recommended Specifications

Component	Specification
RAM	4 GB or more
Storage	500 MB free space
Processor	Intel i3 / AMD equivalent
Internet	Broadband connection

2.3   Required Packages

Package	Purpose	Size
PyMuPDF (fitz)	PDF processing	15 MB
Pillow	Image handling	10 MB
requests	API calls	5 MB
groq	Groq AI client	2 MB

| tkinter | GUI (built-in) | Built-in |

3 Installation Guide

3.1 Step 1: Check Python Installation

Open **Command Prompt (Windows)** or **Terminal (Mac/Linux)**:

```
python --version
```

> **Python Not Found?**
>
> **Windows:** Download from https://python.org
> **Mac:** `brew install python` or download from python.org
> **Linux:** `sudo apt-get install python3` (Ubuntu/Debian)

3.2 Step 2: Create Project Folder

```
# Windows
mkdir Desktop\PDF_Analyzer
cd Desktop\PDF_Analyzer

# Mac/Linux
mkdir ~/Desktop/PDF_Analyzer
cd ~/Desktop/PDF_Analyzer
```

3.3 Step 3: Install Required Packages

```
# Install all packages at once
pip install PyMuPDF pillow requests groq

# If permission errors occur
pip install --user PyMuPDF pillow requests groq

# On Mac/Linux (if needed)
sudo pip install PyMuPDF pillow requests groq
```

3.4 Step 4: Verify Installation

```
1 # Check installed packages
2 pip list
3
4 # Test imports
5 python -c "import fitz; import PIL; import requests; print('
    All good!')"
```

4 API Key Setup

4.1 Groq API Key (for Smart Q&A)

1. Visit https://console.groq.com

2. Sign up using Google/GitHub or email

3. Navigate to **API Keys** section

4. Click **"Create API Key"**

5. Copy the key (starts with `gsk_...`)

> **Groq Free Tier**
> - 30 requests per minute
> - Multiple models available
> - No credit card required

4.2 OpenRouter API Key (for Image Analysis)

1. Visit https://openrouter.ai

2. Sign up (Google/GitHub recommended)

3. Go to **Keys** page

4. Click **"Create Key"**

5. Copy the key (starts with `sk-or-v1-...`)

> **OpenRouter Credits**
> - Free credits on signup
> - Multiple vision models available
> - Pay-as-you-go after credits

4.3   Adding Keys to Code

Option 1: Direct in Code (For Testing)

```
# Find these lines (around line 45-46)
self.groq_api_key = "your-groq-key-here"
self.openrouter_api_key = "your-openrouter-key-here"
```

Option 2: Using Variables

```
# Better approach - add at top of file
GROQ_API_KEY = "your-groq-key-here"
OPENROUTER_API_KEY = "your-openrouter-key-here"
```

5   How to Run

5.1   Method 1: Direct Command Line

```
cd Desktop/PDF_Analyzer
python smart_pdf_analyzer.py
```

5.2   Method 2: Create Batch File (Windows)

Create `run.bat`:

```
@echo off
cd /d "%~dp0"
python smart_pdf_analyzer.py
pause
```

5.3   Method 3: Create Shell Script (Mac/Linux)

Create `run.sh`:

```
#!/bin/bash
cd "$(dirname "$0")"
python3 smart_pdf_analyzer.py
```

Make it executable:

```
1  chmod +x run.sh
2  ./run.sh
```

6 Features Guide

6.1 Main Interface Layout

Section	Function
Left Panel - PDF Selection	Browse and load PDF files
Left Panel - Image Analysis	Extract and analyze images
Left Panel - AI Mode	Choose Smart/Fast mode
Right Panel - Page View	Display PDF text
Right Panel - Image Preview	Show extracted images
Right Panel - Analysis	Entities, Keywords, Events
Bottom Panel - Q&A	Ask questions, get answers

6.2 Step-by-Step Usage

Step 1: Load PDF

- Click **" Browse PDF"**

- Select any PDF file

- Wait for images to extract automatically

Step 2: Analyze Text

- Click **" START ANALYSIS"**

- Progress bar shows status

- Text appears in right panel

- Entities/Keywords/Events are extracted automatically

Step 3: View Images

- Use **PREV** / **NEXT** buttons

- Image count shows at bottom

- Click image to see details

Step 4: Analyze Images

- Select model from dropdown

- Click **" Analyze Images"**

- Wait for AI to process

- Descriptions appear in bottom section

Step 5: Ask Questions

- Type question in search box

- Choose mode:

    - **Smart Mode:** Uses Groq AI (requires API key)
    - **Fast Mode:** Rule-based (offline)

- Click **" ASK GROQ AI"**

- Get detailed answers with page references

7 Troubleshooting

7.1 Common Issues and Solutions

Problem	Solution
"Python not found"	Install Python from python.org
"No module named fitz"	Run: `pip install PyMuPDF`
"pip not recognized"	Use: `python -m pip install [package]`
Permission denied	Run as Admin (Windows) or use `sudo` (Mac/Linux)
Tkinter not found	`sudo apt-get install python3-tk` (Linux)
API key errors	Check keys are correct and active
No images showing	PDF may have no extractable images
Program is slow	Large PDFs take time; be patient
Groq not working	Check internet and API key balance

7.2 Windows-Specific Issues

DLL Errors

```
# Install Visual C++ Redistributable
# Download from: https://aka.ms/vs/17/release/vc_redist.x64.exe
```

> **Python Not in PATH**
>
> - Reinstall Python and check "Add Python to PATH"
> - Or use full path: `C:\Python39\python.exe script.py`

7.3 Mac-Specific Issues

> **SSL Certificate Error**
>
> ```
> /Applications/Python\ 3.9/Install\ Certificates.command
> ```

> **Tkinter Issues**
>
> ```
> brew install python-tk
> ```

7.4 Linux-Specific Issues

Ubuntu/Debian:

```
sudo apt-get update
sudo apt-get install python3-pip python3-tk
sudo apt-get install libjpeg-dev zlib1g-dev
```

Fedora:

```
sudo dnf install python3-tkinter
sudo dnf install libjpeg-devel zlib-devel
```

8 Frequently Asked Questions

1. **Q: Do I need internet to use this?**

   A:

   - **Yes for:** Groq AI, image analysis
   - **No for:** PDF text extraction, basic analysis, page navigation

2. **Q: Are the APIs free?**

   A:

   - **Groq:** Free tier available (30 requests/min)
   - **OpenRouter:** Free credits on signup, then pay-as-you-go

3. **Q: Can I use it without API keys?**

   A: Yes! Fast Mode works completely offline with rule-based answers.

4. **Q: What file types are supported?**

   A: Currently only PDF files (.pdf)

5. **Q: How large PDFs can I analyze?**

   A:

   - Text analysis: Any size (slower for large files)
   - Image extraction: Depends on RAM (recommend ¡100 pages)

6. **Q: Why are images not extracting?**

   A: Possible reasons:

   - PDF has no embedded images
   - Images are in vector format
   - PDF is scanned (no actual images)

7. **Q: How accurate is the AI analysis?**

   A:

   - **Groq models:** Very accurate for text
   - **Image models:** Good for object detection
   - **Rule-based:** Basic but reliable

8. **Q: Can I save the results?**

   A: Currently the app doesn't save results, but you can copy-paste.

9. **Q: Is my data safe?**

   A:

   - PDFs stay on your computer
   - Only text sent to APIs for analysis
   - No data stored on servers

10. **Q: Why is it slow?**

    A: Factors affecting speed:

    - PDF size (pages)
    - Number of images
    - Internet speed
    - API response time
    - Computer specifications

9   Quick Reference

9.1   Keyboard Shortcuts

Key	Action
`Enter` in search	Ask question
`Ctrl+O`	Browse PDF
`Ctrl+Q`	Quit
←	Previous page
→	Next page
↑	Previous image
↓	Next image

9.2   Command Cheat Sheet

```
1   # Install everything
2   pip install PyMuPDF pillow requests groq
3
4   # Update packages
5   pip install --upgrade PyMuPDF pillow requests groq
6
7   # Check versions
8   python --version
9   pip show PyMuPDF pillow requests groq
10
11  # Uninstall if needed
12  pip uninstall PyMuPDF pillow requests groq
13
14  # Run with different Python versions
15  python3 smart_pdf_analyzer.py
16  py -3.9 smart_pdf_analyzer.py
```

9.3   API Endpoints

- **Groq Console:** https://console.groq.com

- **Groq Docs:** https://console.groq.com/docs

- **OpenRouter:** https://openrouter.ai

- **OpenRouter Docs:** https://openrouter.ai/docs

9.4 requirements.txt

```
1  PyMuPDF==1.23.26
2  Pillow==10.1.0
3  requests==2.31.0
4  groq==0.5.0
```

10 Installation Checklist

Task	Status
Python 3.8+ installed	
All packages installed	
API keys obtained	
Application runs without errors	
Can load PDF files	
Text extraction works	
Image extraction works	
Groq AI responds	
Image analysis works	
All features tested	

11 Conclusion

You're All Set!

Enjoy using Smart PDF Analyzer - Competition Edition!

Remember:

- Practice with different PDFs

- Test all features before competition

- Keep API keys handy

- Have fun analyzing!

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