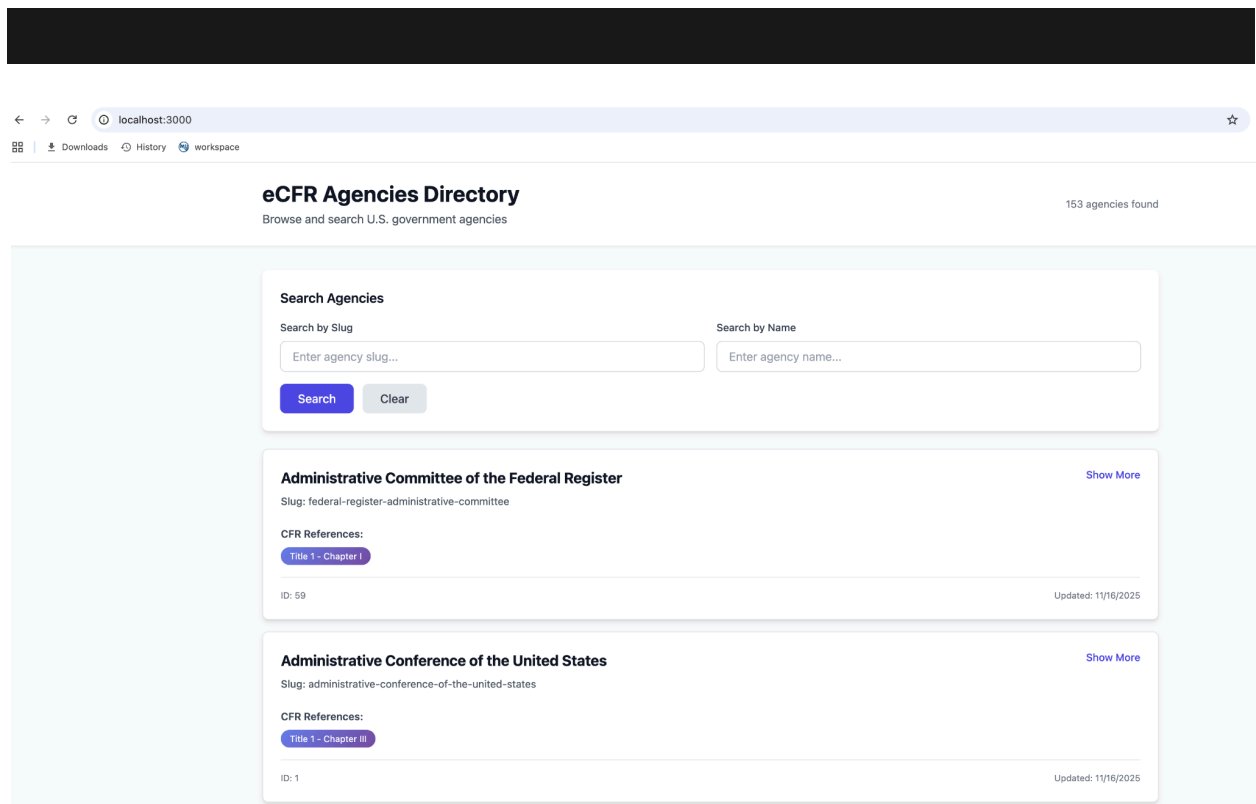


AI Powered eCFR Agencies Project

This project is a comprehensive system for managing and displaying U.S. government agencies from the Electronic Code of Federal Regulations (eCFR). It consists of multiple components working together to provide a complete solution for agency data ingestion, storage, API access, and web-based visualization with AI-powered insights.

Below is the screenshot of the UI which shows all the eCFR agencies. One can search by Slug or Name as shown below:



When clicked on show more, it gives Agency wide statistics and each Title wide statistics. It gives details like total word count, characters, versioning details like last amended, issued and upto date as. I have also integrated this with OpenAI to give **AI analysis** and provides:

1. 2-3 sentence summary of the agency's role and mission
2. Key responsibilities
3. A brief description of the agency's regulatory scope.

Details Screen:

localhost:3000

DownloadsHistoryworkspace

Administrative Committee of the Federal Register

Slug: federal-register-administrative-committee

CFR References:1/1 chapters with data

Title 1 - Chapter I

AI-Powered AnalysisGenerated 3/54:12 PM

Agency Overview

The Administrative Committee of the Federal Register oversees the publication of the Federal Register, which serves as the official daily publication for rules, proposed rules, and notices of federal agencies.

Key Responsibilities

Ensuring the accuracy and integrity of the Federal Register publications

Reviewing and approving agency submissions for publication in the Federal Register

Developing policies and procedures related to the Federal Register publication process

Regulatory Scope

The agency's regulatory scope primarily focuses on the accurate and timely publication of federal agencies' rules, proposed rules, and notices in the Federal Register to inform the public about the government's regulatory activities.

Agency-Wide Statistics

12,897Total Words

58Total Characters

1Chapters with Data

0Reserved Chapters

Title 1

Chapter Statistics:
Words: 12,897
Chapter: 1
Downloaded: 11/15/2025

Characters: 58
Heading: CHAPTER I—ADMINISTRATIVE COMMITTEE OF THE FEDERAL REGISTER

Latest Amended: 12/28/2022
Latest Issue: 5/16/2024
Up to Date As: 9/29/2025

Advisory Council on Historic Preservation

Slug: advisory-council-on-historic-preservation

CFR References:

Title 36 - Chapter VIII

Generated 4:31:05 PM

AI-Powered Analysis

Agency Overview

The Advisory Council on Historic Preservation (ACHP) advises the President and Congress on historic preservation matters, promotes historic preservation nationwide, and oversees the implementation of the National Historic Preservation Act.

Key Responsibilities

- Advising the President and Congress on historic preservation policies and programs
- Promoting public awareness and understanding of historic preservation
- Reviewing federal undertakings that may affect historic properties and providing recommendations for their preservation
- Overseeing the Section 106 review process for federal projects

Regulatory Scope

The ACHP's regulatory scope primarily focuses on ensuring that federal agencies comply with the National Historic Preservation Act and consider the effects of their activities on historic properties. The agency works to strike a balance between development and preservation to protect the nation's cultural heritage.

Agency-Wide Statistics

31,039 Total Words	54 Total Characters	1 Chapters with Data	0 Reserved Chapters
------------------------------	-------------------------------	--------------------------------	-------------------------------

Title 36

Chapter Statistics:
Words: 31,039
Chapter: VIII
Downloaded: 11/15/2025

Characters: 54
Heading: CHAPTER VIII—ADVISORY COUNCIL ON HISTORIC PRESERVATION

Latest Amended: 7/17/2025
 Latest Issue: 9/16/2025
 Up to Date As: 9/29/2025

Search Screen:

localhost:3000

loadsHistoryworkspace

eCFR Agencies Directory

Browse and search U.S. government agencies

2 agencies found

Search Agencies

Search by Slug

Enter agency slug...

SearchClear

Search by Name

Administrative

Administrative Committee of the Federal Register

Show More

Slug: federal-register-administrative-committee

CFR References:

Title 1 - Chapter I

ID: 59Updated: 11/16/2025

Administrative Conference of the United States

Show More

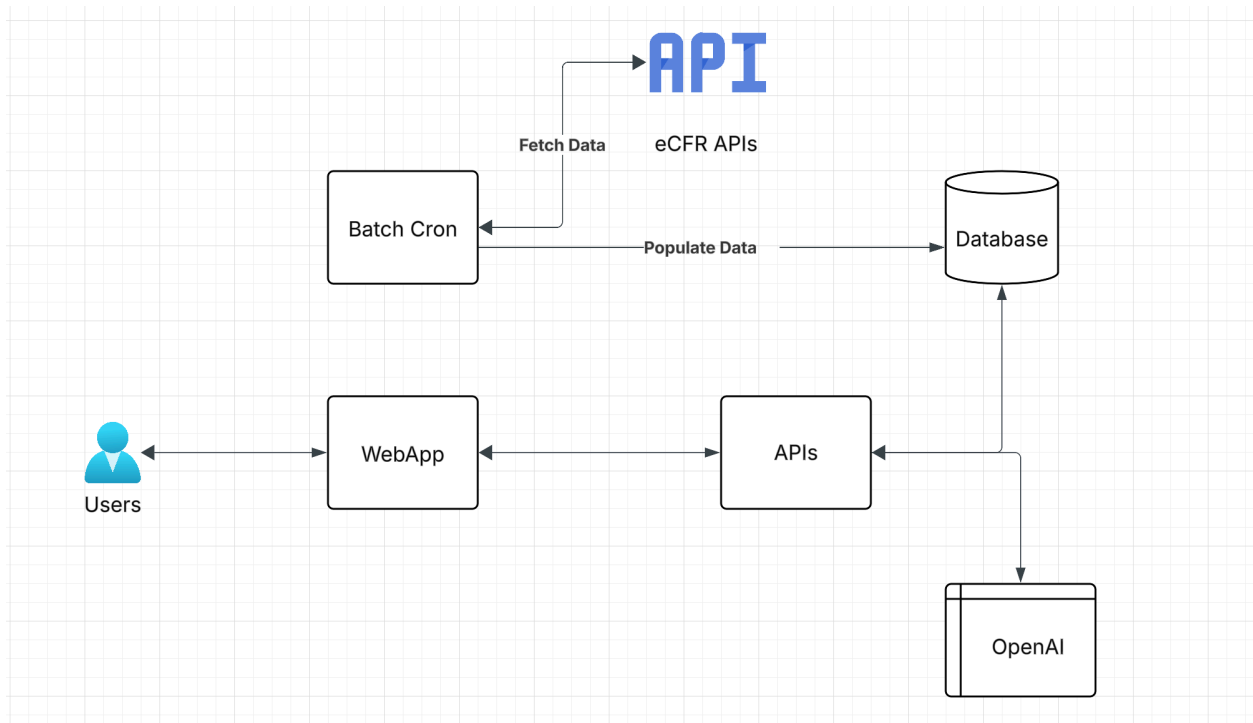
Slug: administrative-conference-of-the-united-states

CFR References:

Title 1 - Chapter III

ID: 1Updated: 11/16/2025

Architecture:



Data Ingestion Batch jobs:

Have created two scripts in python to populate Agents and Title details.

- `local_agencies.py` : Ingests and manages U.S. government agency data from eCFR API into PostgreSQL. Creates agencies and titles tables. Fetches agency and title data from eCFR APIs
- `local_title.py` : Processes and analyzes word counts for CFR chapters and titles and stores in `ecfr_chapter_wordcount` Table.

Database Schema:

I have used a local postgres db

```

-- Agencies Table
CREATE TABLE IF NOT EXISTS agencies (
  id SERIAL PRIMARY KEY,
  name TEXT NOT NULL,
  display_name TEXT,
  slug TEXT UNIQUE,
  children JSONB,
  cfr_references JSONB,
  raw_data JSONB,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);

-- Titles Table
CREATE TABLE IF NOT EXISTS titles (
  id SERIAL PRIMARY KEY,
  title_number INTEGER UNIQUE NOT NULL,
  title_name TEXT NOT NULL,
  title_abbreviation TEXT,
  chapter_count INTEGER DEFAULT 0,
  is_reserved BOOLEAN DEFAULT FALSE,
  latest_amended_on DATE,
  latest_issue_date DATE,
  up_to_date_as_of DATE,
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);

CREATE TABLE IF NOT EXISTS ecfr_chapter_wordcount (
  id SERIAL PRIMARY KEY,
  title INTEGER NOT NULL,
  chapter_identifier TEXT,
  chapter_heading TEXT,
  word_count INTEGER NOT NULL,
  character_count INTEGER,
  is_reserved BOOLEAN DEFAULT FALSE,
  downloaded_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);

```

API Backend Layer:

Agency_api.py- Rest API server using FastAPI

Provides a comprehensive REST API for accessing agency data, word counts, and AI-powered summaries.

Agencies:

- GET /agencies - Retrieve all agencies with optional filtering
 - Query Parameters: slug, name
 - Response: List of agencies with CFR references

Word Counts:

- GET /word-count/{title}/{chapter_identifier} - Get specific chapter word count
- GET /word-counts/{title} - Get all word counts for a title

AI- Powered Summaries:

- POST /ai/agency-summary - Generate AI-powered agency summary
 - Request: Agency name, CFR references, description
 - Response: Structured summary with responsibilities and scope

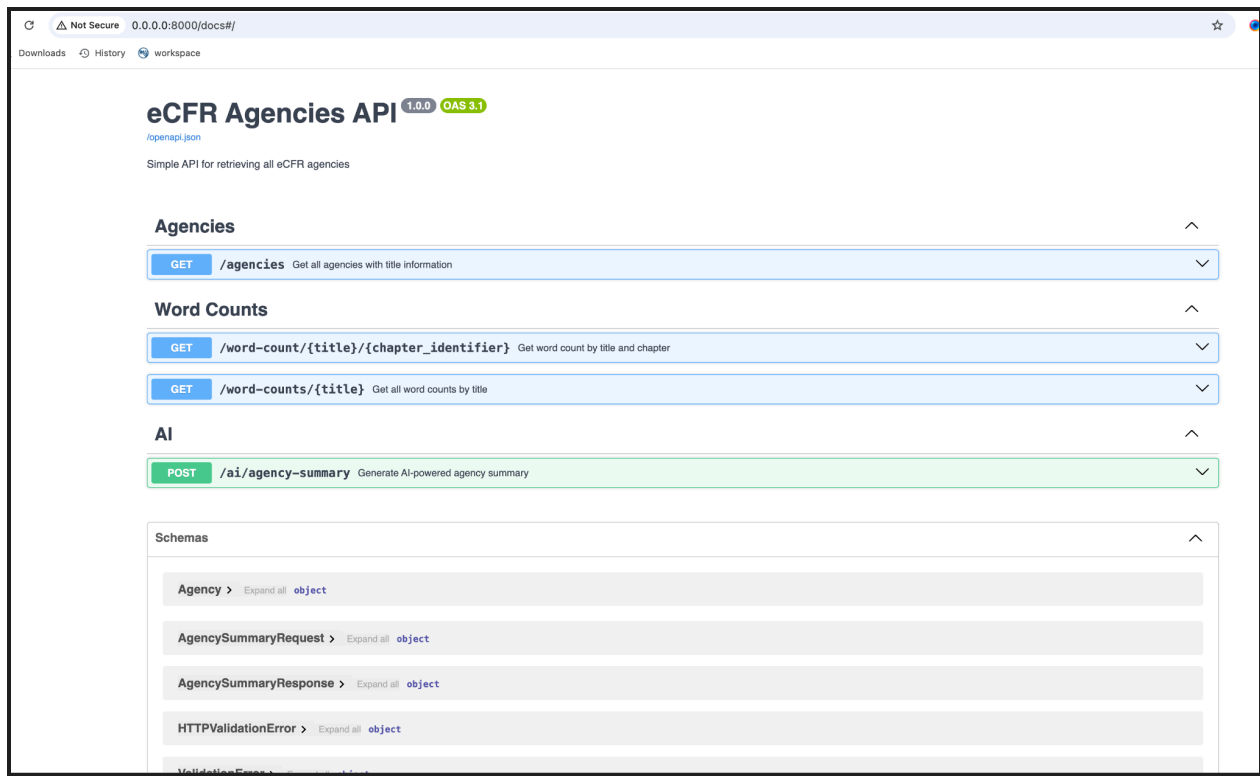
Script:

Start the API server

./start_api.sh

API Documentation: Available at <http://localhost:8000/docs>

OpenAPI:



React Frontend Application:

UI/index.html: Single page react application

Provides a responsive web interface for browsing and analyzing agency data.

- Agency Directory: Browse all U.S. government agencies
- Search Functionality: Real-time search by agency name
- Expandable Cards: Detailed information with smooth animations
- Word Count Analytics: Display aggregated statistics per agency
- AI-Powered Insights: Dynamic AI-generated agency summaries
- Professional UI: Modern design with Tailwind CSS
- Axios: HTTP client for API communication

Key Features:

1. Search & Filter:
2. Agency Cards:
3. AI Summary Section:
4. Word Count Analytics:

Usage:

Navigate to UI directory: cd UI

Start development server: npm start

Access at <http://localhost:3000>

Potential Improvements

1. Caching Layer: Redis for API response caching
2. Authentication: User authentication and authorization
3. Advanced Search: Full-text search with Elasticsearch
4. Data Visualization: Charts and graphs for analytics
5. Export Features: PDF/CSV export capabilities
6. Real-time Updates: Set up system for live data updates
7. Advanced AI: More sophisticated AI analysis and insights