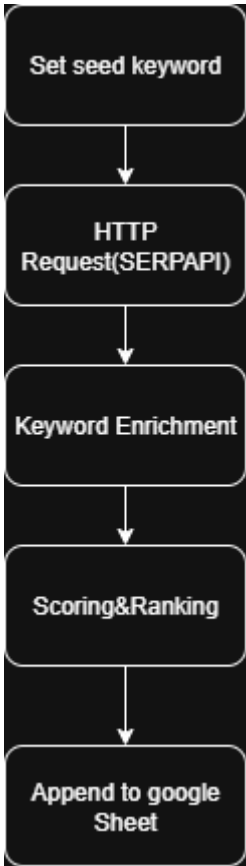


AI Agent for SEO Keyword Research

This document outlines the **AI Agent for SEO Keyword Research** built using **n8n**. The system automates keyword extraction, enrichment, scoring, and ranking to help SEO professionals identify high-value, low-competition keywords efficiently. The agent integrates data APIs, applies a weighted scoring formula, and exports results to Google Sheets for analysis.



1. Workflow Overview

Set Seed Keyword	Defines the initial search term for keyword expansion, e.g., 'AI tools'.
HTTP Request (SerpApi)	Fetches organic results, titles, and related searches as base candidates.
Keyword Enrichment	Adds estimated metrics like monthly search volume, competition, and intent
Scoring & Ranking	Applies a weighted formula to prioritize high-potential keywords.
Append to Google Sheet	Exports the top 50 ranked keywords with metrics for easy review.

match.

3. Keyword Enrichment Process

- Each candidate keyword is enriched with essential SEO metrics:
- **Monthly Volume:** Estimated or fetched from APIs like DataForSEO to indicate average searches per month.
 - **Competition:** Float between 0–1, representing keyword difficulty.
 - **Intent Match:** Cosine similarity (0–1) between candidate and seed keyword embedding.

These values allow the agent to quantify keyword potential before ranking.

4. Scoring and Ranking Formula

The final keyword score is computed using a weighted formula to balance visibility and difficulty:

$$\text{Score} = (0.4 \times \text{NormalizedVolume}) + (0.3 \times (1 - \text{Competition})) + (0.3 \times \text{IntentMatch})$$

Explanation:

- **NormalizedVolume** = $\text{Volume} \div 10,000$ (keeps scale 0–1).
- **(1 – Competition)** rewards easier-to-rank keywords.
- **IntentMatch** ensures contextual alignment with the original keyword.

The top 50 keywords are ranked in descending order of this score for output.

5. Output and Future Enhancements

The workflow exports keyword data to Google Sheets with columns for keyword, volume, competition, intent match, and final score, providing a structured dashboard for SEO teams.

Planned Enhancements:

- Integrate real search metrics from APIs (DataForSEO, Ahrefs, SEMrush).
- Use semantic clustering to group similar keywords.
- Add historical trend tracking for performance analytics.