

EduKeySearch

DFA-Optimized Keyword Search Engine for Intelligent Tutoring Systems Developed by Shyam Raj D, IT Department.

Name: Shyam Raj D

Department: Information Technology

Student ID: 7376222IT254



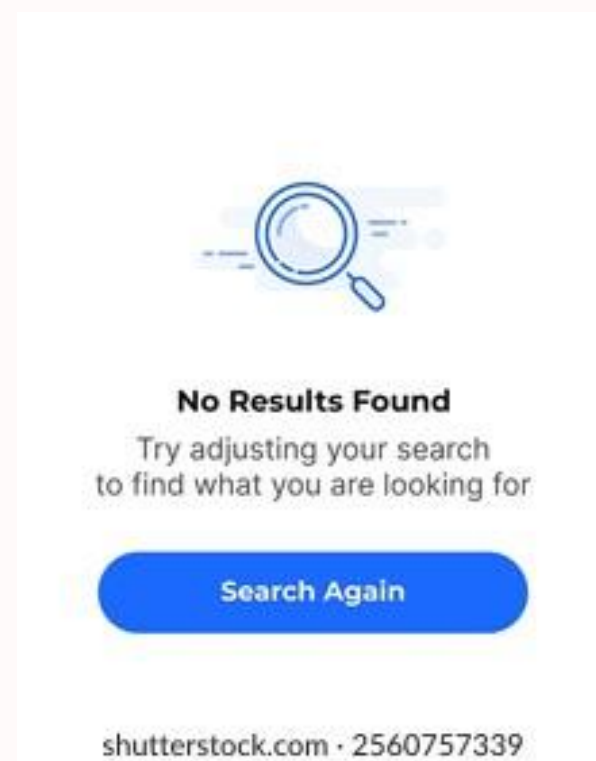


➤ Why This Project?

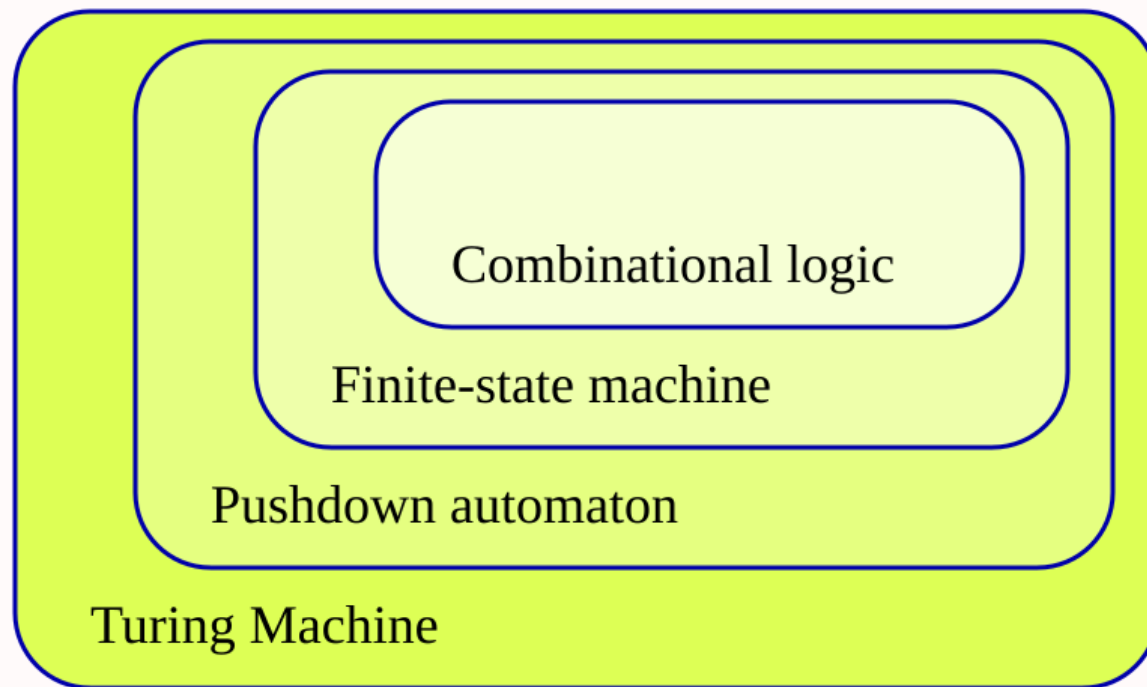
1. With the rapid growth of online learning, **educational platforms are flooded with resources**.
2. Students often face **difficulty locating specific content** they need, even if it's already available.
3. **Traditional search methods** (like substring search) can be slow, inaccurate, and context-blind.

➤ The Need

1. To build a **smarter search system** that:
 1. Supports **fast** and **accurate** keyword detection,
 2. Helps students **instantly find** relevant learning materials,
 3. And enhances the **usability and effectiveness** of tutoring platforms.



Automata theory



➤ What is DFA and How is it Used?

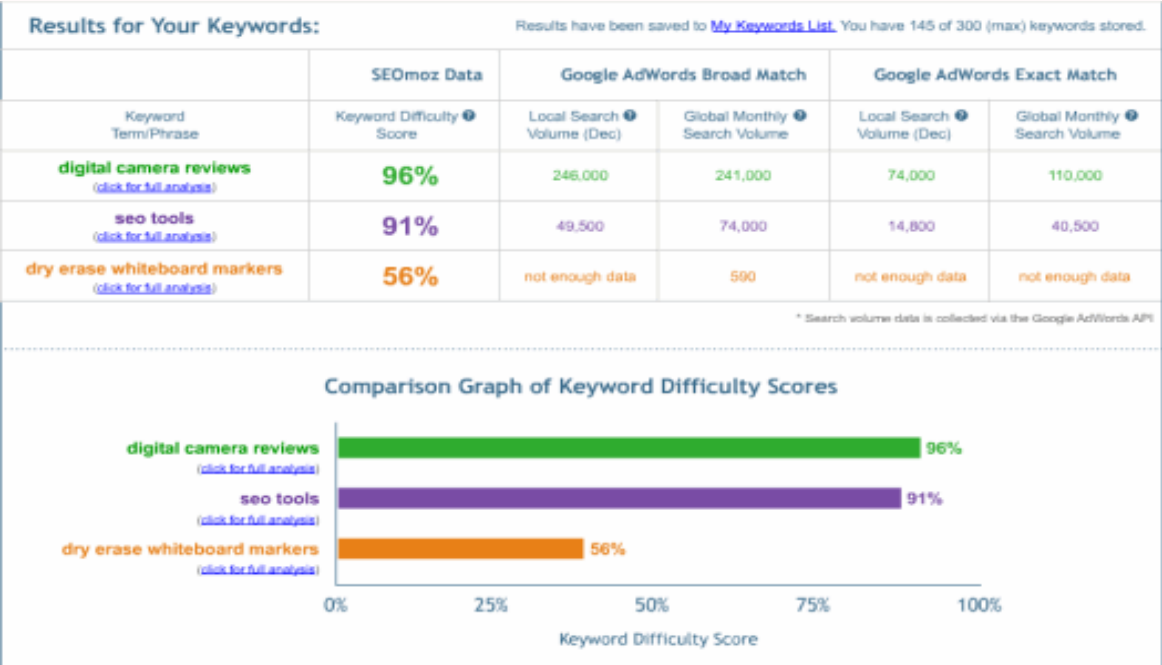
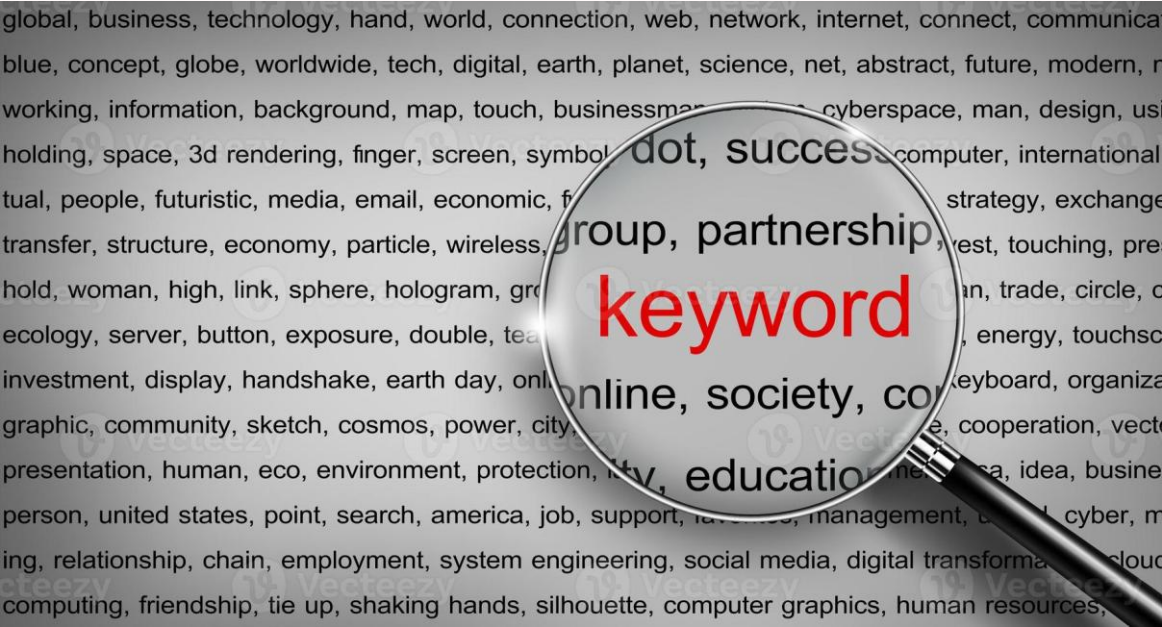
- **DFA (Deterministic Finite Automaton)** is a state machine-based algorithm used for **pattern recognition** in strings.
- It processes input **character by character**, transitioning between predefined states to determine if a pattern exists.

➤ How We Use DFA in This App

- For each keyword a user enters, the app **constructs a custom DFA**.
- It then **scans each course title** using this DFA to quickly detect keyword presence.
- This method ensures **consistent time complexity**, regardless of input size.

➤ **Key Highlights of EduKeySearch**

- 1. Real-time keyword matching powered by DFA (Deterministic Finite Automaton) for fast and precise content discovery.
- 2. Courses are displayed using a clean and responsive card layout, each accompanied by a relevant image to enhance visual understanding.
- 3. Supports searching with one or multiple keywords, improving the accuracy and flexibility of the search results.
- 4. The interface is optimized for clarity, responsiveness, and overall learning experience, making it easy to use on both desktop and mobile devices.



EduKeySearch

DFA-based Keyword Search Engine for Intelligent Tutoring Systems

The use_column_width parameter has been deprecated and will be removed in a future release. Please utilize the use_container_width parameter instead.



About This Project

This project demonstrates the use of **Deterministic Finite Automaton (DFA)** for fast and efficient keyword-based content search within an **Intelligent Tutoring System (ITS)**.

Course Search

Use DFA-based keyword matching to search relevant topics.

Enter keywords (e.g., recursion stack):

All Courses



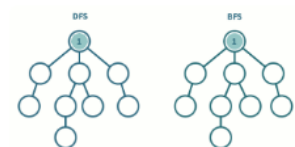
Binary Search in Data Structures



Bubble Sort Algorithm Explained



Understanding Stack vs Queue



Depth First Search (DFS) and Breadth First Search (BFS)

Live Project :

Link : [Live Demo](#)

GitHub Repo : [Link](#)

Technologies Used:

1. **Python** – Core logic and backend development
2. **Streamlit** – Web app framework for building interactive Uis
3. **PIL (Pillow)** – Image processing and rendering
4. **Requests** – Fetching and displaying images from online sources
5. **DFA Algorithm** – Efficient keyword-based search using Deterministic Finite Automaton


```

def __init__(self, path):
    self.file = None
    self.fingerprints = set()
    self.logdups = True
    self.debug = debug
    self.logger = logging.getLogger(__name__)
    if path:
        self.file = open(os.path.join(path, 'fingerprints.txt'), 'a')
        self.file.seek(0)
        self.fingerprints.update(set(self._get_fingerprints(path)))

    @classmethod
    def from_settings(cls, settings):
        debug = settings.getbool('debug')
        return cls(job_dir(settings), debug)

    def request_seen(self, request):
        fp = self.request_fingerprint(request)
        if fp in self.fingerprints:
            return True
        self.fingerprints.add(fp)
        if self.file:
            self.file.write(fp + os.linesep)

    def request_fingerprint(self, request):
        return request_fingerprint(request)

```

Conclusion:

EduKeySearch redefines how learners discover educational content in Intelligent Tutoring Systems. By leveraging a DFA-based keyword search engine, the system offers a fast, lightweight, and intuitive way for students to access relevant materials in real time. It's designed to be responsive, accurate, and user-centric — ideal for modern digital learning environments.

Developer Information:

Name: Shyam Raj D

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