



Multi-Language Flashcard and Summarization Tool

Shashank Narayan R 2022115134

Varshitha R 2022115098

Bavishyaa Sriraman 2022115130

Introduction

- Cardsum empowers students, educators, and lifelong learners by combining flashcards and summarization tools.
- Built with Flutter, Django, and Python's NLTK for interactive, automated study support.
- Simplifies learning by reducing the need for manual prep, enhancing focus on retention and comprehension.
- Includes features like customizable flashcards, multilingual support, and MCQs for practice.

Problem Statement

- Traditional study methods are time-consuming and mentally exhausting, limiting focus and retention.
- Manual flashcard creation, keyword extraction, and MCQ prep reduce study time and increase cognitive fatigue.
- Lack of accessible, multilingual study tools limits opportunities for a diverse global audience.

Objective

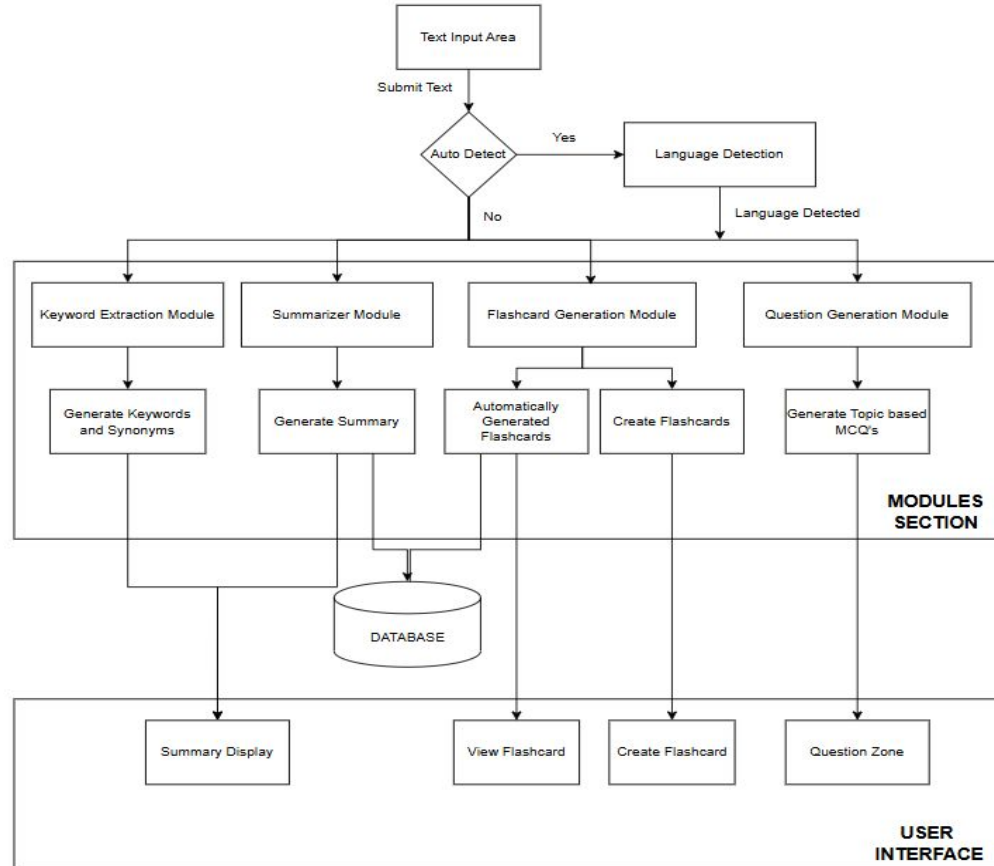
The main goal of our project is to create a seamless platform where users can:

- Generate concise summaries from longer texts.
- Extract keywords and synonyms for better understanding and improve vocabulary.
- Create interactive flashcards which can be customised.
- Generate MCQs for practice.
- Multilingual support
- Enhance understanding and memory retention

Idea

- **Beyond Summarization:** Simple summaries don't fully address student needs.
- **Retention Difficulties:** Summarized information can be easily forgotten.
- **Engaging Study Tools:**
 - **Flashcards:** Automatically created or tailored for personalized learning.
 - **MCQs:** Assess knowledge after each topic for better retention.
- **Inclusive Access:** Supports multiple languages for broader user reach.
- **Efficient Learning:** Summaries and keywords enhance comprehension and speed up study sessions.

System Architecture



Detailed Design

Summarization Module:

- User enters any text.
- **NLP** techniques (tokenization, POS tagging, NER) with **spaCy** and **nlTK** break down the content.
- **KeyBERT** helps pick out key points to generate a flashcard.
- It also finds synonyms for better understanding.

Keyword Extraction Module:

- Using the summarized text generated.
- **KeyBERT** extracts main keywords.
- List of important keywords and related terms.

Detailed Design

Flashcard Generation Module:

- Using the summarized text
- Use **KeyBert** with conjunction with **OpenAI's API** to generate keywords and generate flashcards for each keyword
- Store the flashcards in the database
- View and edit the flashcards as needed.

Question Generation Module:

- The system takes the summarized text and uses OpenAI's API to create multiple-choice questions (MCQs) based on the summary.
- Each question is generated in the language of the text and stored in the database.
- The questions can be viewed or customized by the user for self-testing.

Detailed Design

Language Detection Module:

- The user enters any text.
- The system uses a dataset to find patterns and match the language.
- A pre-trained model identifies the language accurately.
- Based on the detected language, the system processes summarization, flashcards, and questions.
- The system supports three languages using the dataset and model.

User Interface (UI):

- **Built using:** Flutter and Dart for a smooth, cross-platform experience.
- **Features:**
 - Upload text, view summaries, generate flashcards.
 - Users can edit, modify, and save flashcards.
 - Keywords are shown with the summary to highlight key ideas.
- **Interactive Experience:** Easy-to-use interface to manage flashcards and content.

Detailed Design

DATABASE MODELS

Flashcard Model:

- Stores flashcards made by each user which they can view and edit..

Post Model

- Contains the summaries generated by the summarizer for each user.

Profile Model

- Keeps information about users, like their profile picture.

Tools and Technologies Used

Frontend: Flutter

Backend: Django

API: OpenAI's API

Python Libraries: spaCy, KeyBERT

Natural Language Processing: Python NLTK

Database: PostgreSQL (or SQLite for simplicity)

Development Environment: Visual Studio Code

Screenshots of the output

CardSum


Current User: summerProjTest12


Login/Register


Toolkit Page


Logout


Homepage




 View Cards

 Edit Cards

 Summarize Text

 Create Flashcard

 Question Zone

Climate change threatens people with increased flooding, extreme heat, increased food and water scarcity, more disease, and economic loss. Human migration and conflict can also be a result.[13] The World Health Organization calls climate change one of the biggest threats to global health in the 21st century.[14] Societies and ecosystems will experience more severe risks without action to limit warming.[15] Adapting to climate change through efforts like flood control measures or drought-resistant crops partially reduces climate change risks, although some limits to adaptation have already been reached.[16][17] Poorer communities are responsible for a small share of global emissions, yet have the least ability to adapt and are most vulnerable to climate change.[18][19]





Response

In common usage, climate change describes global warming—the ongoing increase in global average temperature—and its effects on Earth's climate system. These include ocean heating, ocean acidification and sea level rise.[12]

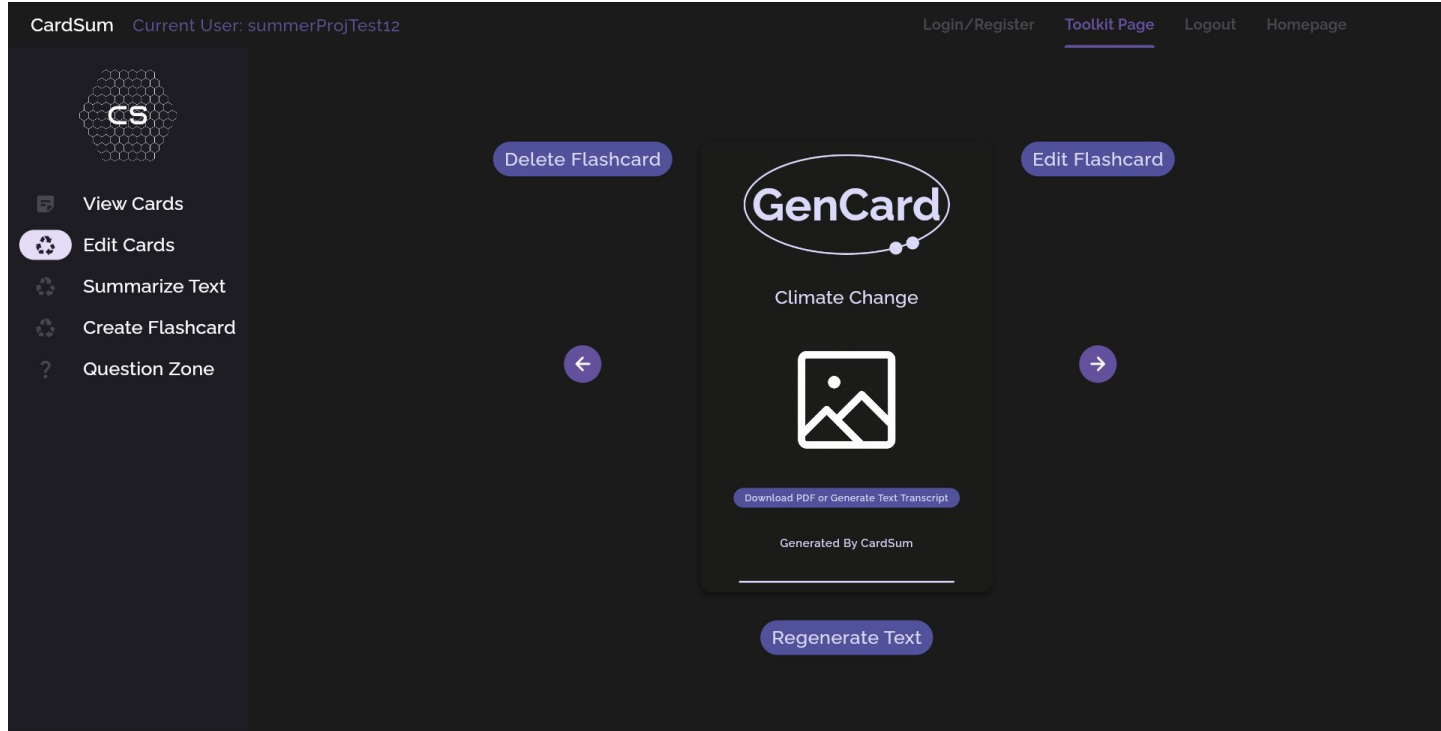
Climate change threatens people with increased flooding, extreme heat, increased food and water scarcity, more disease, and economic loss. Climate change in a broader sense also includes previous long-term changes to Earth's climate. Poorer communities are responsible for a small share of global emissions, yet have the least ability to adapt and are most vulnerable to climate change.[18][19] Deserts are expanding, while heat waves and wildfires are becoming more common.[7][8] Amplified warming in the Arctic has contributed to thawing permafrost, retreat of glaciers and sea ice decline.[9] These gases absorb some of the heat that the Earth radiates after it warms from sunlight, warming the lower atmosphere.

English

Enter your message here



Screenshots of the output



Screenshots of the output

CardSum


Current User: summerProjTest12


Login/Register


Toolkit Page


Logout


Homepage




View Cards

Edit Cards

Summarize Text

Create Flashcard

Question Zone

Enter Flashcard Details Here

Title

Topic

Text

Submit

Screenshots of the output

CardSum


Current User: summerProjTest12

Login/Register

Toolkit Page

Logout

Homepage



View Cards

Edit Cards

Summarize Text

Create Flashcard

?

Question Zone

Enter text

e et frère, donc même un gardien ivre était une sécurité suffisante. De plus, elle n'était ni assez forte ni assez agile pour s'évader.

Generate Questions

Pourquoi Henriette était-elle en prison selon le texte?

☐ A) Pour avoir volé de la nourriture

☐ B) Pour avoir agressé un garde

☒ C) Pour avoir joué l'ancien Hymne National en public

☐ D) Pour avoir tenté de s'évader

Submit

Correct!

Comment les gardiens ont-ils réagi à la musique d'Henriette?

Number of correct answers: 2 / 5

Results and Discussions

- **Summarization:** Successfully converts text into a condensed form.
- **Keyword Extraction:**
 - Extracts important keywords from the text.
 - Provides a variety of synonyms for enhanced understanding.
- **Flashcard Generation:** Creates flashcards with relevant topics and summaries.
- **Question Generation:** Generates multiple-choice questions (MCQs) to encourage self-learning.
- **Multi-Language Support:**
 - Currently facilitates features in 3 languages.
 - Future plans to expand to worldwide and regional languages for inclusivity.
- **Time Efficiency:**
 - Studies suggest that summarizers save around 30% to 80% of study time.
 - CardSum is estimated to save approximately 50% to 90% of study time with its comprehensive features.