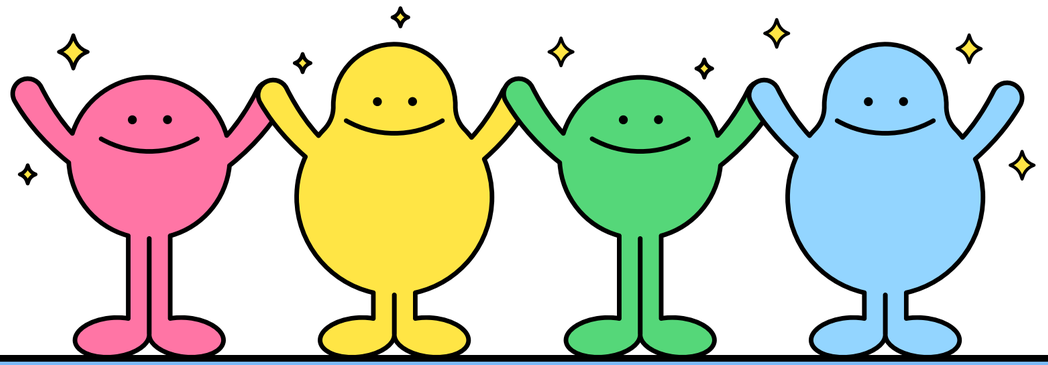
Learning English Vocabulary by Camera

Chalkak



21102042 Seungwoo Baik
21102052 Jeongyun Lee
21102043 Suyong Sim

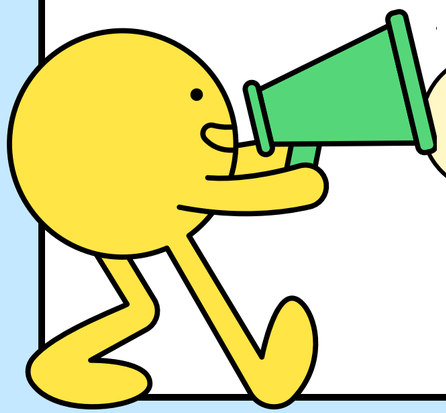
Contents

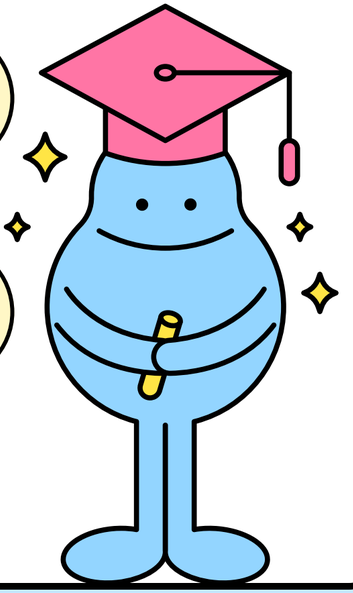
Concept

Kid-friendly UI/UX for better engagement

Learning English words through pictures

Learn anytime, anywhere using smartphones





Main functionalities

Login / Register

Implemented a user registration and login system using Google Firebase and OAuth 2.0 to minimize security concerns.

Photo Upload

Users can learn English vocabulary based on the content of photos they take with their camera or upload from their photo album.

Main functionalities

Object recognition (in images)

Technology: Object detection is implemented using the EfficientDet-Lite0 model from TensorFlow Lite.

Dataset: The model is trained on the large-scale **COCO dataset**, ensuring robust recognition across **80 common object categories**.

Users can take or upload a photo, and the application will automatically detect objects, using their English labels as the basis for a vocabulary lesson.

Main functionalities

Word pronunciation feature (TTS)

The object names extracted by the COCO model are received as strings and converted into speech using **Android's Text-To-Speech (TTS) API**.

The **TTS engine** produces natural pronunciation, enabling children to intuitively learn how words are spoken.

Additionally, **voice caching** for each word can be implemented to minimize latency during repeated playback.

Main functionalities

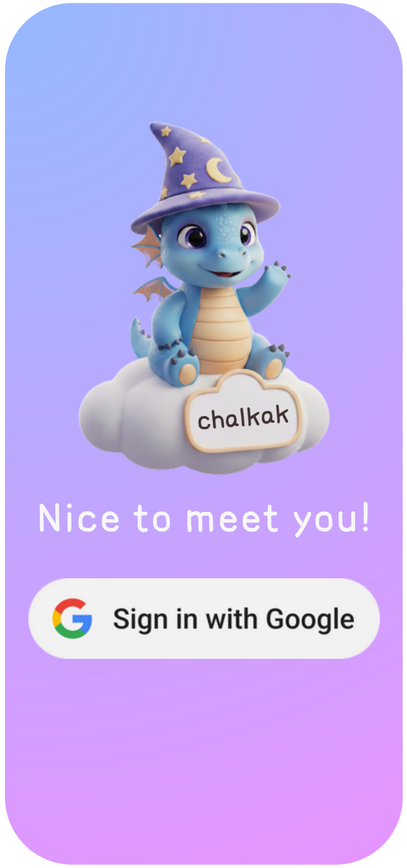
Learning Log-Based Review and Push Notification

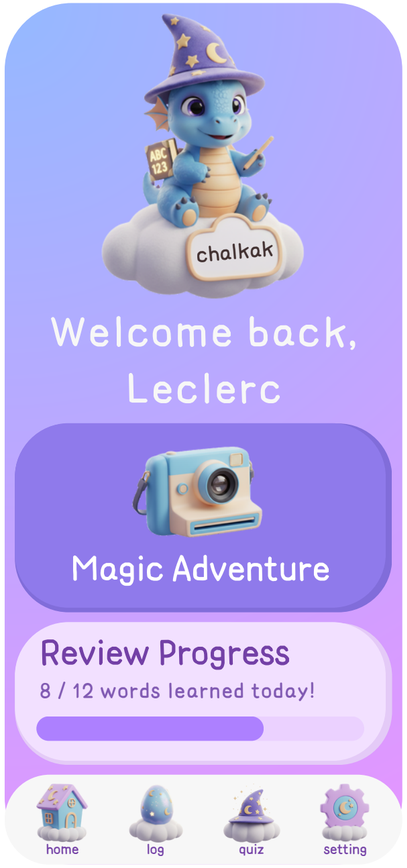
We built a real-time **NoSQL database** based on **Google Firebase** to track learning progress and suggest word reviews using a spaced repetition algorithm.

Learning logs are stored per word, allowing users to review images mapped to the word.

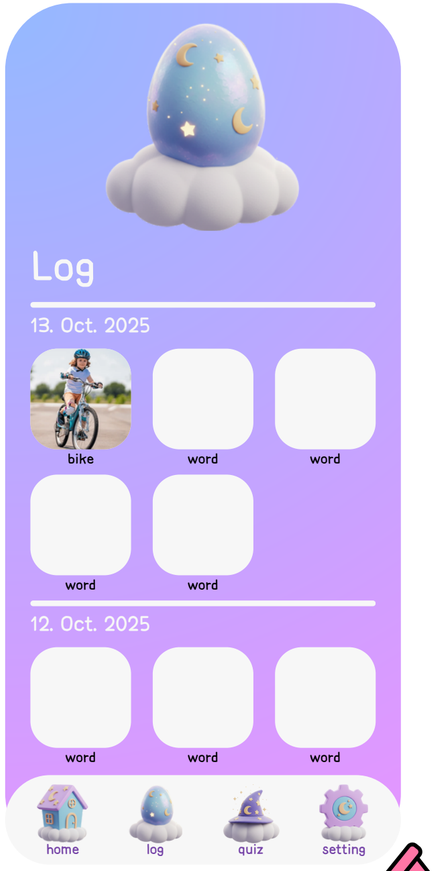
To encourage consistent English learning, **push notifications** are sent when users are inactive for a long period or have not completed their reviews.

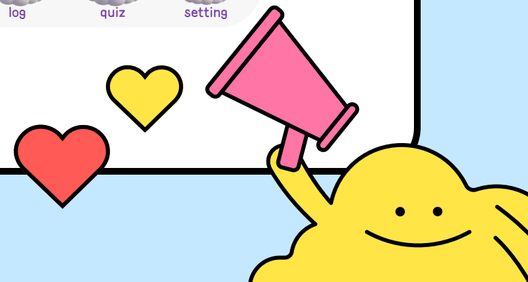
UI


chalkak
Nice to meet you!
Sign in with Google


chalkak
Welcome back, Leclerc
Magic Adventure
Review Progress
8 / 12 words learned today!
home
log
quiz
setting


Magic Adventure
Let's Learn English Words!
Take Photo
Upload from Gallery
home
log
quiz
setting

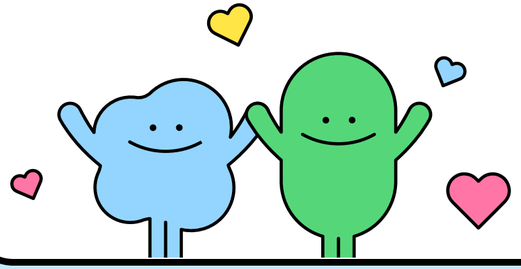

Log
13. Oct. 2025
bike
word
word
word
word
12. Oct. 2025
word
word
word
home
log
quiz
setting

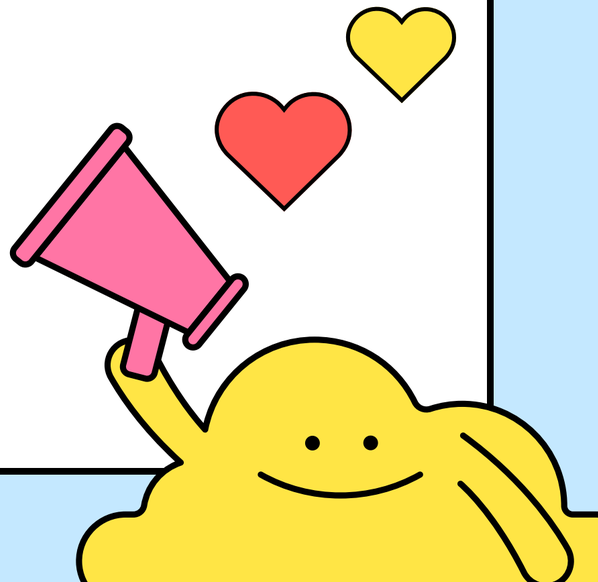


UI


Magic Adventure


Magic Adventure
Pencils
Coffee
Glasses
Memo
Glasses 안경
He wears glasses.
Notebook





UI

Magic Adventure

⚠ We cannot detect any objects

Insert the words, directly.

hammer

Next!

home log quiz setting

Review Progress

5 / 12 words today!

Glasses
안경

Coffee
커피

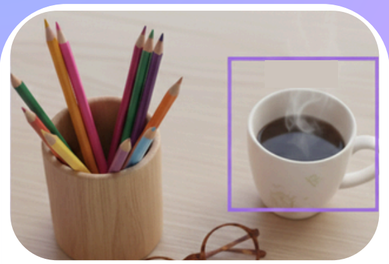
Pencil
연필

Notebook
공책

home log quiz setting

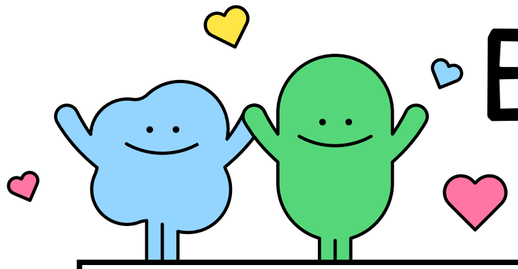
Magic Adventure

Quiz: 1 / 5

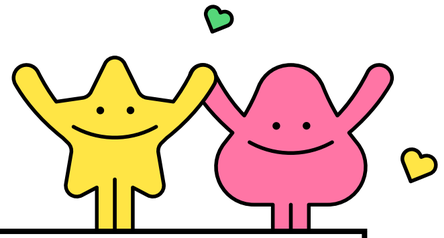


1. Notebook
2. Pencil
3. Coffee
4. Hammer

home log quiz setting

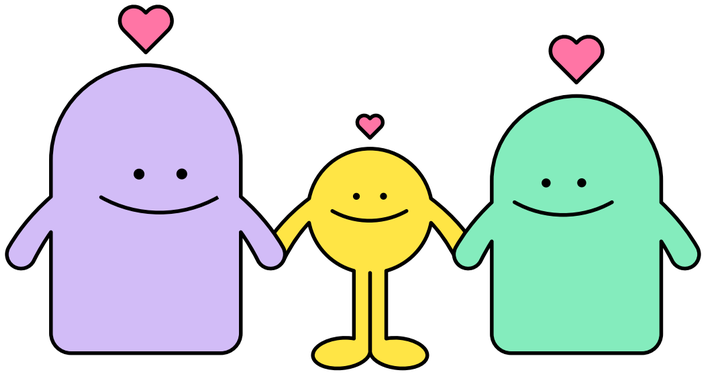


Expected Timeframe



Phase	Main Goal	Details
Phase 1 (W2 Oct. - W5 Oct.)	Design UI/UX & Functionalities	Making cute interface and character
Phase 2 (W1 Nov. - W3 Nov.)	Implementing main features	Develop loigin/register, photo upload, object recognition, and TTS function.
Phase 3 (W4 Nov. - W1 Dec.)	Implementing additional features	Add review quiz, learning log, and push notification.
Phase 4 (W2 Dec.)	Test for Deployment & Presentation	Integrate all functions, fix bugs, and prepare final demo.

Role & Responsibility



Baik Seungwoo: Object Recognition function & UI design
Sim Suyong: Building No-SQL DB with Google Firebase
Lee Jeongyun: Implementing Authentication & Learning feature

Thank you
for listening

TEAM Chalkak