Near Synonyms: High Level Design

Team Information

Team: Synonym Masters

Members: Itay riche, Yarden Gal Tahor, Yarin Ben-Zimra, Shay Bar, Guy Binyamin

System's Main Components

User Interface (UI):

Built with React, allowing users to interact with the system.

Backend Server:

Node.js for handling requests and business logic.

Database:

AWS database for storing sentences, synonyms, and user responses.

NLP Models:

Trained in Python, responsible for determining the appropriateness of synonyms.

Main Users' Use Cases

Persona: Language Learner

1. Login: The user logs into the application.

2. Quiz Start: The user starts a synonym quiz.

3. Question Display: A sentence with a missing word and two synonyms are displayed.

4. Answer Selection: The user selects the synonym they believe is most appropriate.

5. Feedback: The application provides feedback on the choice.

6. Result Storage: The user's answer is stored in the database for further analysis.

Front End Technology

Technology: React Native

Architecture: Component-based, with a Node.js backend for server-side logic.

Mocks for Main Pages

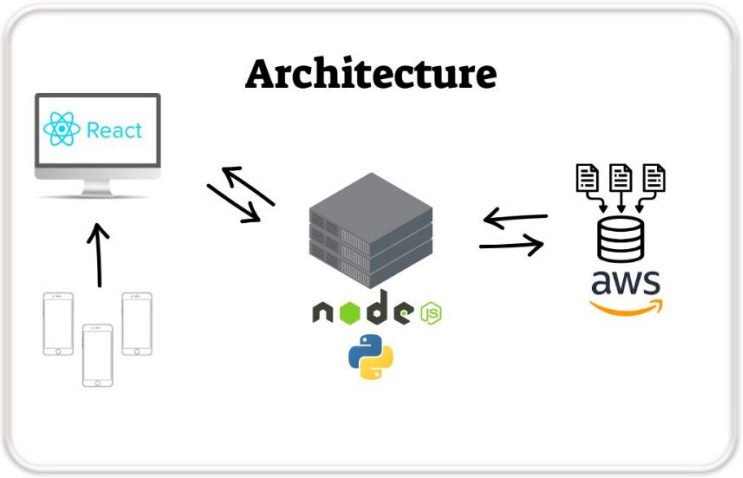
Login Page: Simple interface for user authentication.

Dashboard: Overview of the user's progress and options to start new quizzes.

Quiz Page: Displays sentences with missing words and synonym options.

Feedback Page: Shows correct answers and explanations.

System Architecture Overview



Component Breakdown

UI (React): Interactive components for user interaction. Communicates with the backend via RESTful APIs.

Backend (Node.js): Handles requests from the UI. Interfaces with the database and NLP models.

Database (AWS): Stores sentences, synonyms, and user responses. Ensures data integrity and availability.

NLP Models (Python): Trained on large datasets to evaluate synonym appropriateness. Integrated with the backend to provide real-time analysis.

Data Model and Storage

Data Schema:

Tables:

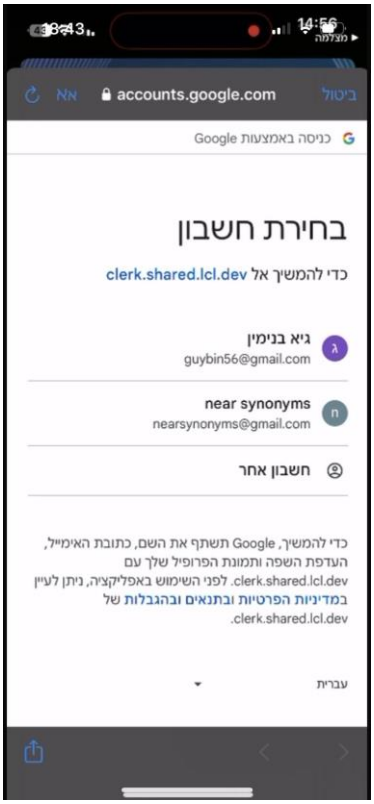
- Sentences: Stores sentence structures and missing words.
- Synonyms: Stores synonyms and their relationships.
- User Responses: Records user answers and timestamps.
- Storage: Hosted on AWS for scalability and reliability.

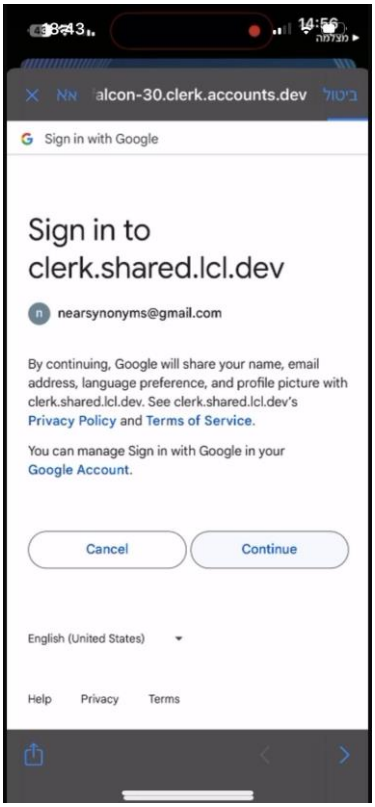
User Interface Design

Design Principles: User-friendly, intuitive, and responsive design.

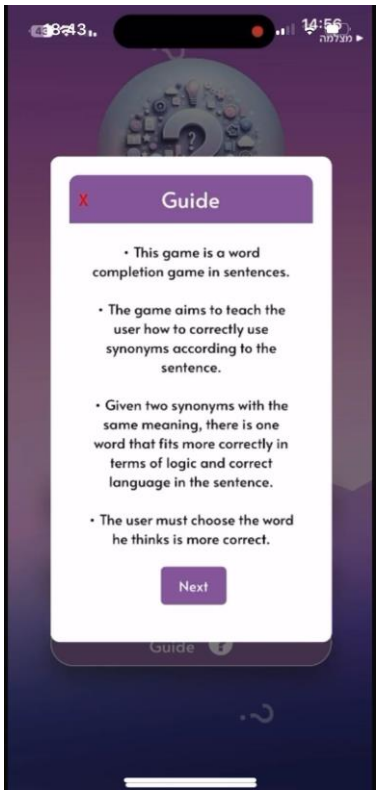
Consistent look and feel across all pages.

Mockups: High-level sketches of the main screens, focusing on usability.

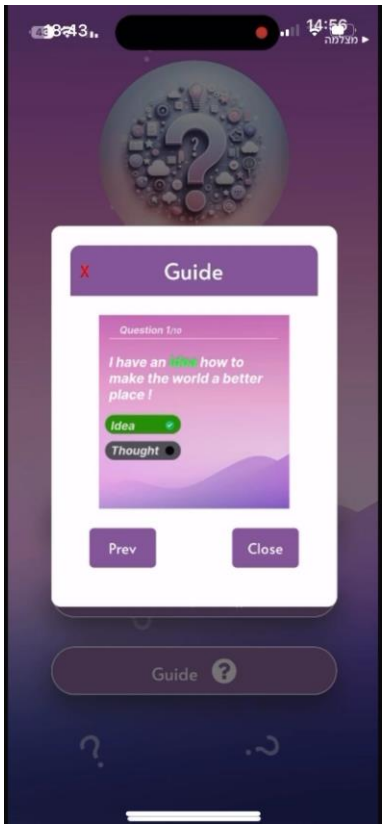




SYNONYMS
GAME
Play
Settings
Guide


Guide
• This game is a word completion game in sentences.
• The game aims to teach the user how to correctly use synonyms according to the sentence.
• Given two synonyms with the same meaning, there is one word that fits more correctly in terms of logic and correct language in the sentence.
• The user must choose the word he thinks is more correct.
Next

Guide
Question 1/10
I have an _____ how to make the world a better place !
Idea
Thought
Prev
Next
Guide


Guide
Question 1/10
I have an idea how to make the world a better place !
Idea
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Prev
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Guide

27
Question 1/10
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Question 1/10
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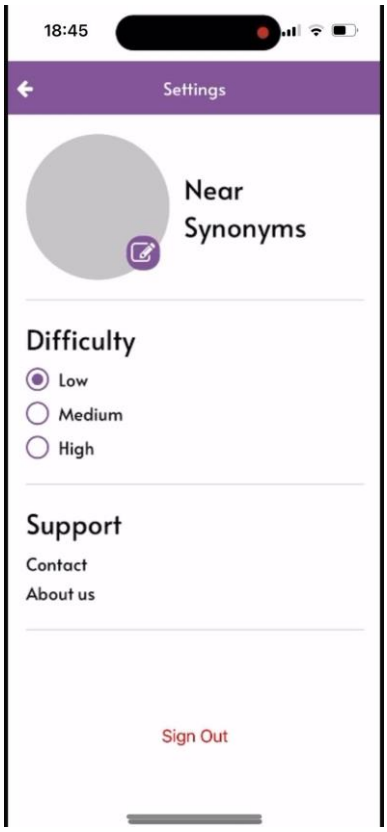
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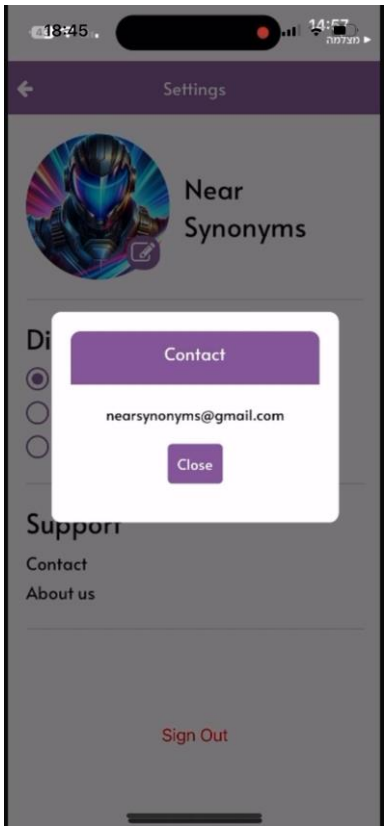
Synonyms
Difficulty
Low
Medium
High
Support
Contact
About us
Sign Out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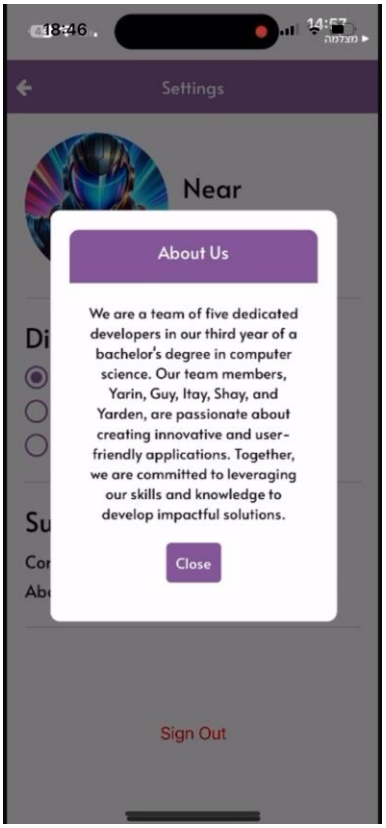
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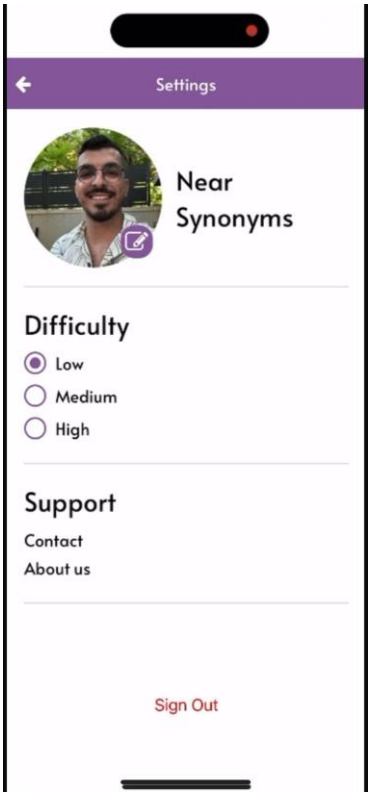
Settings
Near
About Us
We are a team of five dedicated developers in our third year of a bachelor's degree in computer science. Our team members, Yarin, Guy, Itay, Shay, and Yarden, are passionate about creating innovative and user-friendly applications. Together, we are committed to leveraging our skills and knowledge to develop impactful solutions.
Close
Sign Out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Integration Strategy

Approach: RESTful APIs for communication between frontend and backend.
Secure connections to the AWS database.

Protocols: HTTPS for secure data transmission. JSON format for data exchange.

Security Measures

Protocols: SSL/TLS for secure data transmission.
User authentication and authorization mechanisms.

Data Privacy: Data encryption at rest and in transit. Regular security audits and updates.

Scalability and Performance

Considerations: Load balancing and auto-scaling on AWS.
Optimized database queries and indexing.

Strategies: Caching frequently accessed data. Asynchronous processing for heavy tasks.

Error Handling and Recovery

Plan: Centralized error logging and monitoring. Automated recovery scripts for common issues.

Procedures: Regular backups and data recovery drills.

Deployment Strategy

Environment: Hosted on AWS cloud.

Steps: Continuous Integration and Continuous Deployment (CI/CD) pipeline. Automated tests and deployment scripts.

Testing and Quality Assurance

Methodologies: Unit, integration, and end-to-end testing. Code reviews and static analysis.

Environments: Staging and production environments for thorough testing.

Maintenance and Support

Plan: Regular updates and patch management.

Procedures: Bug tracking and resolution. Feature enhancement based on user feedback.

Performance Metrics and Monitoring

Metrics: Response time, error rates, and user engagement.

Monitoring Tools: AWS CloudWatch, application performance monitoring (APM) tools.

Regulatory and Compliance Considerations

Compliance: GDPR, CCPA, and other relevant data protection laws.

Alignment: Regular compliance checks and documentation.

Dependencies and External Services

List: Third-party NLP libraries, React Native and Node.js packages, AWS services.