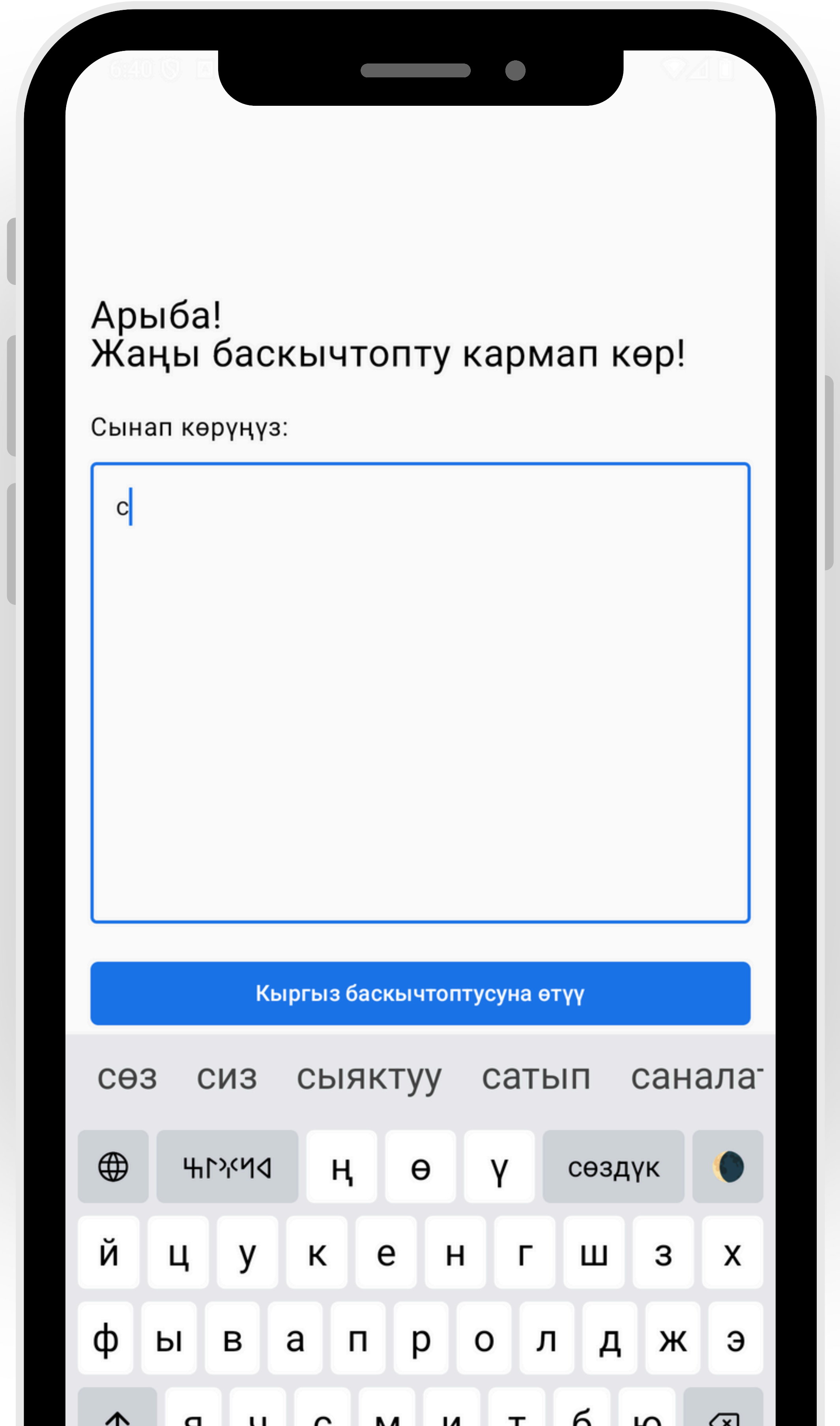
Kyrgyz **Keyboard**

Team Members:

Ademi Abdykerimova
Nikita Paniukhin
Pavel Boubel

Mentor:

Ivan Komarov



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Жаңы баскычтопту кармап көр!

Сынап көрүңүз:

с

Domain Introduction

What is the domain?

Minority-language tools for underserved communities

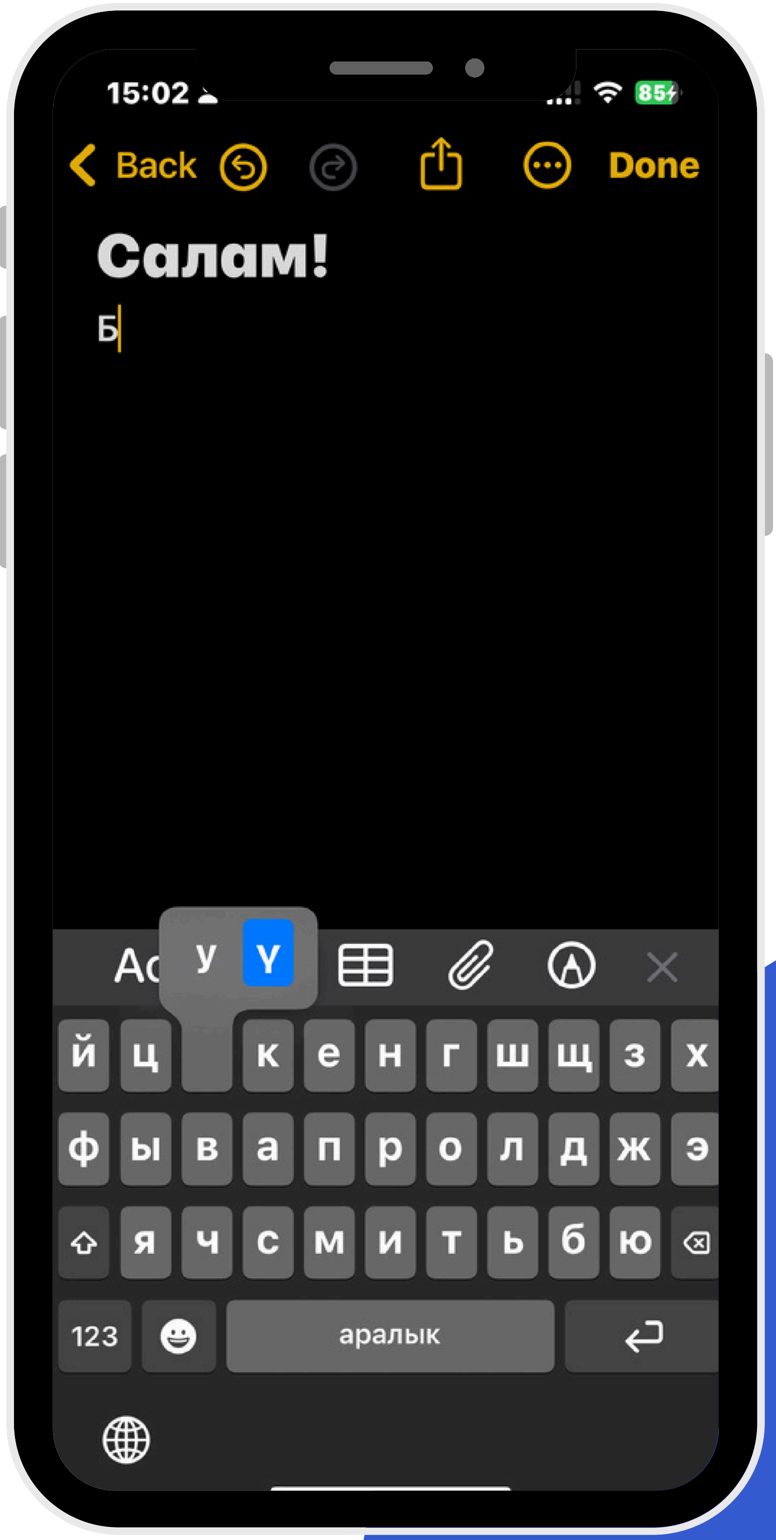
Why is this important?

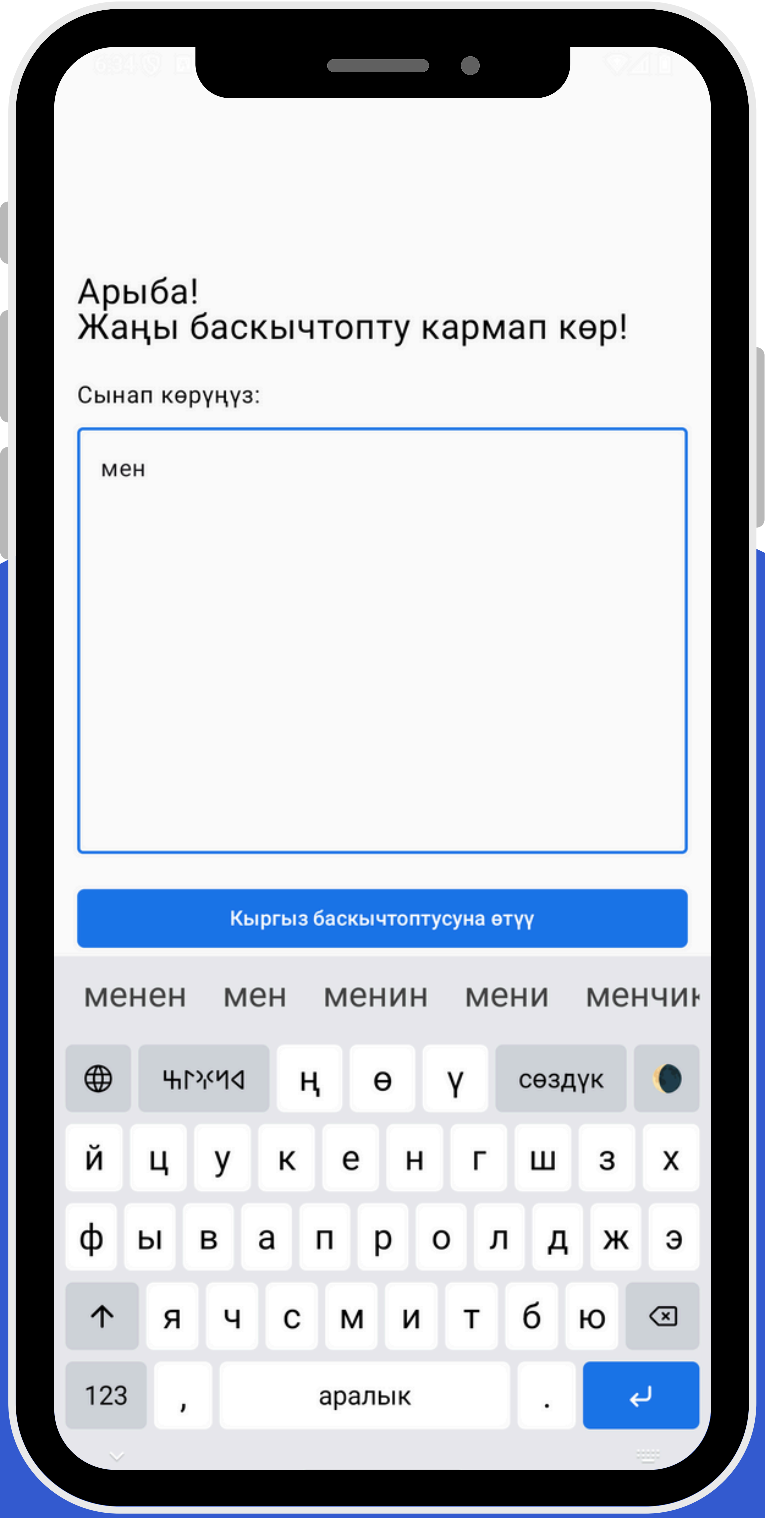
Existing Kyrgyz keyboards lack optimized layouts, predictive text, or script-switching (Cyrillic/Latin)

Who benefits?

Empowers students, elders, professionals to type naturally.
Preserves the Kyrgyz language in the digital space

First open-source keyboard tailored for Kyrgyz

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Сынап көрүңүз:

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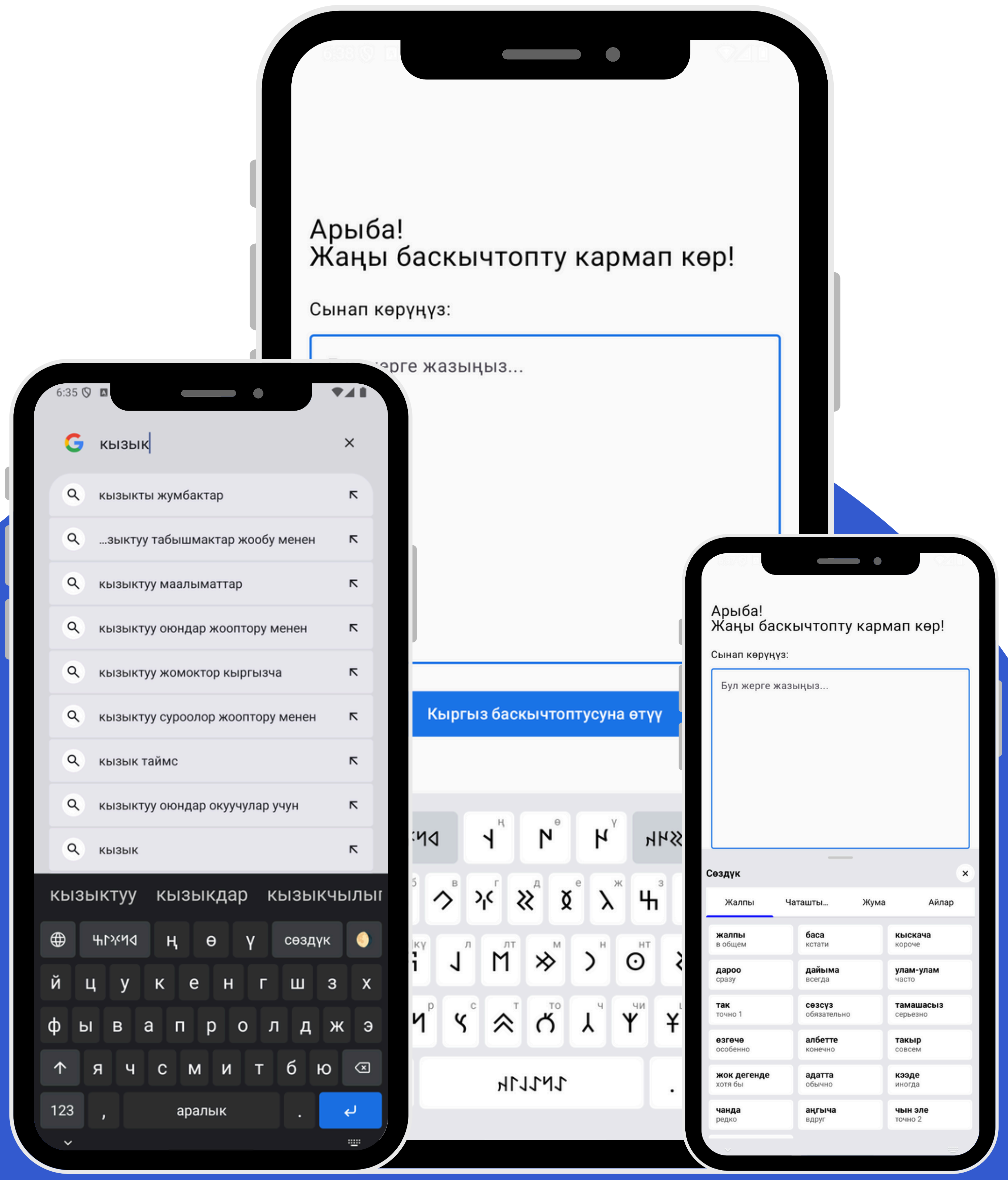
Кыргыз баскычтопсуна өтүү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…ерге жазыңыз...

Кыргыз баскычтопутсуна өтүү

кызыкты жумбактар
…зыктуу табышмактар жообу менен
кызыктуу маалыматтар
кызыктуу оюндар жооптору менен
кызыктуу жомоктор кыргызча
кызыктуу суроолор жооптору менен
кызык таймс
кызыктуу оюндар окуучулар учун
кызык

Бул жерге жазыңыз...

Welcome To Our Application

Bridging digital gaps for Kyrgyz speakers

Optimized Layout

All Kyrgyz letters (ң, ө, ү) accessible without long-press — type faster

Word Predictions

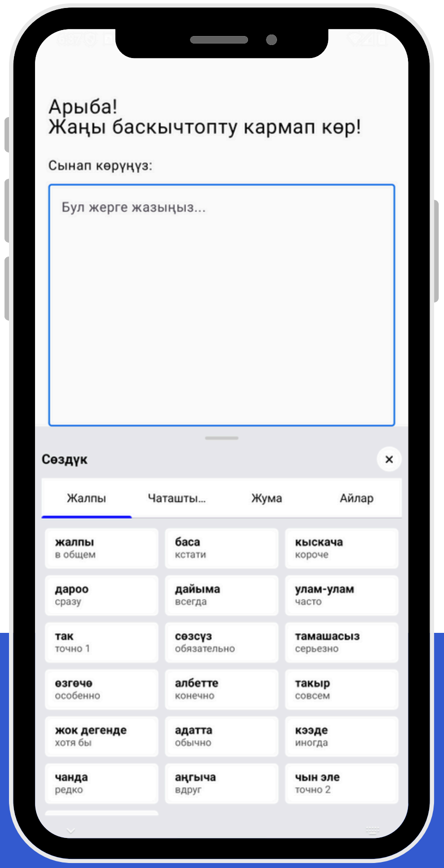
Reduces typos

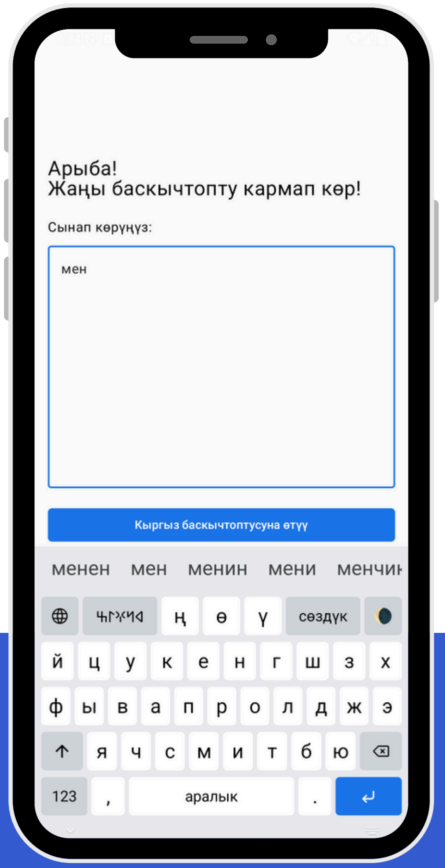
Real-time fixes for agglutinative word forms

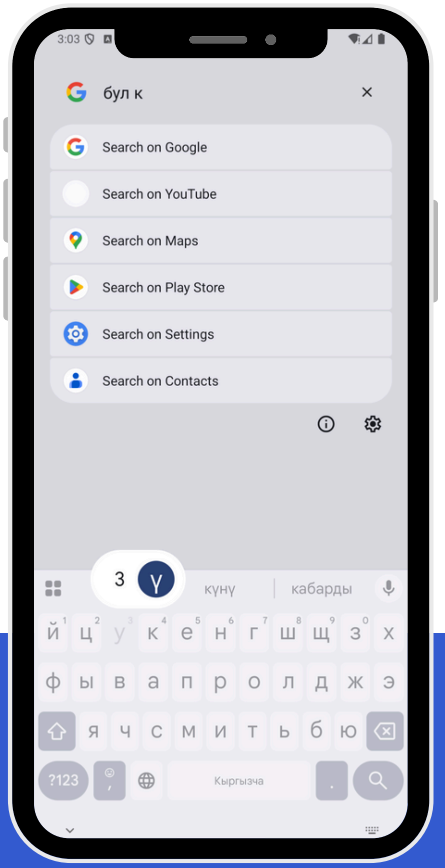
User-Centric Design

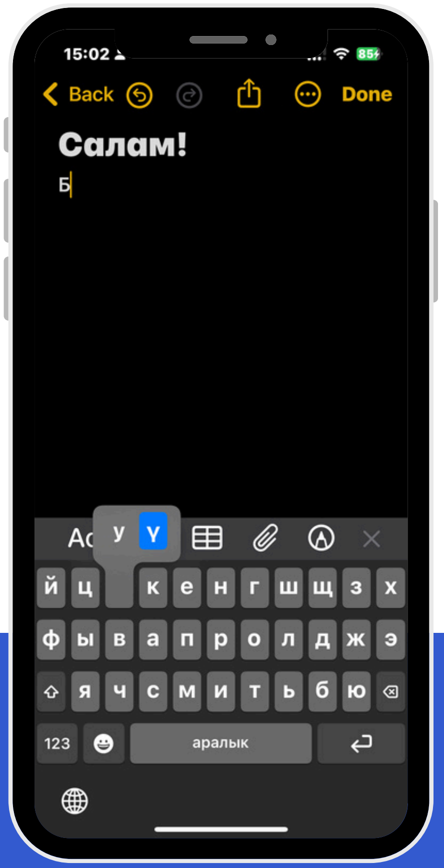
Extra layouts and symbols to encourage engagement

Analogs & Comparison









Features	Our Keyboard	Gboard (Google)	iOS Keyboard	Samsung Keyboard
Kyrgyz Layout	✓ ң ө ү	Long-press	Long-press	Long-press
Predictive Text for Kyrgyz	✓ Statistical model	Limited (basic)	✗	✗
Dialect Support	✓	✗	✗	✗

Technologies used

Kotlin for Android development

Jetpack Compose for modern UI

MVVM architectural pattern

StateFlow for state management

Coroutines for async operations

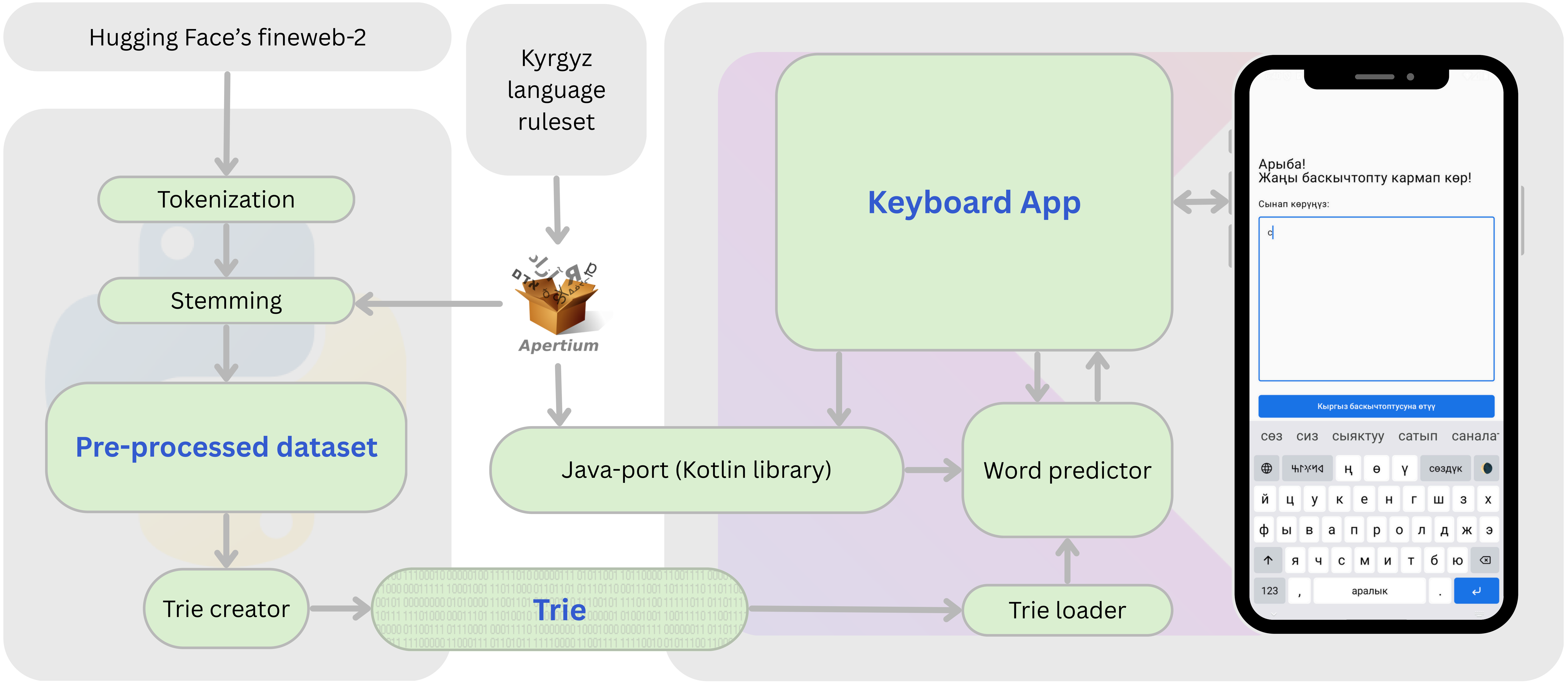
Python for highly parallel data processing

Hugging Face’s **fineweb-2** dataset for Kyrgyz language corpus

Apertium and **Helsinki Finite State Toolkit** for morphological analysis and stemming

Trie structures for faster processing

Architecture

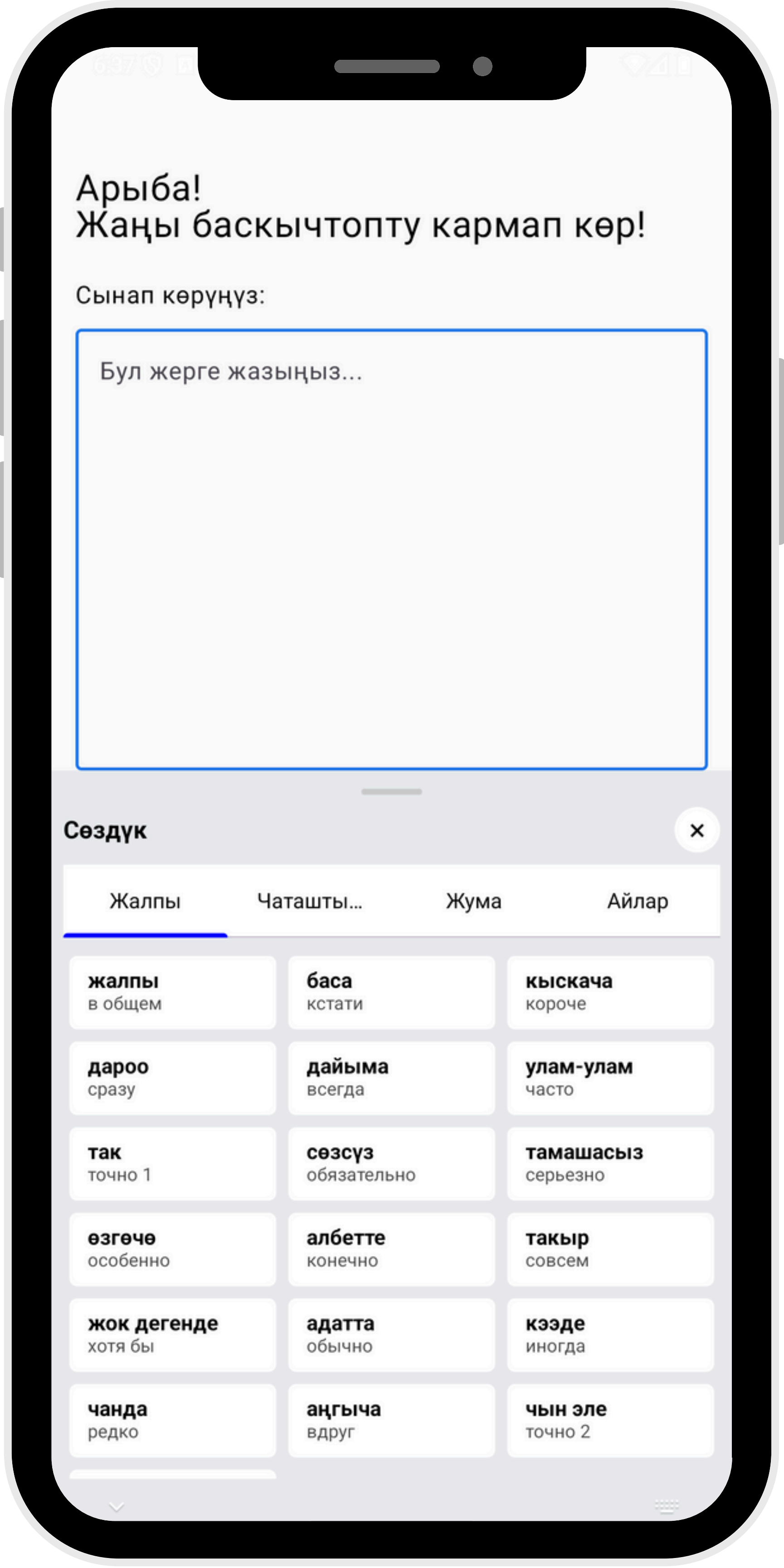


Ademi

Android App Development

Main app UI & Keyboard System

UI with Jetpack Compose
Custom keyboard implementation
Activation & permission flow
System integration & switching
Implemented built-in dictionary



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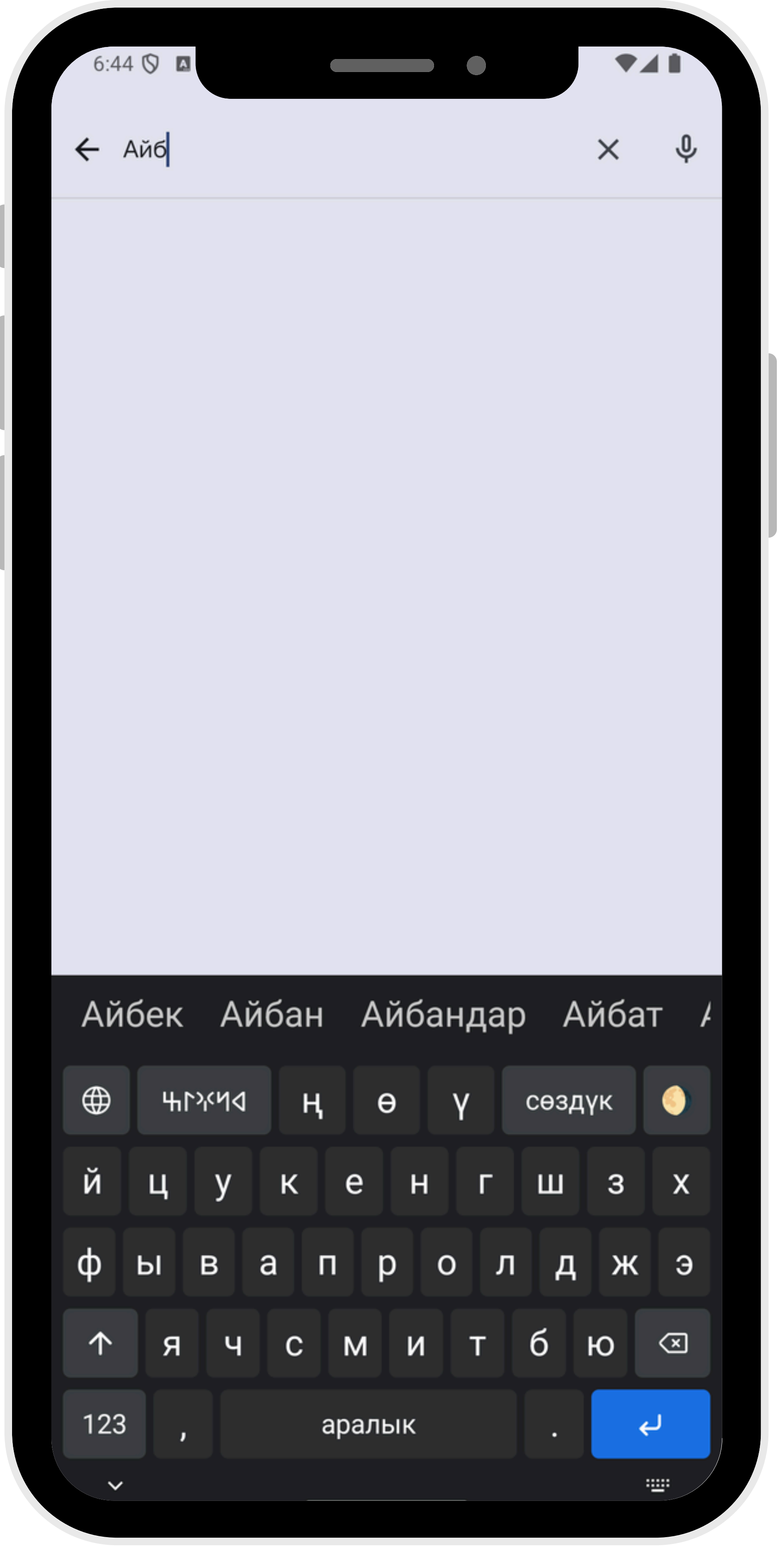
Сынап көрүңүз:

Бул жерге жазыңыз...

Сөздүк

Жалпы | Чаташтыр... | Жума | Айлар

жалпы	в общем
баса	кстати
кыскача	короче
дароо	сразу
дайыма	всегда
улам-улам	часто
так	точно 1
сөзсүз	обязательно
тамашасыз	серьезно
өзгөчө	особенно
албетте	конечно
такыр	совсем
жок дегенде	хотя бы
адатта	обычно
кээде	иногда
чанда	редко
аңгыча	вдруг
чын эле	точно 2



Nikita

Complete Backend Design and Implementation

Pre-processing

Found and tokenized the dataset using a custom-built tokenizer
Created a **huge highly concurrent preprocessing pipeline**

Apertium

Researched Apertium and integrated it into the preprocessing pipeline
Compiled and linked legacy Apertium with Kyrgyz morphological data for use on Java-based platforms

Trie

Designed a binary data structure for efficient word storage and retrieval
Implemented its creation, (de-)serialization, and usage in both Python and Kotlin

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The Invisible Work That Makes It All Possible

Worked A LOT on performance optimization, which resulted in a very high processing speed and a low trie size
Ensured clean and efficient code with manual reviews (supported by CI), automated deployment via CD
Leveraged a high-memory server (>100 GB RAM) to support trie construction

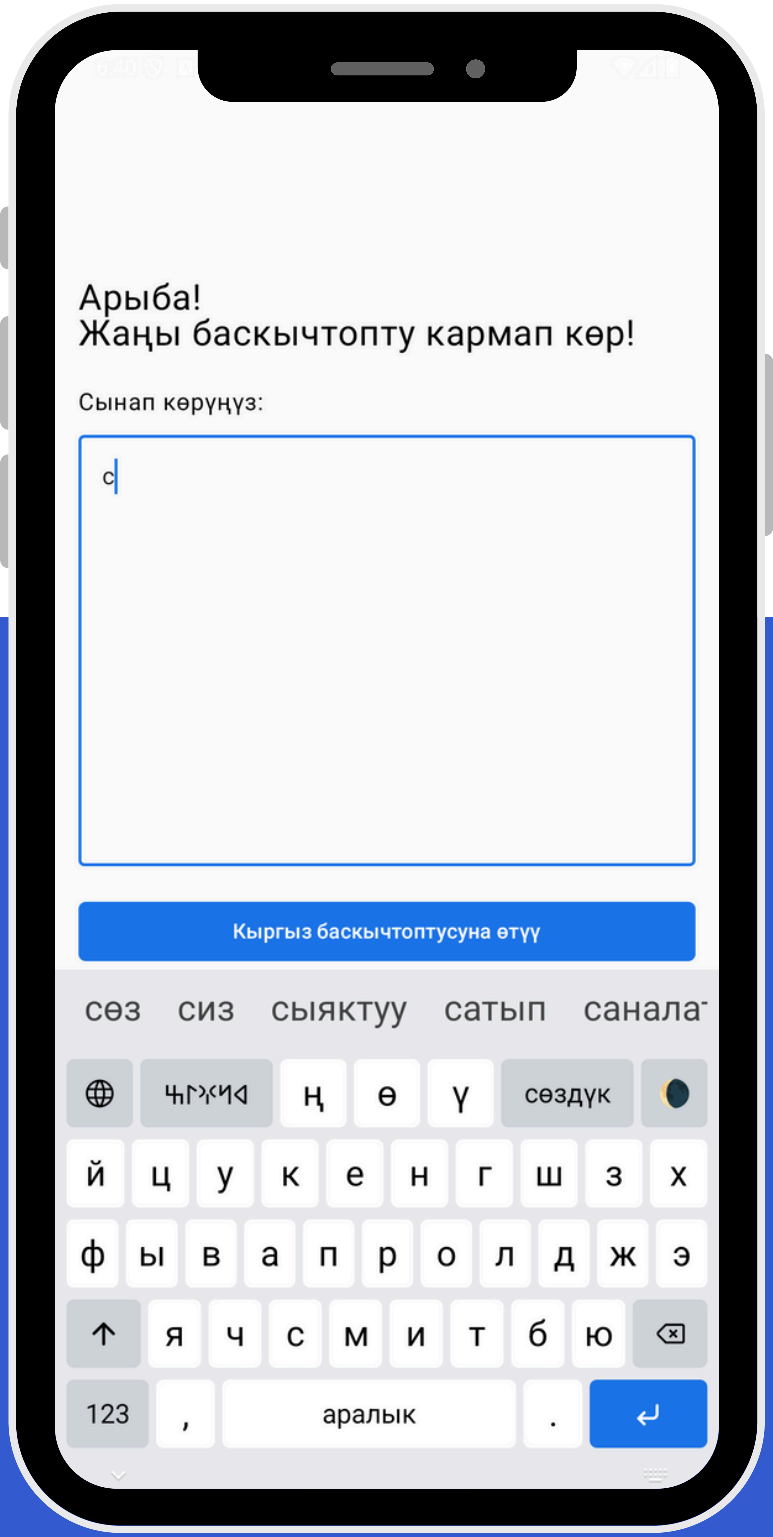
Pavel

Assistance

Valuable feedback

Provided feedback
Participated in weekly meetings
Attempted early versions of trie and trie loader
Tested app for bugs using Android Studio emulator

Screenshots



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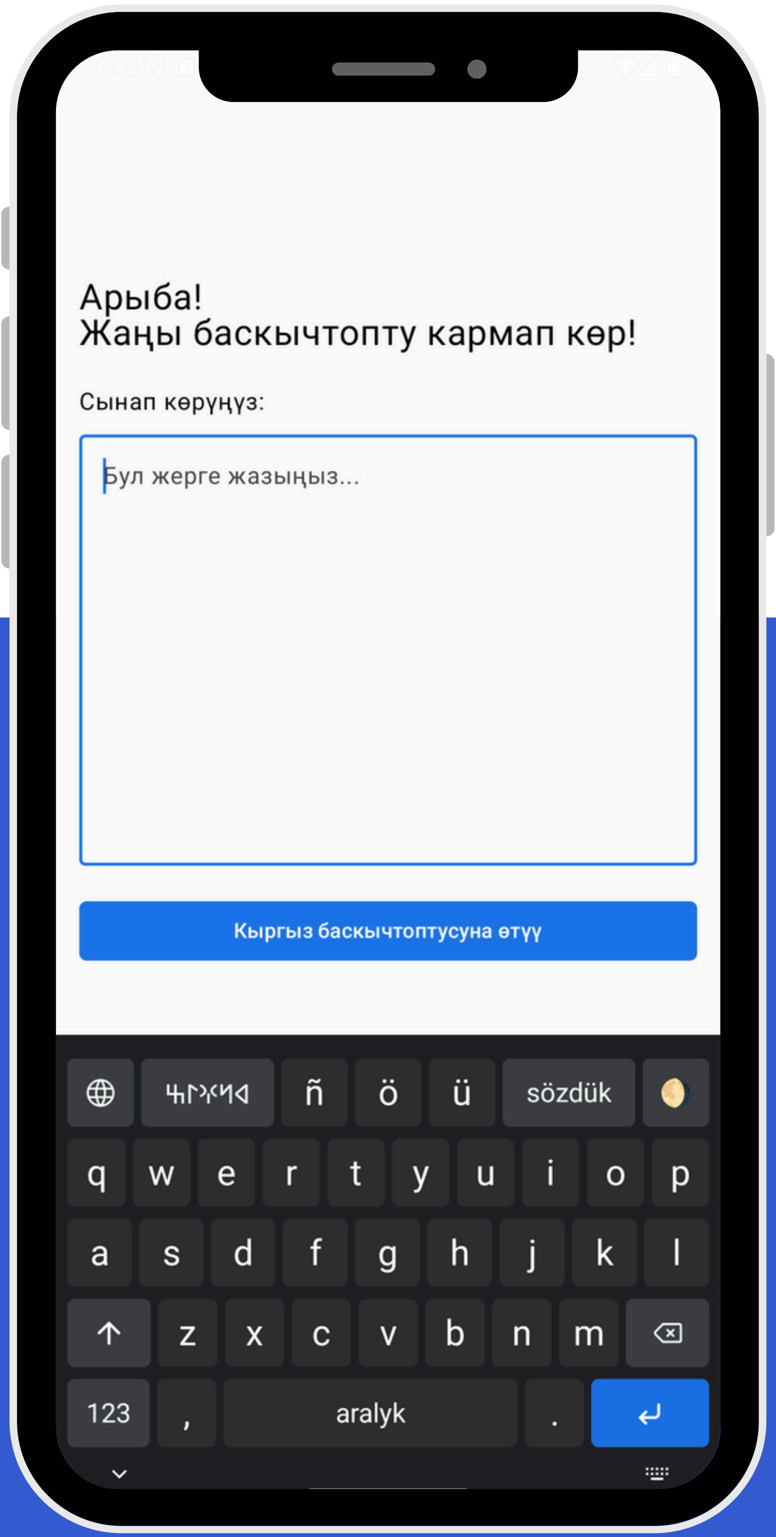

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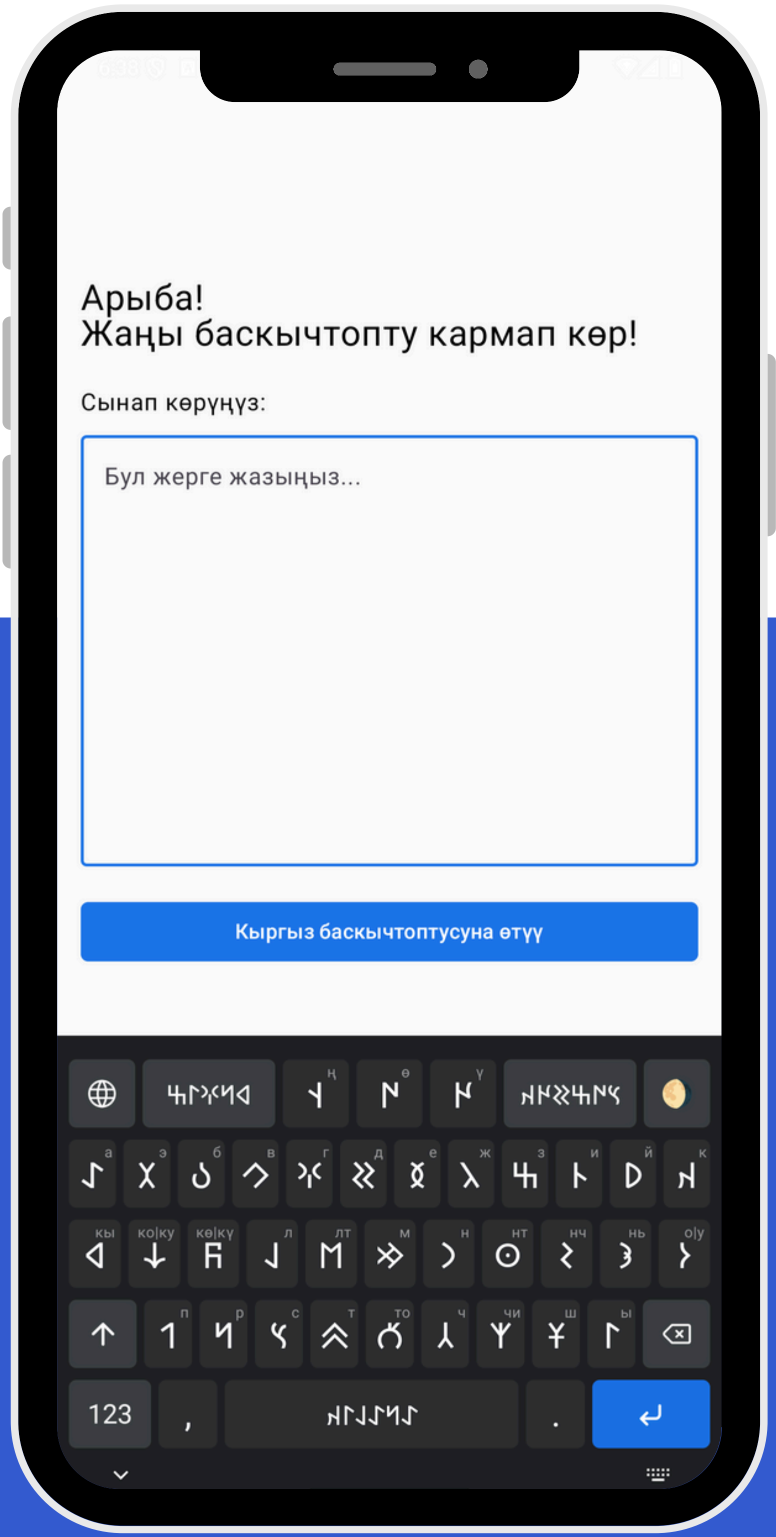
Сынап көрүңүз:

Бул жерге жазыңыз...



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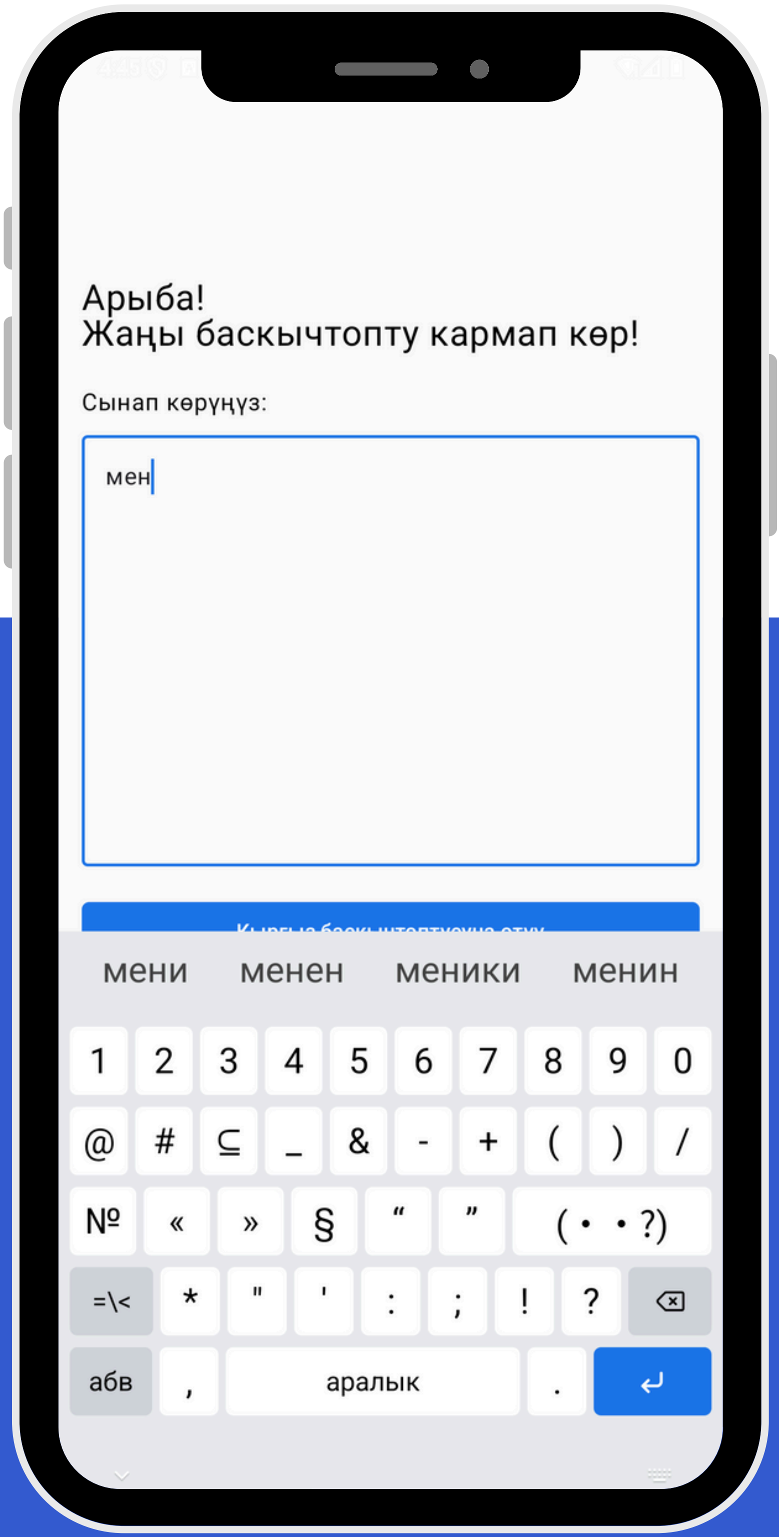

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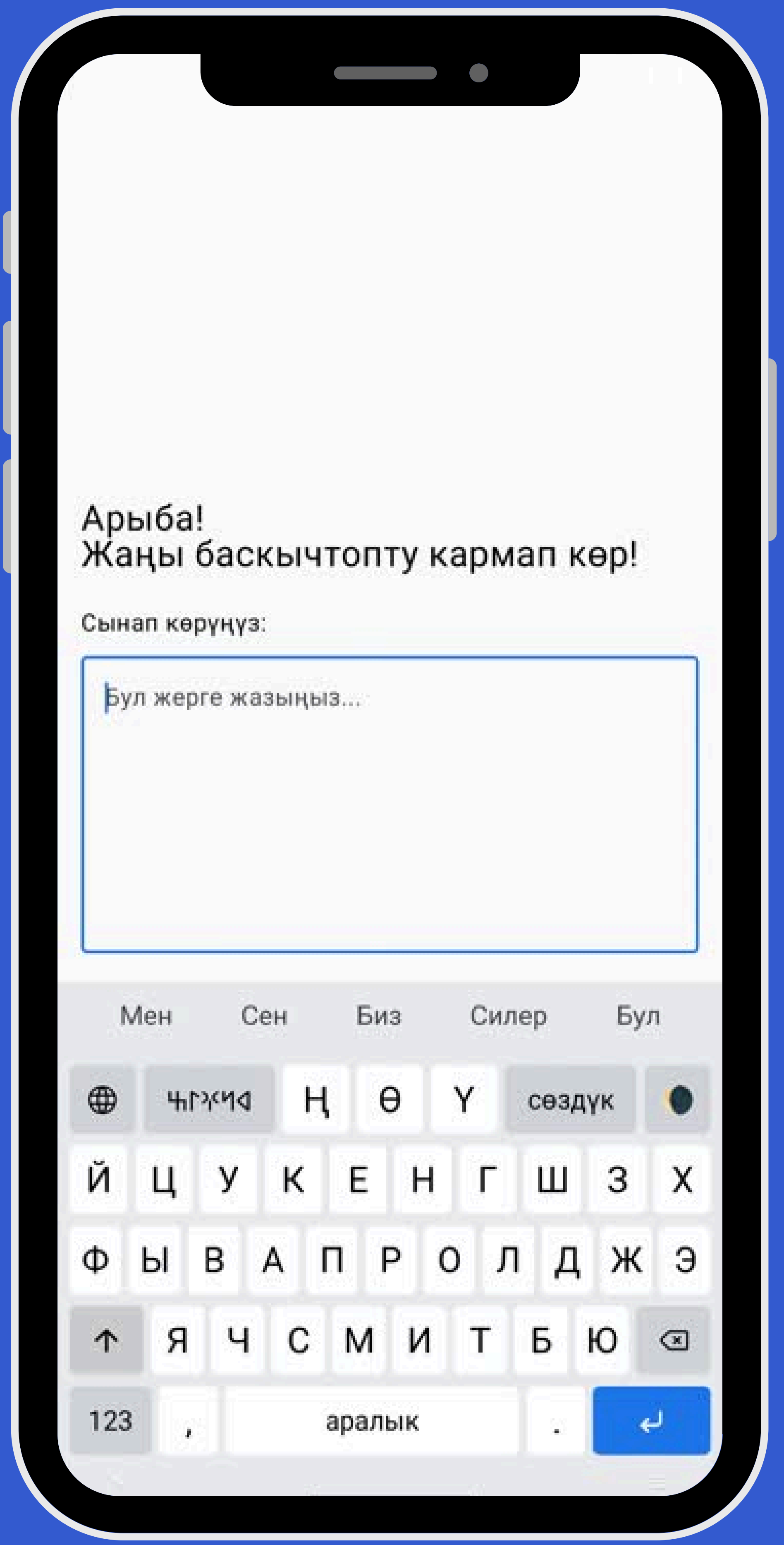
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Demo

https://github.com/Kyrgyz-Keyboard

https://kyr.npanuhin.me/Kyrgyz-Keyboard.apk