Ministry of Education

General Direction of Institutes and Training

PESHANG INSTITUTE – Erbil

Kurdish AI

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In the Partial Fulfillment of the Requirement for the Degree of Diploma of Science Computer Science & IT

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بِسْمِ اللهِ الرَّحْمنِ الرَّحِيم

{ وَأَنزَلَ ٱللَّهُ عَلَيْكَ ٱلْكِتَٰبَ وَٱلْحِكْمَةَ وَعَلَّمَكَ مَا لَمْ تَكُن تَعْلَمُۚ وَكَانَ فَضْلُ ٱللَّهِ عَلَيْكَ عَظِيمًا }

صّدِقُ آللَهّ آلَعُظُيَمً

النساء - الآية 113

Dedication

Dedicated to:

- Our parents who support us till the day we close our eyes.
- Our family members and friends who supported us during good and bad times.
- Full Name our supervisor that guided us from beginning to the end.
- Other Teachers that helped us out when we had unanswered questions.
- Our siblings who always helped and supported us.
- Our classmates who made this journey fun and special.
- The institute staff who gave us what we needed.
- Our mentors who pushed us to do our best.
- The researchers who helped us understand our topic.
- The staff who helped us with paperwork.
- Our colleagues who shared what they knew.
- Everyone who helped us succeed.
- Those who made us think in new ways.
- Future students who will read this work

Certificate

I certify that the project titled "**Kurdish AI"** was done under my supervision at the Computer Science and IT Department, Peshang Institute. In the partial fulfillment of the requirement for the degree of Diploma of Computer Science and IT.

Supervisor

Signature: Awdang Aziz

Name: Awdang Aziz

Date: 13/2/2025

Abstract

The Kurdish AI project helps people talk to computers in Kurdish. It makes it easy for Kurdish speakers to use AI technology in their own language. The system can read and understand Kurdish text, and give helpful answers back in Kurdish. It works on phones and computers, making it simple for anyone to use. The project helps Kurdish students learn, businesses work better, and keeps the Kurdish language strong in the digital world. It can understand different types of Kurdish and learns to give better answers over time. This project brings Kurdish language into modern technology, making sure Kurdish speakers can use digital tools just like any other language. It helps preserve Kurdish culture while making new technology accessible to Kurdish communities everywhere.

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Table Of Abbreviation

Abbreviation	Description
AI	Artificial Intelligence
CSS	Cascading Style Sheet
JS	Java Script
HTML	Hypertext Markup Language
VS Code	Visual Studio Code
API	Application Programming Interface
SSL	Secure Sockets Layer
RDP	Remote Desktop Protocol
RTL	Right To Left
VPS	Virtual Private Server
VENV	Virtual Environment
DB	Database

Chapter One

Introduction

1.1 Introduction

Adding Kurdish language to AI is an important step to help Kurdish speakers use new technology. Our project helps Kurdish speakers by making an AI that can understand and speak Kurdish. Today, we use technology for many things, but Kurdish speakers often can't use many digital tools because they don't work in Kurdish. Our project fixes this by making an AI that works in Kurdish.

When Kurdish speakers can't use technology in their language, they face many problems. Our project helps solve this by making AI work in Kurdish. This means Kurdish speakers can use technology without having to use another language.

- Find information online in Kurdish
- Study in Kurdish
- business in Kurdish
- Use AI tools in Kurdish
- Make Kurdish content

This project doesn't just make a tool - it helps Kurdish speakers be part of the digital world while using their own language. We made the AI learn Kurdish words and rules. It also learns about Kurdish culture to give good answers.

Source taken from: Anthropic Company: https://console.anthropic.com

1.2 Aims & motives

The main goals of this project are:

First time Building an AI system that can read and answer in Kurdish, making it easy for everyone to use Helping Kurdish speakers have the same access to technology as other languages, Making learning easier by providing help in Kurdish, Keeping Kurdish language strong and active in the digital world

Why we are doing this project:

Right now, most AI systems don't work with Kurdish

Schools and students need more digital tools that work in Kurdish

We need to keep Kurdish language alive and growing as technology advances,

Kurdish communities should be able to use modern technology easily.

1.3 Related works

Similar projects that help Kurdish language and technology:

This project involves a chat assistant that can understand and respond in Kurdish language, making AI technology accessible to Kurdish speakers. A similar existing system in this field is Kurd.ai, which was an early pioneer in Kurdish language AI assistance.

The key aspects that make these systems noteworthy for Kurdish language technology:

Natural Language Processing: These systems can process and understand Kurdish text input

Language Generation: They can generate responses in proper Kurdish language

Cultural Context: They understand Kurdish cultural references and context

Local Language Support: They specifically focus on making AI accessible in Kurdish

These systems represent important steps in developing AI technology that serves Kurdish-speaking communities and helps preserve and promote the Kurdish language in the digital age.

These systems represent important steps in developing AI technology that serves Kurdish-speaking communities and helps preserve and promote the Kurdish language in the digital age.

Chapter Two

Methodology

2.1 Hardware requirements

Hardware	Description
Server	• **Processor: Intel Core i7** • **RAM: Minimum 4 GB** • **Storage: 128 GB SSD** • **Shared** • **VPS**
Computer For Development Environment	• **Processor: Intel Core i5 or AMD Ryzen 5 (or better)** • **RAM: Minimum 8GB (16GB recommended)** • **Storage: 256GB SSD or HDD** • **Internet: Stable connection with minimum 10 Mbps speed** • **Display: 1920 x 1080 resolution or higher**

Table 2 Hardware Requirements

2.2 Software requirements

Software	Description
JS	**Programming Language**
React Vite	**Frontend Framework of JavaScript**
Firebase	**DB management**
Python	**Programming Language**
Anthropic API	**API Used to Integrate with Chat Input**
PyCharm	**Integrated Development Environment**
Sonnet	**AI Model Used to Integrate with Chat Box**

Table 3 Software Requirements

2.3 Use case diagram

These features allow users to interact with the chat system, manage their conversations, and choose their preferred language. The interface designed with user-friendliness in mind:

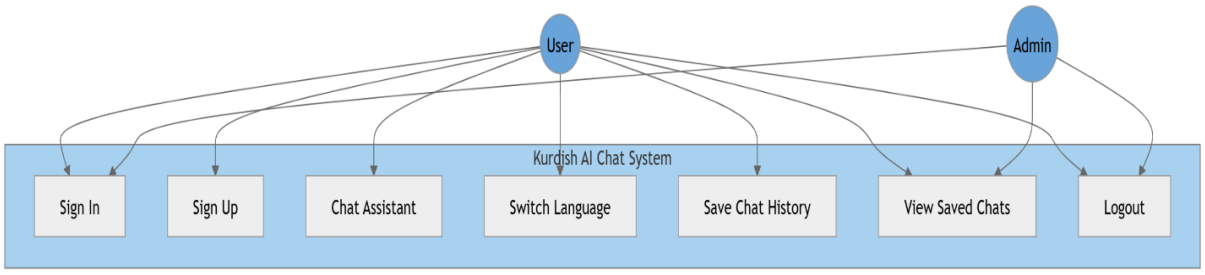


Figure 1 Diagram

1. Sign In
2. Sign Up
3. Chat Assistant
4. Switch Language
5. Save Chat History
6. View Saved Chats
7. Logout

Chapter Three

3.1Analysis and Design

The following figure shows the flowchart of the project:

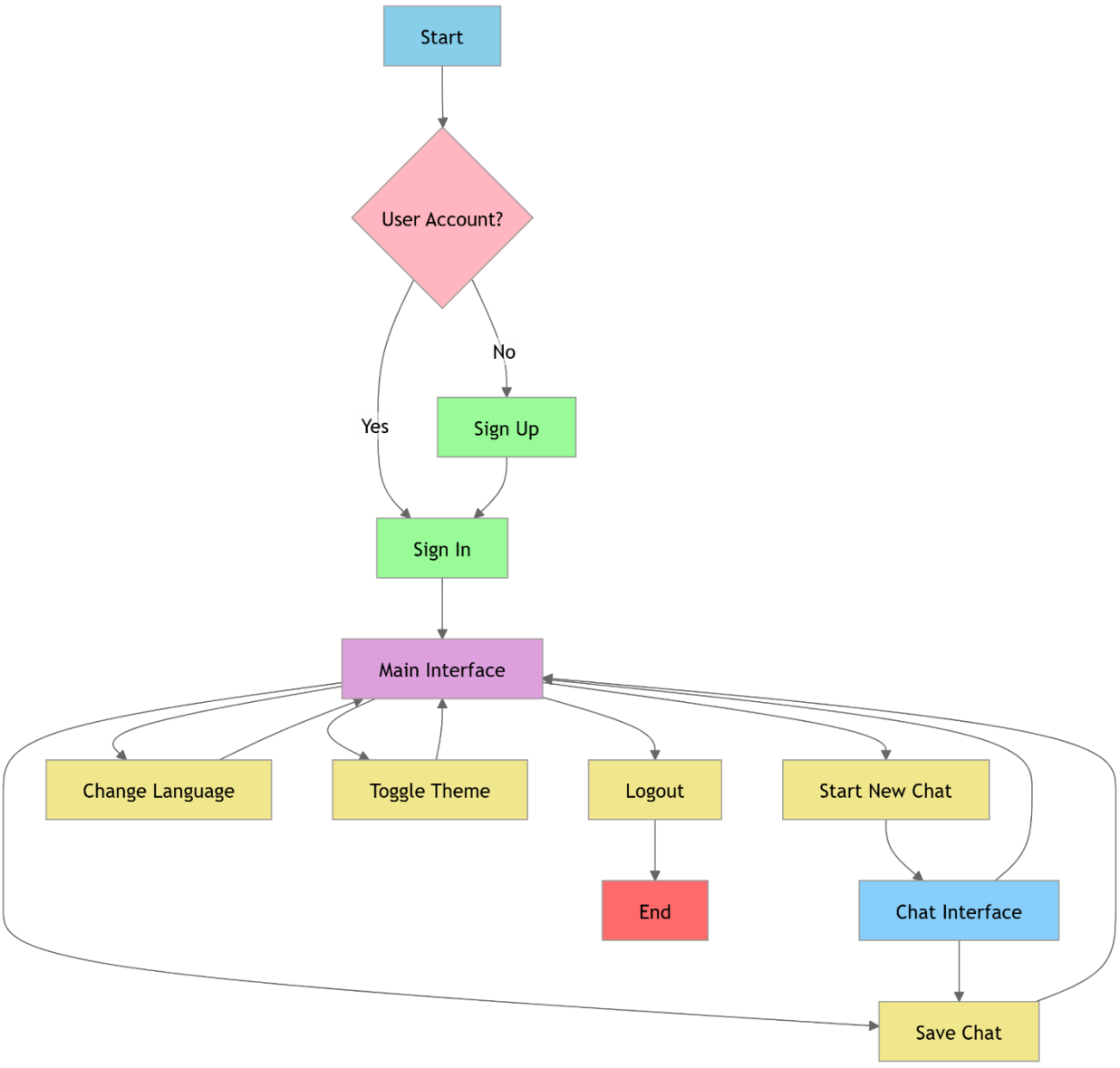


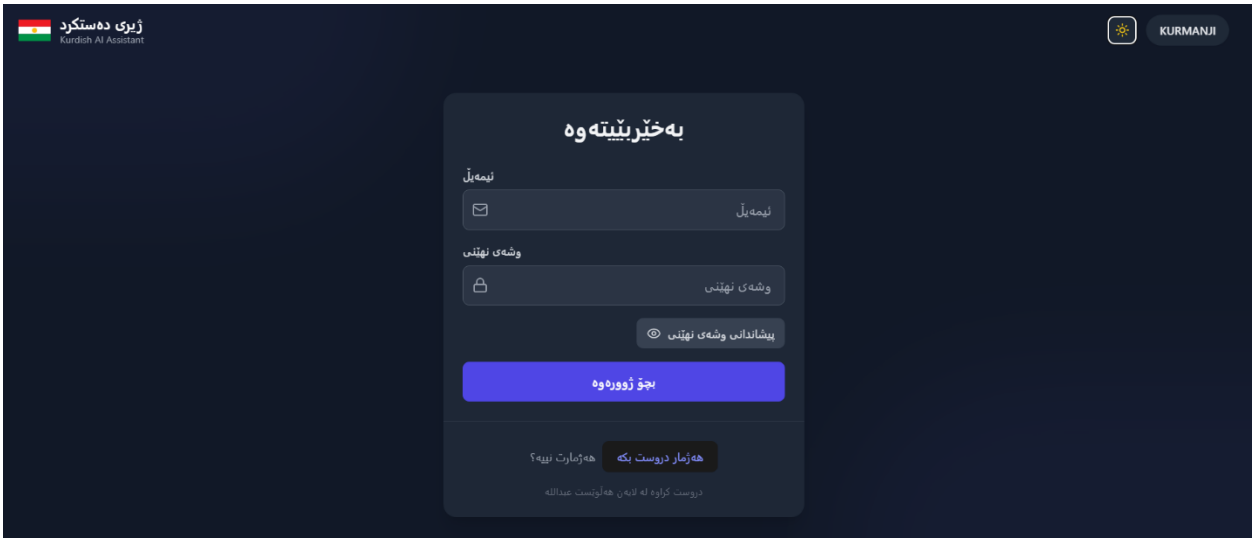
Figure 2 Flowchart of Project

3.2Implementation

Intelligent Chat Assistant with Sorani and Kurmanji Accents Experience the next level of AI-powered conversation with our smart chat assistant, designed to understand and respond in both Sorani and Kurmanji Kurdish. Whether you prefer speaking in Sorani or Kurmanji, the assistant effortlessly adapts to your language choice, providing a smooth and natural interaction. The Kurdish AI Chat System provides a user-friendly interface where users can sign in or create new accounts to access the chat assistant. The system offers a seamless language switching feature allowing users to communicate in their preferred Kurdish dialect. Users can save their chat history for future reference and access their previously saved conversations through the view saved chats feature. The system includes a simple logout option for security. The interface is designed with a clean blue and white color scheme, making navigation intuitive and straightforward for all users, that is the figure 3.

3.3 Interface of the project

It is a login form with a very friendly design



3.2 Login Page

The registration form consisting of these options must be completed

3.3 Registration Page

This is the login and registration section

3.4Home Page

This is the main part of the system that on the left side bar contains several options such as change language, change mode, add chat, update, exit button Below are several sections: Text Box, Add Telegram, Audio Recording

Two accents are also available, Sorani and Kurmanji

Figure 3 Home Page with Sorani

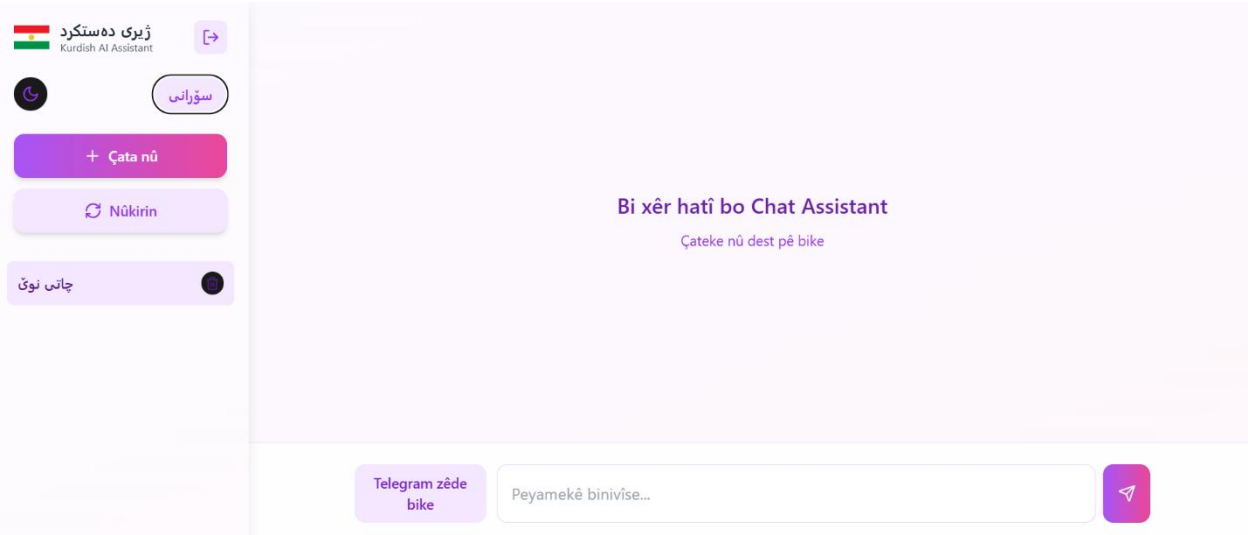


Figure 6 Home Page with Kurmanji

Chapter Four

4.1Chat

Messaging or chat assistant app, with a purple color scheme. At the top, there's text in Kurdish that seems to be introducing the assistant and explaining its capabilities. At the bottom of the screen, there's a message input field with Kurdish placeholder text "نامەیەک بنووسە..." (which means "Write a message...") and some controls including what appears to be a voice input button and a send button.

The visual design is clean and modern, using a light background with purple accent colors. This seems to be an example of a chat assistant that's been localized to support Kurdish language users, making technology more accessible to Kurdish speakers.

4.2Chat Section

There is text box where you can type anything into it and it can reply you on any specific topic

Figure 5 Chat Section

4.3 Speech to Text

there's a voice input feature that works directly with the chat. When you press the microphone button and speak in Kurdish, the after that Click on send "ناردن" converts your speech into written Kurdish text and places it right in the text input box.

Figure 6 Record Button

Figure 7 Send Record

4.4 Telegram Chat Save

This tool connects your chat with Telegram in a very simple way. When you press the "Add Telegram" button, you'll first need to join their bot. After joining the bot, the system will ask you to get your Telegram ID. You enter this ID in the designated text box. Once that's set up, anything you write in the chat box will be automatically sent to your Telegram account.

Figure 8 Add Telegram

Figure 9 Telegram Setup

4.5Costs of Project

It cost so much to build this project

SERVICES	COST
API	25$
SERVER	65$
DOMAIN	10$
SSL	5$

Table 4 Cost of Project

Chapter Five

Conclusion

5.1References

Websites:

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2.Pawan: https://pawan.krd/ - December 5, 2024

3. Vite Dev: https://vite.dev/guide/ - October 2, 2024

Articles:

1. " https://kurdistanchronicle.com/babat/2872 " by Kurdistanchronicle - October 7, 2024

2. "https://www.researchgate.net/publication/371403000_Kurdish_Studies_Analysis_of_Artificial_Intelligence_Adaptation_in_Students_of_Kurdish_Universities" by Research Target - October 11, 2024

Additional Resources:

1. Kurd AI: https://kurd.ai/ - November 12, 2024

2. Odoo: https://www.odoo.com/ - October 22, 2024

3. ChatGPT: https://chatgpt.com/ - October 5, 2024

Books:

1. AI with Python: https://www.pdfdrive.com/ai-with-python-e56913512.html - December12, 2024

2. Python Artificial Intelligence Projects For beginner:https://www.pdfdrive.com/python-artificial-intelligence-projects-for-

beginners-get-up-and-running-with-artificial-intelligence-using-8-smart-and-exciting-ai-applications-e183992068.html - December 8, 2024

3. Deep Learning Using R: https://www.pdfdrive.com/introduction-to-deep-learning-using-r-a-step-by-step-guide-to-learning-and-implementing-deep-learning-models-using-r-e158252417.html - December 12, 2024

4. Designing Web APIs: https://www.pdfdrive.com/designing-web-apis-building-apis-that-developers-love-e176234255.html - October 22, 2024

Appendix

That is the main method to get data between Client and Server:

```
const response = await fetch('https://Server Domain/end points', {
    method: 'POST',
    headers: {
      'Content-Type': 'application/json',
      'Server-Api-Version': '2023-06-01',
      'x-api-key': 'API KEY'
    },
    body: JSON.stringify({
      model: "claude-3-sonnet-20240229", //AI Model
      max_tokens: 1024,
      messages: [
        {
          role: "user",
          content: req.body.message
        }
      ],
      system: "You should respond in Kurdish (Sorani) unless specifically asked otherwise."
    })
  });
```

پوختە

ئەم پڕۆژەیە کاردەکات لەسەر گەشەپێدانی سیستەمێکی ژیری دەستکردی تایبەت بە زمانی کوردی کە توانای گفتوگۆ و بەرسڤدانەوەی بە زمانی کوردی هەیە .ئامانجی سەرەکی پڕۆژەکە بریتییە لە بەرەوپێشبردنی زمانی کوردی لە بواری تەکنەلۆژیادا و دروستکردنی پردێک لە نێوان تەکنەلۆژیای نوێ و زمانی کوردیدا.

تایبەتمەندییە سەرەکییەکانی ئەم پڕۆژەیە بریتین لە پشتگیری تەواوی زمانی کوردی، ئینتەرفەیسێکی ئاسان بۆ بەکارهێنان، توانای تێگەیشتن و وەڵامدانەوە بە زمانی کوردی، و گونجاو بۆ هەموو ئاستەکانی بەکارهێنەر.

بەکارهێنانی ئەم سیستەمە دەبێتە هۆی فێرکردن و فێربوونی زمانی کوردی، یارمەتیدانی بەکارهێنەران لە کارە ڕۆژانەکانیان، پەرەپێدانی توانای زمانەوانی، و دروستکردنی پەیوەندی نێوان نەوەی نوێ و زمانی کوردی.

گرنگی پڕۆژەکە لەوەدا دەردەکەوێت کە یەکەم هەنگاوە بۆ دروستکردنی ژێرخانێکی تەکنەلۆژی بە زمانی کوردی، یارمەتیدەرە بۆ پاراستن و گەشەپێدانی زمانی کوردی، دەبێتە هۆی زیادکردنی بەکارهێنانی زمانی کوردی لە دنیای دیجیتاڵدا، و دەرفەتی نوێ دەڕەخسێنێت بۆ فێربوون و پەرەپێدانی زمانی کوردی.