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DEPARTMENT OF

CSE - ARTIFICIAL INTELLIGENCE

Neural Network and Deep Learning Project

Report On

"PLANT-BOT"

Submitted By

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DEPARTMENT

OF

CSE-ARTIFICIAL INTELLIGENCE

CERTIFICATE

Certified that the mini project work entitled **"Plant-Bot"** carried out by **Srujana Math** **bearing USN 3BR22CA051.** A Bonafide students of Ballari Institute of Technology and Management in partial fulfillment for the award of Bachelor of Engineering in Artificial Intelligence and Machine Learning of the Visvesvaraya Technological University, Belgaum during the year 2025- 2026. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of the project work prescribed for the said Degree.

Signature of Lab Co-Ordinators
Prof. Pavan kumar and Mr. Vijay kumar

Signature of HOD
Dr. Yeresime suresh

ABSTRACT

This project presents an AI-powered Plant Care Chatbot designed to assist users with real-time guidance on watering, sunlight needs, soil selection, pest control, and general plant maintenance. A custom dataset of 10,000 unique intents was generated to train a deep learning–based natural language classification model using PyTorch. The model processes user queries through NLP techniques such as tokenization, stemming, and bagof-words representation to accurately predict plant-care related intents. A multi-layer neural network was developed, achieving high accuracy and strong generalization across diverse plant care topics. The chatbot is deployed using Streamlit, enabling an interactive and user-friendly interface for plant enthusiasts. This system provides reliable, personalized plant care recommendations and serves as a scalable solution for beginner and experienced gardeners.

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of project work on the **"Plant-Bot"** would be incomplete without mentioning those who made it possible. Their noble gestures, affection, guidance, encouragement, and support crowned our efforts with success. It is our privilege to express our gratitude and respect to all those who inspired us in the completion of this project.

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INTRODUCTION

Plants require proper care to maintain healthy growth, and lack of timely knowledge often leads to plant stress, pest attacks, and improper watering or sunlight exposure. Many new plant owners, especially urban gardeners, struggle to understand specific care needs for different plants. Artificial Intelligence, particularly NLP-based chatbots, has emerged as a powerful tool to support real-time assistance in various domains. In gardening, an intelligent chatbot can eliminate guesswork and provide personalized guidance.

This project introduces **PlantBot**, an intelligent chatbot that understands natural language queries and responds with appropriate plant-care instructions. Trained on a large custom dataset containing **10,000 unique intents**, PlantBot can accurately interpret various care-related questions and offer actionable recommendations.

The chatbot uses NLP preprocessing, deep learning models, and a Streamlit interface to create a seamless user experience, making plant care more accessible and enjoyable.

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CHAPTER 2

OBJECTIVES

1. To build an AI chatbot capable of answering plant-care related queries.
2. To generate a high-quality dataset of 10,000 plant-care intents.
3. To preprocess text using NLP techniques.
4. To train a deep learning classifier using PyTorch.
5. To achieve high prediction accuracy for intents.
6. To deploy the chatbot using a user-friendly interface (Streamlit).

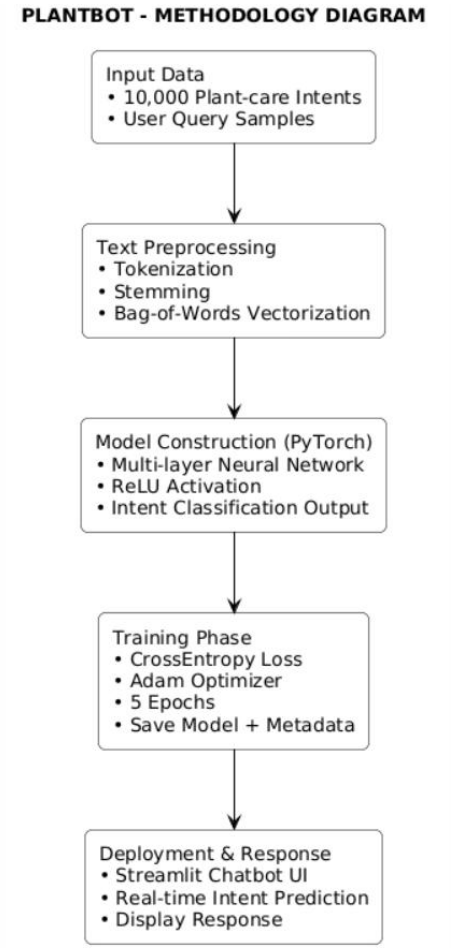
CHAPTER 3

PROBLEM STATEMENT

Beginners often struggle with understanding proper plant care, including watering frequency, soil type, sunlight requirements, and pest control techniques. Manual searching can be time-consuming, and plant-specific information varies widely. There is a need for a real-time conversational assistant that provides reliable guidance, personalized advice, and clear instructions based on user queries. PlantBot addresses this problem by combining NLP and deep learning to classify plant-care queries and respond with accurate, helpful solutions.

CHAPTER 4

METHODOLOGY



4.1 Block Diagram of Emotion Detection Using CNN

The block diagram illustrates the workflow of the chatbot system. User input is first preprocessed through tokenization and stemming. The processed text is converted into a bag-of-words vector and passed to the trained PyTorch neural network. The model predicts the intent label, which is mapped to a predefined response. The response is displayed through the Streamlit interface

CHAPTER 5

REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENTS

1. Accept user queries related to plant care through a text interface.
2. Preprocess text using NLP techniques.
3. Classify queries using the trained neural network model.
4. Provide corresponding plant-care responses.
5. Allow real-time interaction within Streamlit.

NON-FUNCTIONAL REQUIREMENTS

1. Performance: Fast and real-time prediction.
2. Accuracy: High intent classification accuracy using a large dataset.
3. Scalability: Capability to add more intents and plant categories.
4. Usability: Simple and interactive interface for all users.

CHAPTER 6

DESIGN

FLOW CHART

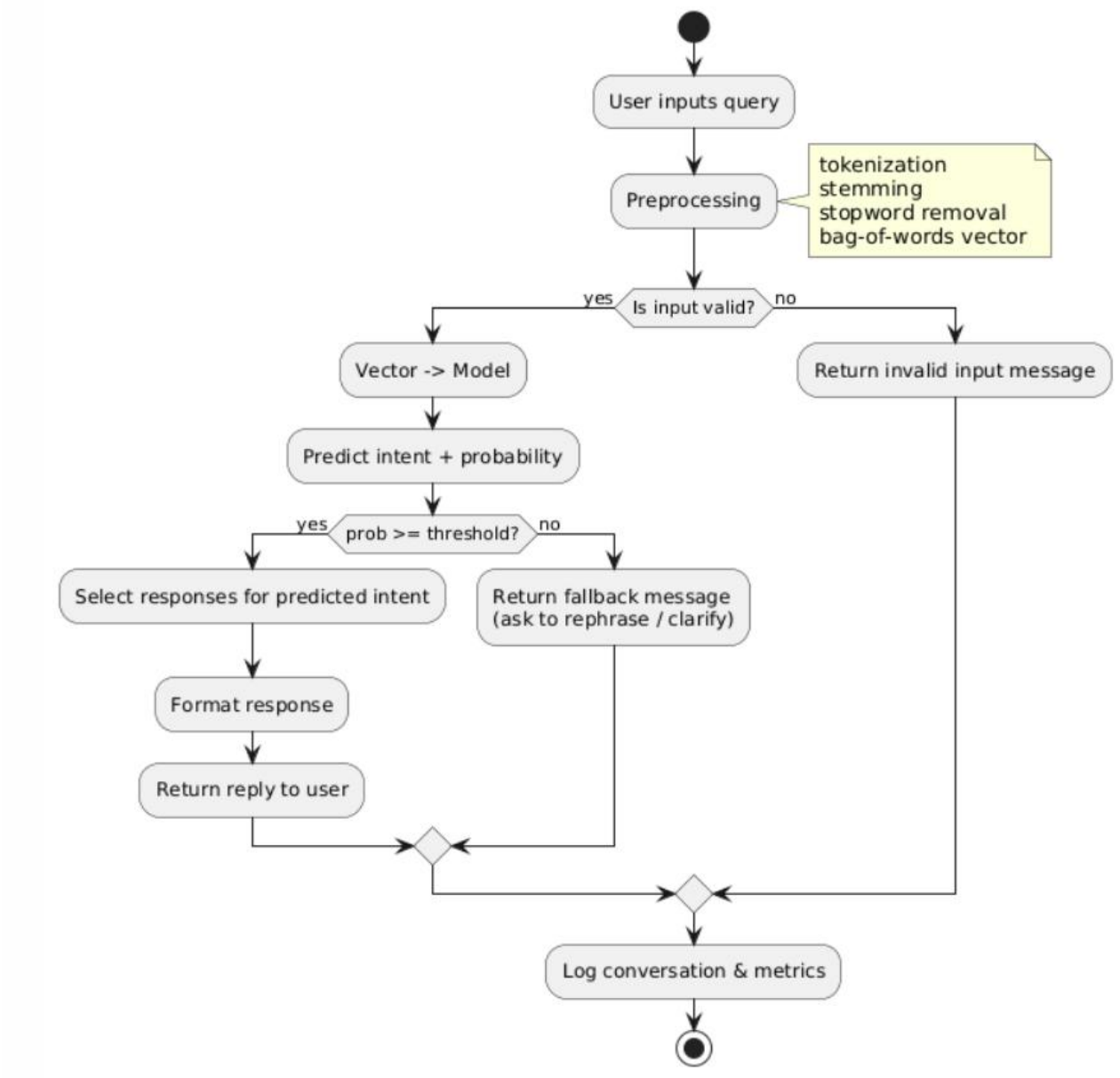


Fig 6.1 Flow Chart

USE CASE DIAGRAM

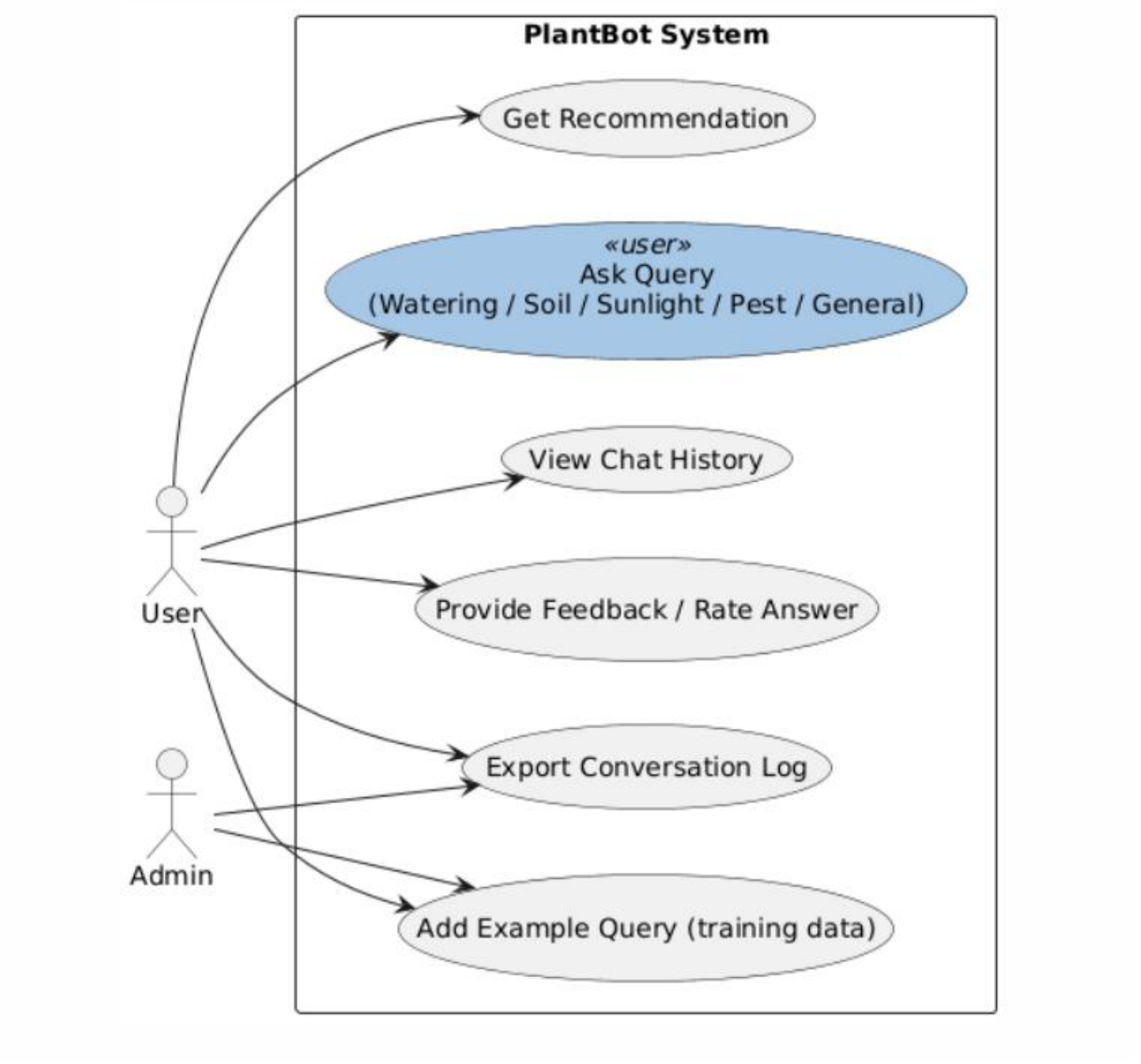


Fig 6.2 Use Case Diagram

SEQUENCE DIAGRAM

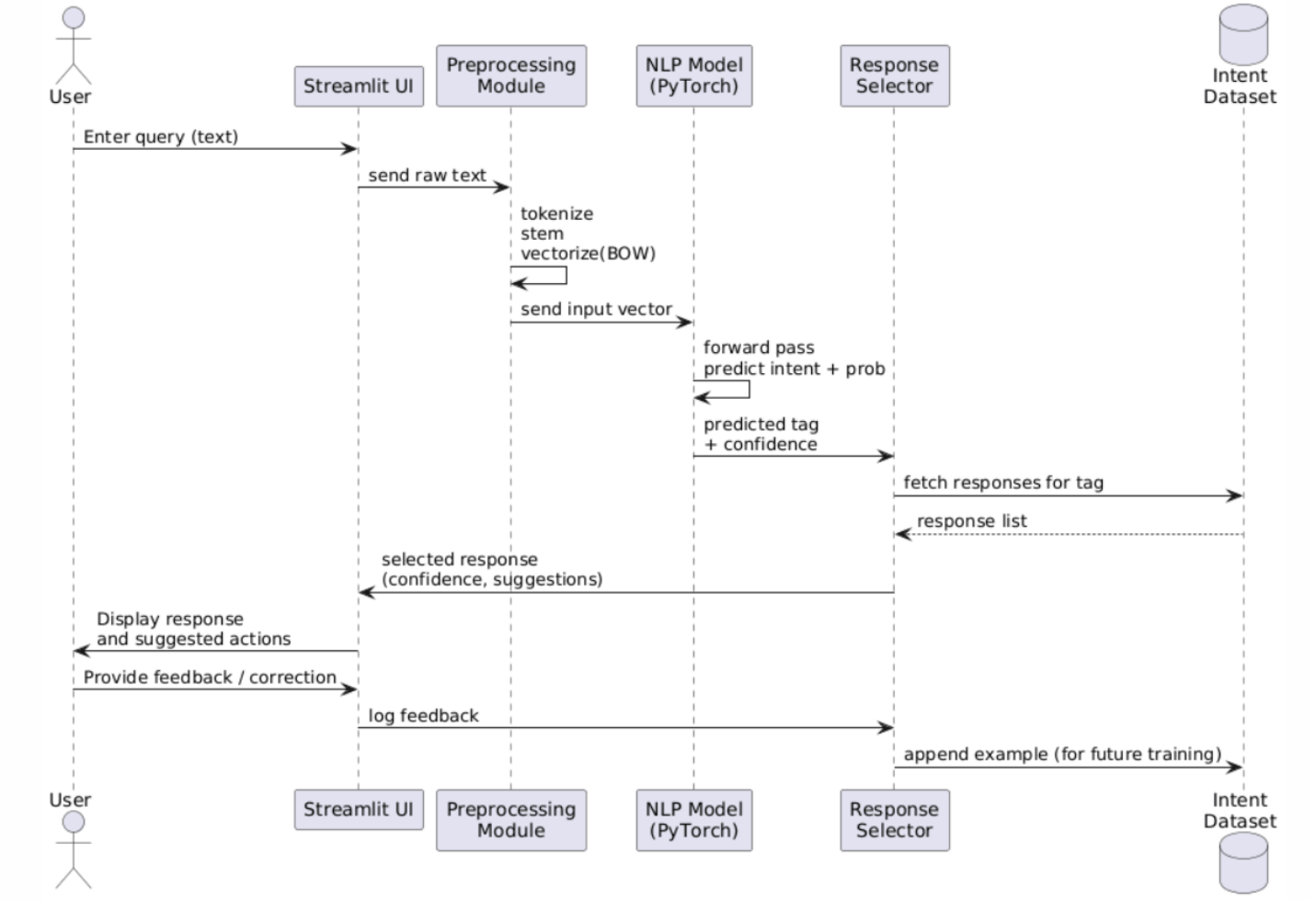


Fig 6.3 Sequence Diagram

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CHAPTER 7

IMPLEMENTATION

Phase 1: Dataset Preparation

- Generate 10,000-tag dataset containing plant-care intents.
- Include variations of user queries and responses.
- Preprocess dataset using tokenization and stemming.

Phase 2: Model Development

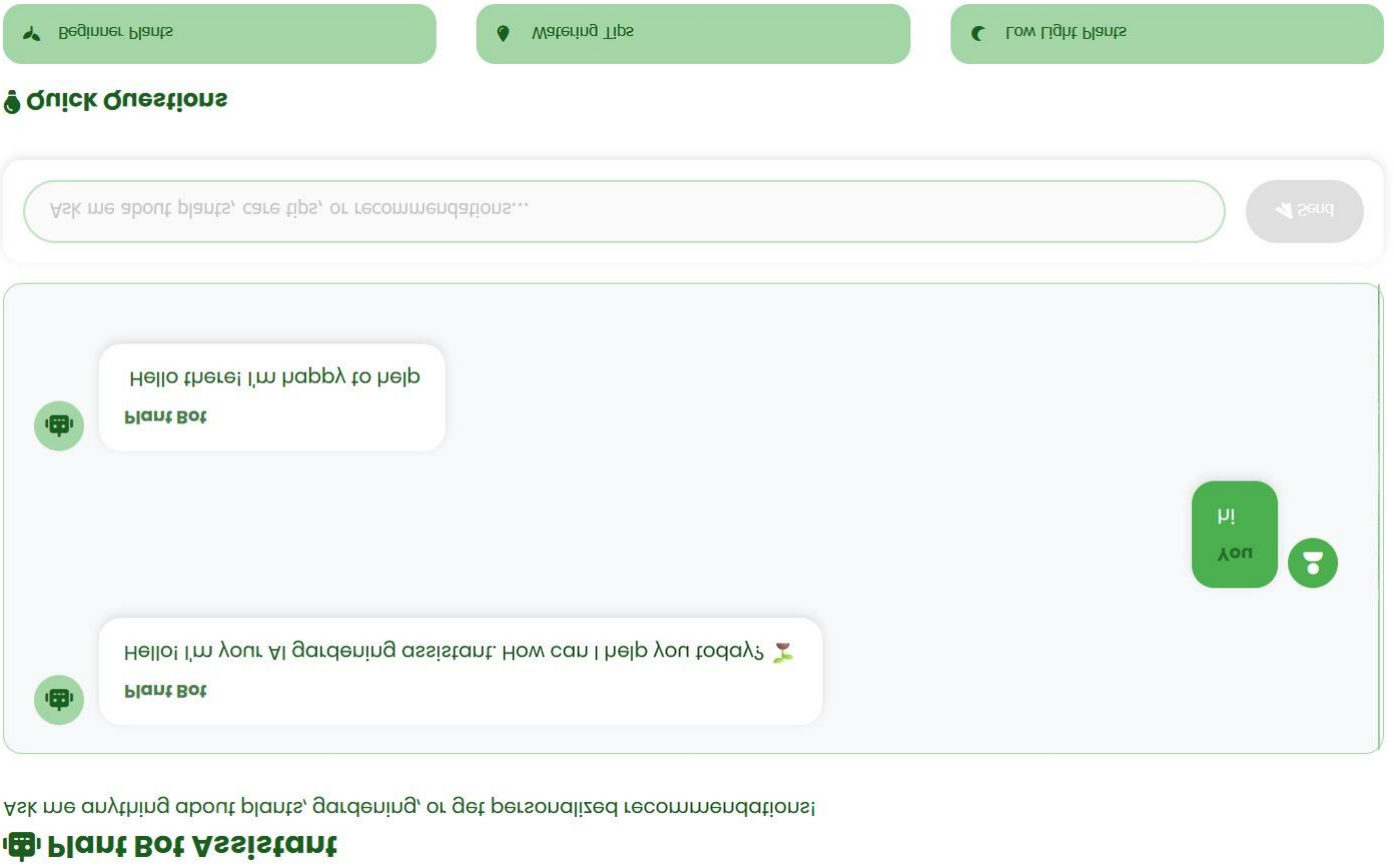
- Build a PyTorch feed-forward neural network.
- Train model for 5 epochs.
- Save model and metadata (all_words, tags, state_dict).

Phase 3: Deployment

- Load model and metadata.
- Implement Streamlit UI.
- Display predicted intent and mapped response in real time.

CHAPTER 8

RESULTS AND DISCUSSION



CHAPTER 9

CONCLUSION

The PlantBot chatbot effectively demonstrates how deep learning and NLP can be applied to plant-care assistance. The neural network model accurately classifies user queries and provides meaningful responses. This system supports beginners in maintaining healthier plants and serves as a foundation for future expansion into advanced gardening AI tools.

CHAPTER 10

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