

COLLEGE OF BUSINESS EDUCATION



DODOMA CAMPUS

A REPORT FOR THE AGRICULTURE AND FARMING SYSTEM APPLICATION FOR TANZANIA

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COURSE: BIT

SUBJECT NAME: PROGRAMMING IN JAVA

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NATURE OF WORK: INDIVIDUAL ASSIGNMENT

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QUESTION

1. A short report (not more than 10 pages) describing the features implemented, screenshots of the project interface and the challenges faced during the development.

PREPARED BY: JOVITHA VENANCE

DECLARATION

I hereby declare that the work presented in this report is my own and has not been submitted previously for any other course, program, or academic requirement. All sources of information, ideas, and data used in this project have been properly referenced.

This project was developed as part of the requirement for the course on Digital Solutions for Everyday Challenges in Tanzania, and all the software development and research involved in the project were conducted by me, following ethical standards of academic integrity.

STUDENT'S Name: JOVITHA VENANCE

Date: 28/01/2023

Signature: JVenance

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CHAPTER ONE

INTRODUCTION AND PROBLEM STATEMENT

Overview of Agriculture and Farming Application System in Tanzania

The Agriculture and Farming System Application is designed to assist farmers and agriculture enthusiasts by providing critical information related to weather forecasts, pest identification, and market prices of agricultural products. The application provides a simple and user-friendly graphical interface, developed using Java Swing, allowing users to easily access the features.

Problem Statement

Tanzanian farmers experience various challenges in their day-to-day activities, including:

- **Unpredictable Weather:** Climate change has exacerbated weather-related challenges. Farmers often struggle to predict the right time to plant, irrigate, or harvest their crops.
- **Pest Outbreaks:** Pests, such as locusts and aphids, can quickly destroy crops, and farmers may not have easy access to pest control methods or identification tools.
- **Market Price Instability:** Farmers have limited access to real-time market prices, which makes it difficult to decide when to sell their products and at what price.

These issues contribute to reduced agricultural productivity, lower incomes for farmers, and overall economic instability in rural areas.

Project Objective

The objective of this application is to provide a **digital solution** to address the everyday challenges of farmers in Tanzania by:

- Offering localized **weather forecasts** to guide farmers in planning their activities.
- Providing **pest identification** tools to help farmers manage crop pests efficiently.
- Displaying **real-time market prices** for common agricultural products to enable farmers to make informed selling decisions.

CHAPTER TWO

FEATURES AND IMPLEMENTATION

Features Implemented

The application provides the following key features:

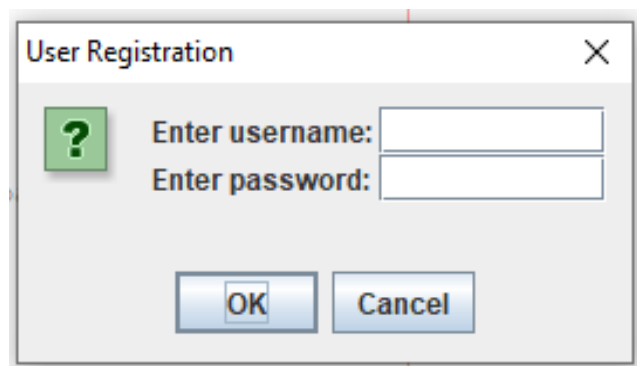
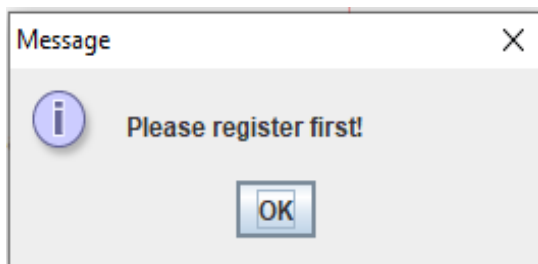
- **User Registration and Login:** Users are required to register with a username and password for security. After successful registration, users can log in to access the application's features.
- **Weather Forecast:** Users can input their region to receive a weather forecast, including temperature, rain conditions, and wind speed. This feature helps users plan farming activities according to weather patterns.
- **Pest Identification:** Users can input the name of a pest to receive information about the pest, its impact on crops, and suggested control measures. This helps farmers quickly identify and manage pest problems.
- **Market Prices:** Users can enter the name of a product (e.g., maize, coffee) to receive the current market price for that product. This feature supports farmers in making informed decisions about selling their produce.

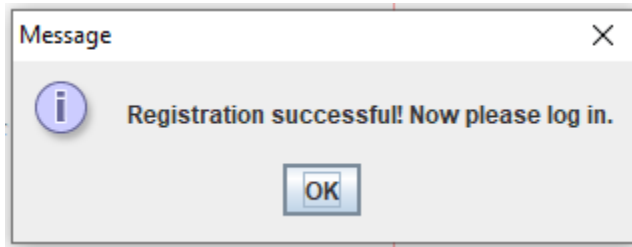
User Interface: The interface includes buttons for each feature and a text area for displaying results. The application also includes an image showing agricultural activities

SCREENSHOTS OF THE PROJECT INTERFACE

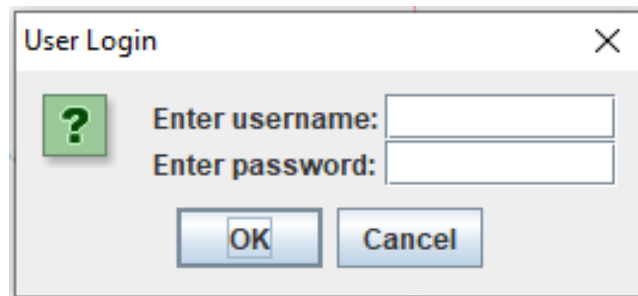
Below are screenshots of the Agriculture and Farming System's interface at various stages.

- **User Registration Screen:** A dialog prompting the user to enter their username and password.

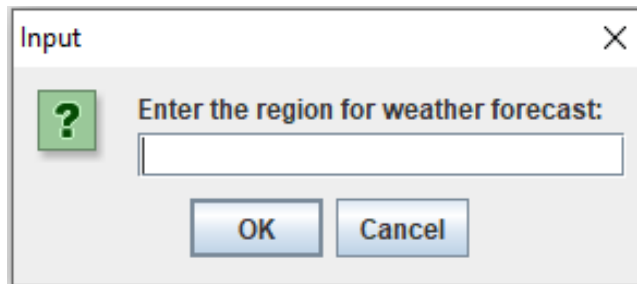




- **User Login Screen:** A dialog prompting the user to enter their username and password.

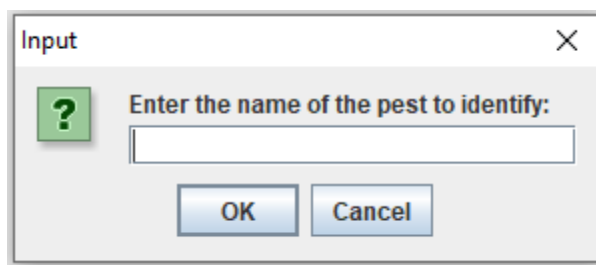


- **Weather Forecast Screen:** A dialog to enter the region, followed by the display of the weather forecast.



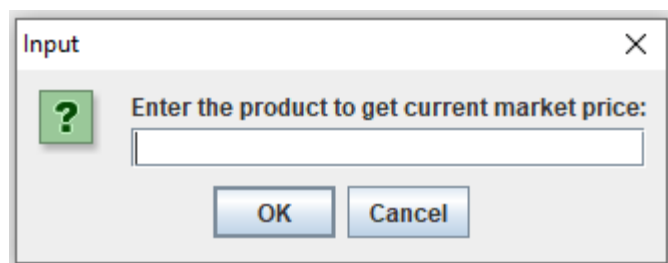
A dialog box titled "Input" with a close button (X) in the top right corner. On the left, there is a green square icon containing a white question mark. To the right of the icon, the text "Enter the region for weather forecast:" is displayed. Below this text is a single-line text input field. At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

- **Pest Identification Screen:** A dialog where users can input a pest's name and view detailed information.



A dialog box titled "Input" with a close button (X) in the top right corner. On the left, there is a green square icon containing a white question mark. To the right of the icon, the text "Enter the name of the pest to identify:" is displayed. Below this text is a single-line text input field. At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

- **Market Price Screen:** A dialog for entering product names and displaying their current market prices.



A dialog box titled "Input" with a close button (X) in the top right corner. On the left, there is a green square icon containing a white question mark. To the right of the icon, the text "Enter the product to get current market price:" is displayed. Below this text is a single-line text input field. At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

Challenges Faced During Development

While implementing these features, several challenges arose, including;

- **User Authentication:** One of the main challenges was ensuring the registration and login processes worked smoothly. Initially, I encountered difficulties in handling password security and ensuring the correct username and password match. This was addressed by using basic string comparison and ensuring proper input validation.
- **Handling Input Data:** Another challenge was the dynamic handling of input data for weather forecasts, pest identification, and market prices. I had to ensure that user input was processed correctly, and default or error messages were displayed when invalid input was provided.
- **Image Handling:** Displaying images (such as for agricultural activities) was also challenging. Ensuring the image loaded correctly and adjusted to fit within the application window was tricky, especially with different screen resolutions. This was solved by resizing the image using Java's `getScaledInstance` method.
- **GUI Layout:** Designing a responsive GUI with all the elements (text areas, buttons, images) correctly aligned was another challenge. Initially, some components were overlapping, but using appropriate layout managers (like `BorderLayout` and `FlowLayout`) helped organize the components neatly.
- **Testing and Debugging:** During testing, I encountered some issues related to event handling and UI updates. Ensuring the text area was updated properly after each action (weather forecast, pest identification, etc.) required careful attention to the event listeners and GUI updates.

CHAPTER THREE

DIGITAL SOLUTIONS AND IMPACT

Digital Solutions for Everyday Challenges in Tanzania;

Benefits of the Agriculture System

The application offers several key benefits:

- **Improved Productivity:** By providing weather forecasts and pest management tools, farmers can avoid crop losses, increasing their yields and overall productivity.
- **Economic Empowerment:** Access to market prices helps farmers secure fair compensation for their products, improving their economic stability.

Digital Solutions for Everyday Challenges

By offering localized solutions for weather, pests, and market prices, the application directly addresses the everyday challenges faced by Tanzanian farmers. It empowers farmers by giving them:

- **Access to timely and relevant information:** This information helps farmers make informed decisions, enhancing their productivity and profitability.
- **Sustainable farming practices:** The app promotes eco-friendly farming techniques, reducing the reliance on chemical pesticides and promoting natural pest control methods.

CONCLUSION

The Agriculture and Farming System Application provides a set of useful features to assist farmers in making informed decisions about their farming activities. Despite the challenges faced during development, the project successfully meets its goal of providing weather forecasts, pest identification, and market prices. The application is an essential tool for farmers in making data-driven decisions for efficient agricultural practices

APPENDICES

- Code listing for the `AgricultureSystemGUI` class.
- Additional technical details on how the image was handled and resized.

REFERENCES

1. **Tanzania National Bureau of Statistics (NBS)**. (2020). *Agriculture Sector Statistics Report*. Retrieved from <https://www.nbs.go.tz>
2. **OpenWeatherMap** . (2021). *Weather Forecast API*. Retrieved from <https://openweathermap.org/api>