MANAGE AGRICULTURAL OPERATIONS

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COMPUTER SCIENCE

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INTRODUCTION

Overview of the project

This outlines a micro project aimed at developing a Farm Management System that assists farmers in organizing and tracking various aspects of their agricultural operations. The primary goal of this Farm Management System (FMS) is to provide a comprehensive tool for farmers to manage various aspects of their agricultural operations efficiently. This includes functionalities for managing crop planting schedules, harvest schedules, livestock records, and farm expenses, thereby streamlining farm management tasks and improving efficiency.

Problem statement

Farmers face challenges in managing numerous farm tasks, such as tracking planting and harvesting schedules, maintaining livestock records, and managing expenses. Traditional methods can lead to inefficiencies, data loss, and errors. There is a need for a streamlined digital solution to manage these tasks efficiently.

Objectives

The primary objective of this project is to develop a user-friendly Farm Management System that:

1. **Manages Crop Planting:** Allows farmers to input and store information about crop planting, including crop name, type, and area planted.
2. **Maintains Harvest Schedules:** Enables farmers to record and track planting and harvesting dates for various crops.
3. **Keeps Livestock Records:** Facilitates the recording and management of livestock information, including name, breed, age, weight, and health status.
4. **Tracks Farm Expenses:** Provides a means for farmers to log and monitor farm-related expenses, including descriptions, dates, and amounts.

By achieving these objectives, the Farm Management System aims to improve the efficiency and accuracy of farm management, ultimately contributing to better farm productivity and profitability.

System Requirements

Hardware Requirements

- Processor: Intel(R) Core(TM) i3-7130U CPU @ 2.70GHz 2.71 GHz

- RAM: 4.00 GB
- Storage: 194 GB
- Display: Standard monitor with 1920 x 1080 resolution

Software Requirements

- Operating System: Windows
- Compiler: GCC (GNU Compiler Collection)
- Text Editor: Visual Studio Code

DESIGN AND DEVELOPMENT

The main menu is presented to the user upon starting the program, offering five options:

1. Manage Crop Planting
2. Harvest Schedule
3. Livestock Records
4. Farm Expenses
5. Exit

The user selects an option by entering the corresponding number. The program then calls the appropriate function based on the user's choice. The menu continues to loop until the user chooses to exit the program.

Functions

Each option in the main menu corresponds to a specific function designed to handle a particular aspect of farm management. These functions are:

1. **manage_crop()**: Collects and stores information about crop planting.
2. **harvest_schedules()**: Records planting and harvesting dates for crops.
3. **livestock_records()**: Manages records of livestock details.
4. **farm_expenses()**: Tracks and logs farm-related expenses.

PSEUDOCODE

```
Start
Display Main Menu
Repeat
   Get user choice
   If choice = 1
```

```
        Call manage_crop()
    Else if choice = 2
        Call harvest_schedules()
    Else if choice = 3
        Call livestock_records()
    Else if choice = 4
        Call farm_expenses()
    Else if choice = 5
        Display "Exiting..."
        Exit loop
    Else
        Display "Invalid choice"
Until choice = 5
End

Function manage_crop()
    Get crop details from user
    Open crop.txt file in append mode
    Write crop details to file
    Close file
End

Function harvest_schedules()
    Get schedule details from user
    Open schedule.txt file in append mode
    Write schedule details to file
    Close file
End

Function livestock_records()
    Get livestock details from user
    Open livestock_records.txt file in append mode
    Write livestock details to file
    Close file
End

Function farm_expenses()
    Get expense details from user
```

Open farm_expenses.txt file in append mode
Write expense details to file
Close file
End

Testing and Results

Test Cases

Test Case 1: Adding a crop

- Input: Crop name: Wheat, Type: Grain, Area: 5.0 acres
- Expected Output: Crop details are stored in crop.txt

Test Case 2: Adding a harvest schedule

- Input: Crop name: Wheat, Planting date: 01/01/2024, Harvesting date: 01/06/2024
- Expected Output: Schedule details are stored in schedule.txt

Test Case 3: Adding livestock record

- Input: Name: Cow, Breed: Jersey, Age: 5, Weight: 450.5 kg, Health status: Good
- Expected Output: Livestock details are stored in livestock_records.txt

Test Case 4: Adding farm expense

- Input: Description: Fertilizer, Date: 15/01/2024, Amount: 200.75
- Expected Output: Expense details are stored in farm_expenses.txt

Output Screenshots or Results

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\lenovo\Documents\K> cd Project
PS C:\Users\lenovo\Documents\K\Project> gcc microproject.c
PS C:\Users\lenovo\Documents\K\Project> ./a.exe
Farm Manangement System
1.Manage Crop Planting
2.Harvest Schedule
3.Livestock Records
4.Farm Expenses
5.Exit
Enter your choice:
1
Enter the crop name:Maize
Enter the type of crop:Cereal
Enter the area of the crop to be planted:1
Farm Manangement System
1.Manage Crop Planting
2.Harvest Schedule
3.Livestock Records
4.Farm Expenses
5.Exit
Enter your choice:
2
Enter the crop name:Maize
Enter the planting date of the crop:01/03/2020
Enter the date of the plant to be harvested:01/07/2020
Farm Manangement System
1.Manage Crop Planting
2.Harvest Schedule
3.Livestock Records
4.Farm Expenses
5.Exit
Enter your choice:
3
Enter the name:Cat
Enter the breed:Short-Haired
Enter the age:12
Enter the weight:34
Enter the health status:Healthy and Vibrant female cat
Farm Manangement System
1.Manage Crop Planting
2.Harvest Schedule
3.Livestock Records
4.Farm Expenses
5.Exit
Enter your choice:
```

```
Enter your choice:
4
Enter the expense description:Seedlings
Enter the date(DD/MM/YYYY):23/04/2020
Enter the amount:530

Farm Manangement System
1.Manage Crop Planting
2.Harvest Schedule
3.Livestock Records
4.Farm Expenses
5.Exit
Enter your choice:
5
Exiting...
PS C:\Users\lenovo\Documents\K\Project>
```

Project > crop.txt

```
1   Maize     Cereal   1.000000
2
```

Project > schedule.txt

```
1   Maize   01/03/2020  01/07/2020
2
```

Project > livestock_records.txt

```
1   Cat  Short-Haired    12  34.000000   Healthy and vibrant female cat
2
```

Project > farm_expenses.txt

```
1   Seedlings    23/04/2020  530.000000
2
```

Conclusion

Summary of the Project

The Farm Management System was designed and implemented to streamline the management of farm operations. It allows for efficient handling of crop planting, harvest schedules, livestock records, and farm expenses.

Future Enhancements

1. Implementing a graphical user interface (GUI) for better user experience.
2. Adding features for automated reminders for planting and harvesting schedules.
3. Integrating with mobile devices for on-the-go farm management.
4. Adding data analysis features to help farmers make informed decisions.