Project Report: Chicken Farm Simulation Report
Course: Introduction to Programming
Assignment Number: 2
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Objective

This program simulates the operations of a chicken farm, tracking daily feed consumption, egg production, slaughtered chickens, income, and expenses. It uses user-provided inputs to model the performance of the chickens over a given number of days. Below is a summary of how the program works.

Main Components and Classes:

1. Chicken Class:

The Chicken class represents individual chickens on the farm. Each chicken has the following attributes:

- **daysWithoutLaying:** Tracks consecutive days without egg production.
- **daysSinceArrival:** Tracks the number of days since the chicken arrived at the farm.
- **totalEggCount:** Tracks the total number of eggs laid by the chicken.

The class includes the following methods:

- **eatFeed():** Simulates daily feed consumption, generating a random value between 100 and 120 grams.
- **layEgg():** This simulates egg-laying. The chicken does not lay eggs for the first three days, then lays a random number (0, 1, or 2) thereafter.
- **isTimeForSlaughter():** Determines if the chicken should be slaughtered, either due to not laying eggs for 3 consecutive days or having laid 100 eggs.
- **reset():** Resets the chicken's attributes when it is replaced after being slaughtered.

2. Farm Class:

The Farm class manages the overall farm operations, including the chickens, feed, and financials. It contains the following attributes:

- **capital:** The farm's available capital.
- **chickenCount:** The number of chickens on the farm.
- **feedKgPrice:** The price per kilogram of feed.
- **eggPrice:** The selling price per egg.
- **chickenPurchasePrice:** The price of purchasing a new chicken.
- **remainingFeed:** The remaining feed on the farm.
- **chickens[]:** An array holding up to 500 chickens.

The main method in this class is runSimulation(), which runs the farm simulation for a given number of days, updating daily expenses, income, feed consumption, and chicken slaughtering.

Program Flow:

1. Initial Inputs:

The user is prompted to enter the following parameters:

- Initial capital.
- Number of chickens (up to 500).
- Feed price per kilogram.
- Egg selling price.
- Chicken purchase price.
- Number of days to run the simulation.

2. Farm Initialization:

The program calculates the initial expenses for purchasing chickens and feed, and checks if the capital is sufficient. If the capital is insufficient, the program terminates.

3. Simulation:

Each day, the program tracks the following:

- Daily feed consumption and egg production.
- Chickens are checked for slaughter conditions and replaced if necessary.
- Income from egg sales and expenses from feed and chicken purchases are updated.
- The day's results are printed in a tabular format.

4. Simulation End:

If the capital goes below zero during the simulation, the program ends and prints a bankruptcy message.

Conclusion:

This program effectively simulates the daily operations of a chicken farm, providing insight into the management of feed, chickens, and financials. It allows the user to see how various factors such as egg production, feed costs, and chicken turnover impact the farm's profitability.