

TITLE: FOOD EXPIRY ALERT SYSTEM

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ABSTRACT

1. To computerize all details regarding food inventory including item name, purchase date, and expiry date.
2. Scheduling timely alerts and notifications to make it convenient for the user to consume or utilize food before it spoils.
3. Scheduling the inventory management system so that food is fully utilized in an effective and efficient manner, thus reducing wastage.
4. Scheduling the consumption and disposal records so that it is convenient for the user to monitor household or business food waste patterns.
5. Scheduling the system to be user-friendly and accessible via a simple interface for easy data entry and retrieval.
6. Scheduling the system to provide an estimated cost analysis of potential food wastage to make the user aware of financial losses.
7. Scheduling the feature to allow for cancellation of alerts or updating of expiry dates if an item is consumed or disposed of early.

INTRODUCTION OF THE PROJECT

What is a Food Expiry Alert System Project In Python?

A Food Expiry Alert System Project In Python is a computer system that helps keep track of food inventory, shelf life information, and helps users or businesses better manage their stock and minimize waste.

Food Expiry Alert System In Python: Project Information

The system provides the following benefits:

1. It is user-friendly.
2. It helps in reducing the workload of manual inventory checking.
3. It helps in reducing paperwork, data entry, and manual coordination.
4. It can also improve the accuracy and quality of data by providing clear, up-to-date expiry information.
5. It helps in preventing or minimizing waste due to forgotten or expired products.
6. It helps to access a complete inventory list, purchase dates, and alert schedules.
7. It follows a logical process to match the food item to its expiry date and trigger a timely alert.

Features of Food Expiry Alert System Project

1. Manage Inventory & Alerts

The system allows users to log new food items, automatically calculates alert dates (e.g., 3 days before expiry), and sends notifications.

2. Manage Food Categories

In this feature, all information about different food items (Produce, Dairy, Meat, Pantry) can be managed, allowing for customized handling based on the item type.

3. Manage Consumption Records

The system makes it possible to get all of an item's history through a system with just a few clicks. The user can see information like the item's storage location, purchase date, estimated cost, and disposal reason. These pieces of information help to track usage patterns and reduce waste.

MODULE DESCRIPTION

The provided Python code defines a Food Expiry Alert System with core functionalities for Create, Read, Update, and Delete (CRUD) operations on food items, coupled with an automated email notification system for expiring goods. The program primarily utilizes the standard Python libraries csv, smtplib, datetime, and email.message.

Primary Modules and Functions:

The code consists of a main menu that calls the following functions to perform specific tasks:

1.Email Notification Module:

send_email_alert(subject, body): This function handles the crucial alert mechanism. It establishes a secure connection to the SMTP server (smtp.gmail.com on port 465), logs in using predefined credentials (SENDER_EMAIL, SENDER_PASSWORD), and transmits an **EmailMessage** containing the expiry notification to the RECIPIENT_EMAIL.

2.CRUD Module (Inventory Management)

- create_item(item_name, expiry_date_str): This function is responsible for **adding a new food item** to the persistence layer (food_items.csv). It validates the date format (YYYY-MM-DD) and appends the item name and expiry date to the CSV file.
- read_items(): This function retrieves and **displays all currently stored food items** from the CSV file. It is used as a utility function by the update and delete modules to present the user with a selection list.

- `update_item()`: This function facilitates the **modification of an existing item's expiry date**. It first reads the current list, prompts the user to select an item by number, validates the new date, and then rewrites the entire CSV file with the updated information.
- `delete_item()`: This function **removes a selected item** from the inventory. It reads the current list, allows the user to select an item for removal, and then overwrites the CSV file, excluding the deleted entry.

1. Alert Checking and Main Control Module

- `check_expiry()`: This core logic function **scans the food_items.csv** file. It calculates the number of days remaining until expiry for each item and identifies those that are **expired** (days left < 0) or **expiring soon** (days left ≤ 3). It then compiles these results into a notification message and calls `send_email_alert()` if any alerts are necessary.
- `main_menu()`: This function serves as the **program's main control interface**. It presents a console menu to the user, accepts input (1-5), and directs the flow of execution to the appropriate CRUD or alert functions. It runs in a continuous while True loop until the user chooses to exit.

ALGORITHM

1. **Start**
2. Import necessary modules: csv, smtplib, datetime, and EmailMessage.
3. Define global constants for email credentials: SENDER_EMAIL, SENDER_PASSWORD, and RECIPIENT_EMAIL.
4. Define the function send_email_alert(subject, body):
 - Attempts to establish a secure SSL connection to the SMTP server.
 - Logs in using the SENDER_EMAIL and SENDER_PASSWORD.
 - Constructs an EmailMessage with the subject and body.
 - Sends the message to the RECIPIENT_EMAIL.
 - Prints success or error status.
5. Define CRUD functions:
 - create_item(item_name, expiry_date_str): Appends a new item and its expiry date (after validating YYYY-MM-DD format) to food_items.csv.
 - read_items(): Reads and returns all items from food_items.csv for display and manipulation.
 - update_item(): Calls read_items(), prompts the user for item number and a new date, and rewrites the CSV file with the updated entry.
 - delete_item(): Calls read_items(), prompts the user for the item number to delete, and rewrites the CSV file, excluding the selected entry.
6. Define the function check_expiry():
 - Initialize two lists: expired_items and expiring_soon.
 - Read all rows from food_items.csv.
 - **Loop** through each food item row:

- Parse the expiry_date_str into a date object.
- Calculate days_left until expiry.
- **IF** days_left < 0: Add item name to expired_items.
- **ELSE IF** days_left <= 3: Add item name and days_left to expiring_soon.
- **IF** expired_items or expiring_soon lists are not empty:
 - Compile a single notification_message.
 - Call send_email_alert("Food Expiry Alert", notification_message).
- **ELSE**: Print "No alerts to send."

7. Define the function main_menu():

- **WHILE** True (loop indefinitely until exit):
 - Print the main menu options (1: Add, 2: Check Alerts, 3: Update, 4: Delete, 5: Exit).
 - Get user choice (1-5).
 - **IF** choice = '1': Get item and date_str, call create_item(item, date_str).
 - **ELSE IF** choice = '2': Call check_expiry().
 - **ELSE IF** choice = '3': Call update_item().
 - **ELSE IF** choice = '4': Call delete_item().
 - **ELSE IF** choice = '5': Print "Goodbye! 🙋", and use the **break** keyword to exit the loop.
 - **ELSE**: Print "Invalid choice. Please enter a number from 1 to 5."

8. Execute the script by calling main_menu() under the if __name__ == "__main__": block.

9. **Stop**

output:

```
=== Food Expiry System ===
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 1
Enter item name: kurkure
Enter expiry date (YYYY-MM-DD): 2025-09-28
✅ 'kurkure' added successfully!

=== Food Expiry System ===
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 1
Enter item name: milk
Enter expiry date (YYYY-MM-DD): 2025-10-02
✅ 'milk' added successfully!

=== Food Expiry System ===
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 2
❌ Error sending email alert: [Errno 101] Network is unreachable
```

```
=== Food Expiry System ===
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 3

--- Your Food Items ---
[1] maggie (Expires: 2025-09-30)
[2] cookies (Expires: 2025-10-03)
[3] biscuit (Expires: 2025-10-20)
[4] kurkure (Expires: 2025-09-28)
[5] milk (Expires: 2025-10-02)
Enter the number of the item you want to update: 1
Enter new expiry date (YYYY-MM-DD): 2025-10-03
✅ Item updated successfully!

=== Food Expiry System ===
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 4

--- Your Food Items ---
[1] maggie (Expires: 2025-10-03)
[2] cookies (Expires: 2025-10-03)
[3] biscuit (Expires: 2025-10-20)
[4] kurkure (Expires: 2025-09-28)
```

```
== Food Expiry System ==
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 3

--- Your Food Items ---
[1] maggie (Expires: 2025-09-30)
[2] cookies (Expires: 2025-10-03)
[3] biscuit (Expires: 2025-10-20)
[4] kurkure (Expires: 2025-09-28)
[5] milk (Expires: 2025-10-02)
Enter the number of the item you want to update: 1
Enter new expiry date (YYYY-MM-DD): 2025-10-03
✅Item updated successfully!

== Food Expiry System ==
1. Add a new item
2. Check for expiring items & get alerts
3. View / Update an item
4. View / Delete an item
5. Exit
Enter your choice (1-5): 4

--- Your Food Items ---
[1] maggie (Expires: 2025-10-03)
[2] cookies (Expires: 2025-10-03)
[3] biscuit (Expires: 2025-10-20)
[4] kurkure (Expires: 2025-09-28)
```

CONCLUSION

The Food Expiry Alert System project successfully integrates CRUD (Create, Read, Update, Delete) functionality with automated expiry checking and professional email alerting. By utilizing CSV for persistence, it provides a simple yet effective way for users to track their food inventory, significantly reducing food waste and promoting household efficiency. The use of formatted terminal output and styled HTML email ensures alerts are both clear and actionable.

REFERENCE

- csv, smtplib, os, datetime Python Standard Libraries
- sparrow coding labs (as provided in the original document)
- External SMTP service (Gmail) documentation for App Password setup.
- Internal Code Functions (e.g., `main_menu`, `check_expiry_and_send_alerts`).