1. Test Plan

Before running the tests, define the key areas to test and the expected outcomes.

Key Areas to Test:

1. **GUI Interaction:**
    - Ensure all buttons, input fields, and tabs function correctly.
    - Validate the responsiveness of the inventory table (automatic updates).
2. **Items Management:**
    - Adding items with valid and invalid inputs.
    - Checking if the inventory table updates immediately.
3. **Category Management:**
    - Adding categories and associating items with categories.
4. **Transactions:**
    - Recording sales with sufficient stock.
    - Handling sales with insufficient stock.
    - Recording restocks and updating the inventory.
5. **Data Persistence:**
    - Verify that data is saved to `inventory.json`.
    - Reload the program and confirm the data is correctly restored.
6. **Error Handling:**
    - Validate the system gracefully handles invalid inputs.

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2. Test Cases

Define test cases to systematically verify the system's behavior.

Test Case Table

Test Case ID	Scenario	Steps to Execute	Expected Outcome
TC-01	Add a valid item	Fill in all fields and press "Add Item".	The item is added to the table and appears in the JSON file.
TC-02	Add an item with missing fields	Leave some fields blank and press "Add Item".	An error message is displayed: "All fields are required."
TC-03	Record a valid sale	Select a valid SKU, enter a quantity within the stock limit, and press "Record Transaction".	Stock decreases by the entered quantity, and the table updates automatically.
TC-04	Record a sale with insufficient stock	Select a valid SKU, enter a quantity greater than the available stock, and press "Record Transaction".	An error message is displayed: "Not enough stock for SKU '...'"
TC-05	Record a valid restock	Select a valid SKU, enter a quantity, and press "Record Transaction".	Stock increases by the entered quantity, and the table updates automatically.
TC-06	Add a valid category	Enter a new category name and press "Add Category".	The category is added and available for selection.
TC-07	Load saved inventory	Close the program, reopen it, and view the inventory.	Inventory data is restored from `inventory.json` and displayed correctly.
TC-08	Automatic inventory update	Perform a sale or restock and wait for 3 seconds.	The inventory table updates automatically without user intervention.

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3. Test Execution

Perform the test cases step by step and record the results.

Example Execution Steps:

1. **Start the Program:**
   - Run `main.py` and ensure all tabs load without errors.
2. **Add Items:**
   - Add a valid item and verify it appears in the table.
   - Attempt to add an item with incomplete details and confirm the error message.
3. **Perform Transactions:**
   - Test a sale and verify the stock decreases.
   - Attempt a sale with insufficient stock and confirm the error message.
   - Test a restock and verify the stock increases.
4. **Category Management:**
   - Add a category and confirm it is available for selection when adding new items.
5. **Check Data Persistence:**
   - Restart the program and confirm all data is loaded from `inventory.json`.
6. **Automatic Updates:**
   - Wait for 3 seconds after performing a transaction and confirm the table updates automatically.

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4. Test Results

Create a table to record the outcomes of each test case.

Test Case ID	Result	Notes
TC-01	Pass	Item added successfully and appeared in the table.
TC-02	Pass	Error message displayed correctly for missing fields.
TC-03	Pass	Stock decreased correctly, and the table updated automatically.
TC-04	Pass	Error message displayed for insufficient stock, and no changes to inventory.
TC-05	Pass	Stock increased correctly, and the table updated automatically.
TC-06	Pass	New category added and available for item association.
TC-07	Pass	Inventory loaded successfully from `inventory.json`.
TC-08	Pass	Table updated automatically after 3 seconds.

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5. Report and Observations

Write a brief summary of your observations:

- **Overall Behavior:** The system worked as expected, and all test cases passed successfully.
- **Key Highlights:** Real-time updates and error handling worked seamlessly.
- **Improvements:** Could include additional features like exporting inventory data to a file or adding user authentication for enhanced security.

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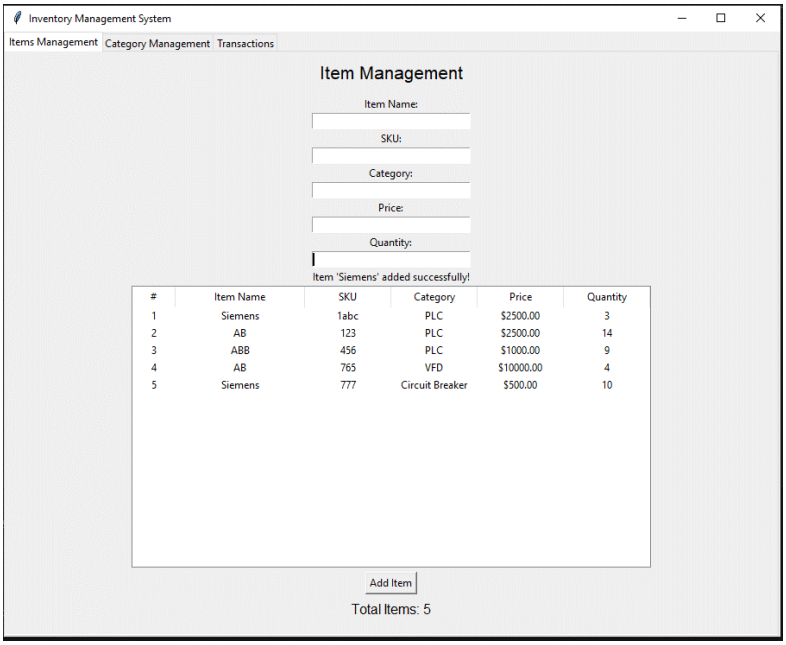
6. Documentation

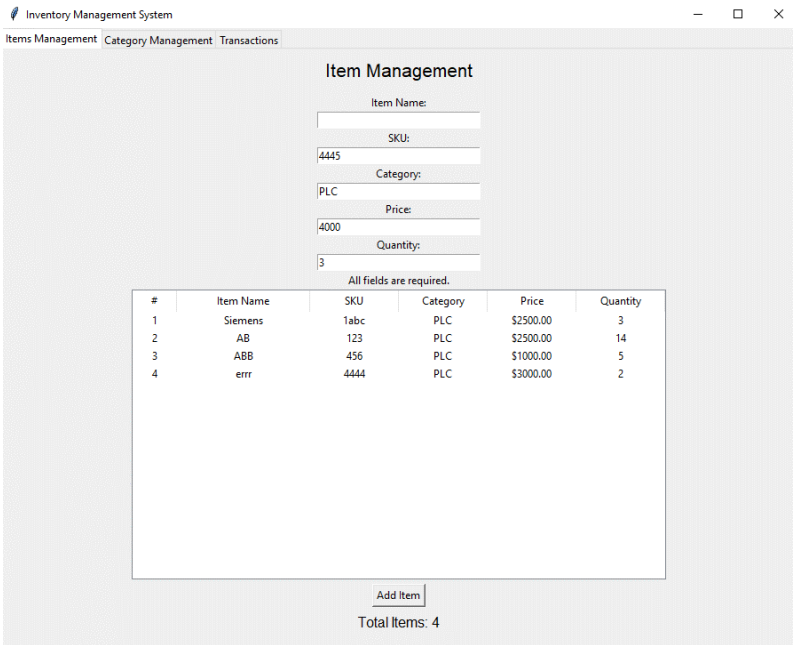
In the next point I add picture of my testing examples.

7. Testing Images

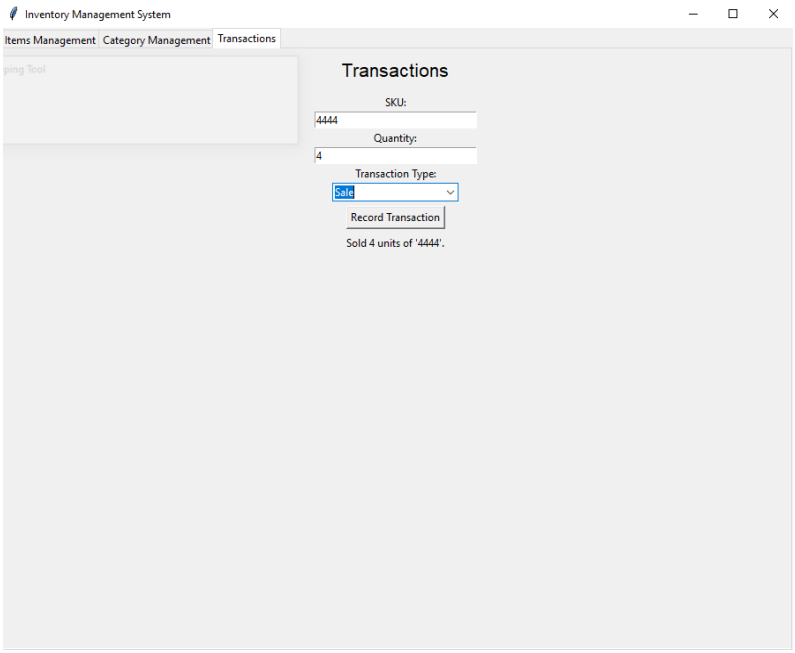
TC-01 Add a valid Item



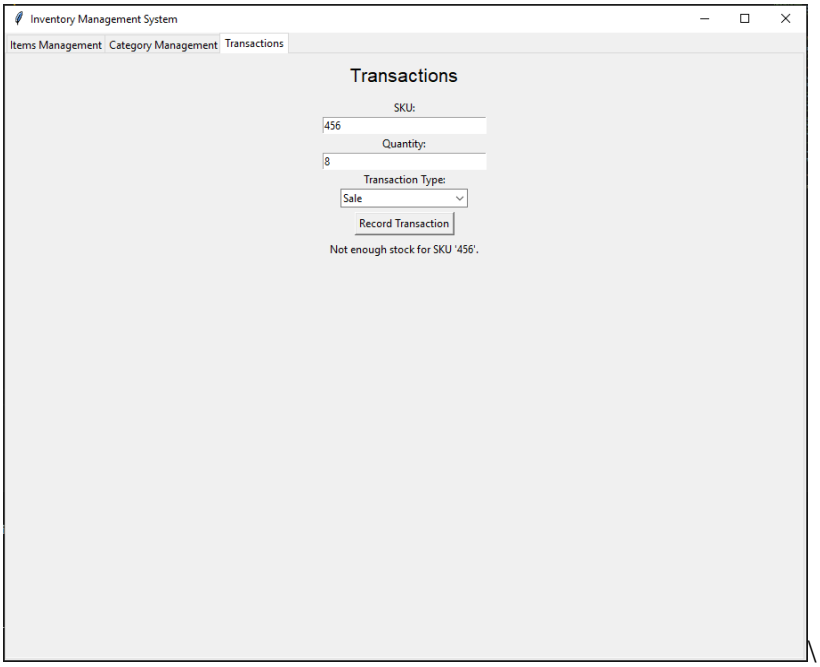
TC-02 Add an item with missing fields



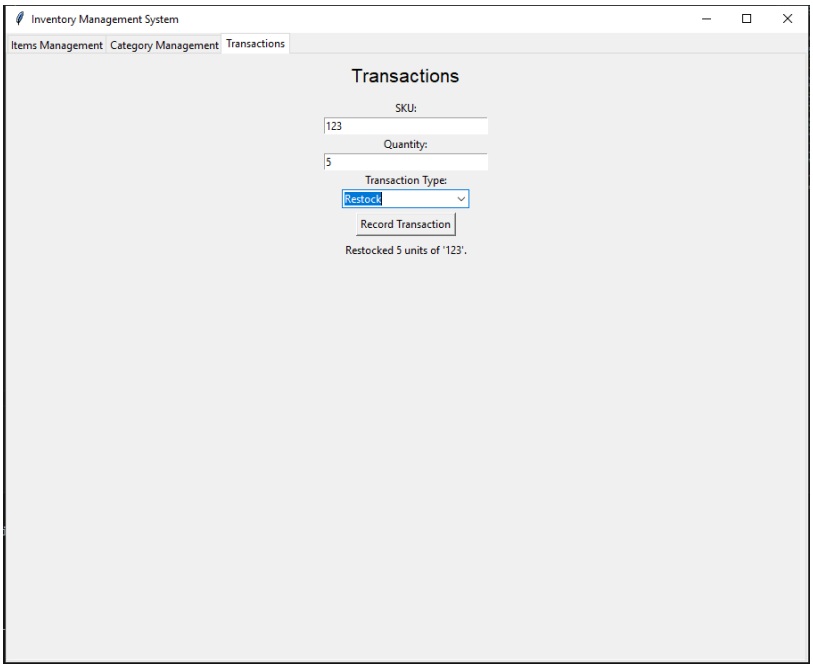
TC-03 Record a valid sale



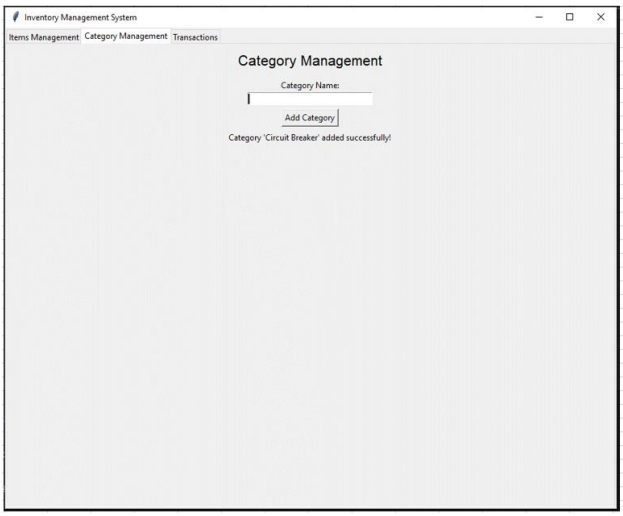
TC-04 Record a valid sale

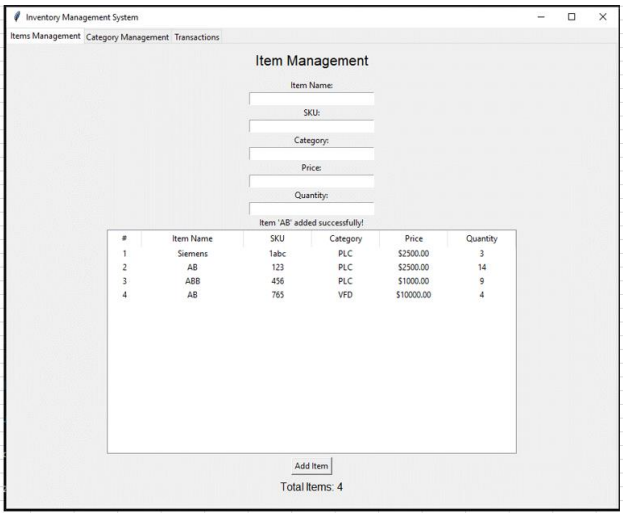


TC-05 Record a valid restock

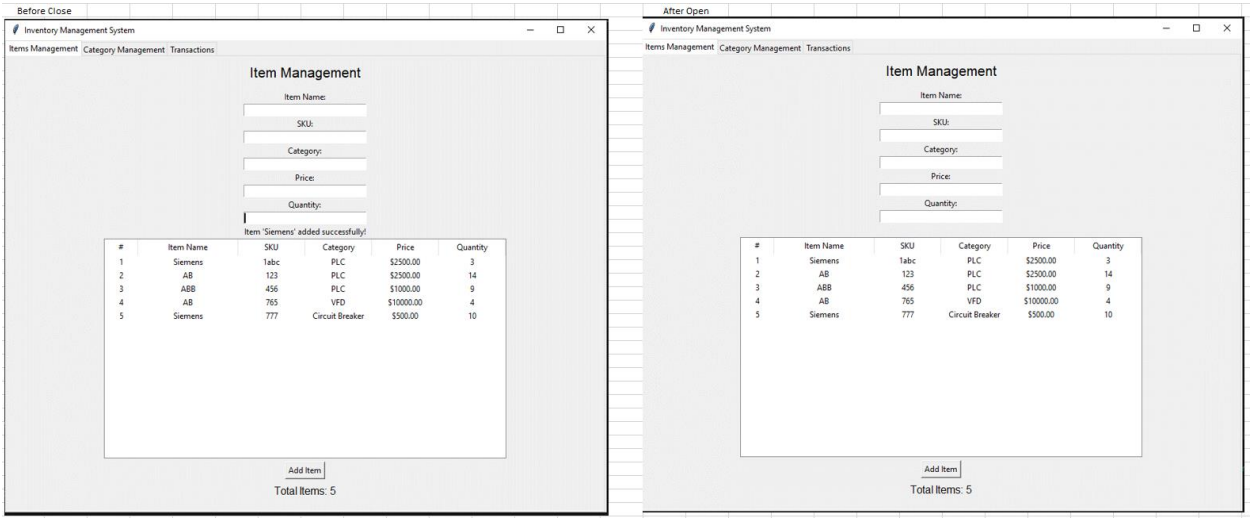


TC-06 Add a valid category





TC-07 Load saved inventory



TC-07 Load saved inventory

This is happening every time we do a transaction or every time we add an Item.