**Input Domain Modeling Steps**

**1. Understanding Functionality:**

We began by analyzing the requirements and behavior of the login and logout functions:

* **Login Function**: Requires a username and password for authentication and handles registration if the username is not found. It includes scenarios like empty passwords, special character handling, and duplicate usernames during registration.
* **Logout Function**: Interacts with a cart object, displays cart contents when applicable, and seeks user confirmation to proceed. Scenarios include mixed case input, invalid input handling, and special character inputs.

**2. Defining Input Variables:**

The inputs were broken down into components for testing:

* **Username**: A string that could be valid, invalid, empty, or duplicate.
* **Password**: A string subject to validation criteria (e.g., length, special characters, uppercase letters).
* **Cart**: An object that can be empty, contain items, or have a large number of items.
* **User Decisions**: Inputs like 'y' (confirm), 'n' (cancel), invalid characters, and special cases (e.g., empty input or mixed case).

**3. Equivalence Classes:**

We identified groups of inputs with similar behaviors, including:

* **Valid and Invalid Login Credentials**: Covering both successful and failed authentication.
* **Usernames**: Empty, valid, and duplicates during registration.
* **Passwords**: Weak, strong, empty, or containing spaces.
* **Cart States**: Empty, populated with items, or containing Unicode/special characters.
* **User Decisions**: Including confirmation, cancellation, and invalid inputs.

**4. Boundary Cases:**

Special attention was given to edge cases, such as:

* **Login**:
  + Empty username or password.
  + Passwords just meeting or failing validation criteria.
  + Duplicate username registration.
* **Logout**:
  + Empty cart vs. cart with multiple or Unicode-named items.
  + Mixed case or invalid confirmation inputs.
  + Logging out without user confirmation or handling special characters.

**5. Creating Realistic Scenarios:**

To mimic real-world usage, test cases reflected common user behaviors, such as:

* **Login**:
  + Mistyped credentials or empty inputs.
  + Attempting to register an already existing username.
* **Logout**:
  + Cancelling a logout after reviewing cart contents.
  + Using mixed case or special character inputs.
  + Logging out with a large cart or items containing Unicode characters.