**DFD Components**

1. **Processes**:
   * 1.0 Login
   * 2.0 Display Home Screen
   * 3.0 Scan Barcode
   * 4.0 Fetch Item Details
   * 5.0 Display Item List
   * 6.0 Group Items
2. **Data Stores**:
   * D1: User Credentials (Validates login)
   * D2: Item Database (Stores product details)
   * D3: Scanned Items (Temporary session storage)
3. **External Entity**:
   * User

**+-----------------+ 1. Credentials +----------------+**

**| | -----------------------> | |**

**| User | | Android App |**

**| | <----------------------- | |**

**| (actor) | 2. Authentication | |**

**+-----------------+ +----------------+**

**^ 3. Barcode Data**

**|----------------------**

**|**

**| 4. Item Details**

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**|**

**+------------+**

**| Barcode |**

**| Scanner |**

**+------------+**

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**| 1.0 Login Process |**

**| |**

**+---> | Inputs: Username, Password |**

**| | Outputs: Auth Token / Flag |**

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**| |**

**| | (queries)**

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**| | 1. Credentials +----------------> | | |**

**| User | ----------------> | Data Store: User | | P1 |**

**| (External) | <---------------- | Credentials DB | <-------| |**

**+--------------+ 2. Auth Result +-------------------------+ Returns**

**|**

**| 3. Login Success/Failure**

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**| Home Screen |**

**| (P0.5) |**

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**| 4. “Scan Items” command**

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**| 2.0 Scan Item Process |**

**(camera input) | |**

**----------------> | Inputs: Raw Barcode Data |**

**| Steps: |**

**| a) Decode barcode → ItemID |**

**| b) Query Data Store: Item Master |**

**| c) Build “Scanned Item” record |**

**| Outputs: Scanned Item Record (with |**

**| details: name, price, category, etc.)|**

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**| 5. New Scanned Item**

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**| Data Store: Item Master DB |**

**| (Static / Remote or Local Reference) |**

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**|**

**| (reads/writes)**

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**| Data Store: Scanned‐Items Store |**

**| (keeps accumulating “Scanned Item” rows) |**

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**| 6. Trigger “Display List” /**

**| “Group Items” (next process)**

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**| 3.0 Display & Group Items Process |**

**| |**

**| Inputs: Full List of Scanned Items |**

**| Steps: |**

**| a) Read all records from Scanned‐Items |**

**| b) Apply grouping logic (e.g., by |**

**| category, price range, or custom) |**

**| c) Format grouped data for UI |**

**| Outputs: Grouped‐Item List for UI |**

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**| 7. Grouped Item List**

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**| UI Layer |**

**| (“ListView” |**

**| / Recycler) |**

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**|**

**| 8. Display to User**

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**| User |**

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**Data Flow Descriptions**

1. **Login**:
   * User → 1.0 Login: Credentials (username/password)
   * 1.0 Login → D1: Validation Request
   * D1 → 1.0 Login: Validation Result
   * 1.0 Login → User: Login Status (success/fail)
2. **Home Screen Navigation**:
   * 1.0 Login → 2.0 Display Home Screen: Session Token
   * User → 2.0 Display Home Screen: Menu Selection (e.g., "Scan" or "View List")
3. **Barcode Scanning**:
   * 2.0 Display Home Screen → 3.0 Scan Barcode: Scan Command
   * User → 3.0 Scan Barcode: Barcode Data (via camera)
   * 3.0 Scan Barcode → 4.0 Fetch Item Details: Barcode ID
4. **Fetch Item Details**:
   * 4.0 Fetch Item Details → D2: Item Query
   * D2 → 4.0 Fetch Item Details: Product Details (name, category, price)
   * 4.0 Fetch Item Details → D3: New Item Data
5. **Display Item List**:
   * 2.0 Display Home Screen → 5.0 Display Item List: View List Command
   * D3 → 5.0 Display Item List: Scanned Items
   * 5.0 Display Item List → User: Item List (ungrouped)
6. **Group Items**:
   * User → 5.0 Display Item List: Grouping Criteria (e.g., "Category" or "Price")
   * 5.0 Display Item List → 6.0 Group Items: Grouping Request
   * D3 → 6.0 Group Items: Scanned Items
   * 6.0 Group Items → 5.0 Display Item List: Grouped Data (e.g., items grouped by category)
   * 5.0 Display Item List → User: Grouped List