# Functional Requirement

# 1. Functional Requirements  
  
## 1.1 Customer Registration Function   
\*\*Function ID:\*\* FR-01   
\*\*Description:\*\* Customers can register for an account by providing valid personal information, including email and password. The system must validate the email format, password strength, and ensure the email is not already registered.   
\*\*Input:\*\*   
- Name (string)   
- Email (string)   
- Password (string)   
- Optional: Address (string)   
\*\*Output:\*\*   
- Confirmation email sent to the customer's email address   
- Redirect to the login page   
- New customer account created in the system   
  
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## 1.2 Customer Login Function   
\*\*Function ID:\*\* FR-02   
\*\*Description:\*\* Customers can log into their account by entering their email and password. The system must validate the credentials, check if the account is active and verified, and log the login attempt.   
\*\*Input:\*\*   
- Email (string)   
- Password (string)   
\*\*Output:\*\*   
- Redirect to the homepage or account dashboard   
- Login record added to the system log   
- Session created for the logged-in customer   
  
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## 1.3 Customer Logout Function   
\*\*Function ID:\*\* FR-03   
\*\*Description:\*\* Customers can securely log out of their account. The system must terminate the session and redirect the customer to the homepage or login page.   
\*\*Input:\*\*   
- Session ID (string)   
- User ID (string)   
\*\*Output:\*\*   
- Session terminated   
- Redirect to the homepage or login page   
- Logout record added to the system log   
  
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## 1.4 Admin Login Function   
\*\*Function ID:\*\* FR-04   
\*\*Description:\*\* Administrators can log into the admin interface by entering their username and password. The system must validate the credentials, check if the account is active, and log the login attempt.   
\*\*Input:\*\*   
- Username (string)   
- Password (string)   
\*\*Output:\*\*   
- Redirect to the admin dashboard   
- Login record added to the system log   
- Session created for the logged-in admin   
  
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## 1.5 Admin Logout Function   
\*\*Function ID:\*\* FR-05   
\*\*Description:\*\* Administrators can securely log out of their account. The system must terminate the admin session and redirect them to the admin login page or homepage.   
\*\*Input:\*\*   
- Session ID (string)   
- Admin ID (string)   
\*\*Output:\*\*   
- Session terminated   
- Redirect to the admin login page or homepage   
- Logout record added to the system log   
  
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## 1.6 View Product Details Function   
\*\*Function ID:\*\* FR-06   
\*\*Description:\*\* Customers can view detailed information about a product, including name, description, price, specifications, and images.   
\*\*Input:\*\*   
- Product ID (string)   
- User ID (string)   
\*\*Output:\*\*   
- Displayed product details (name, description, price, specifications, images)   
- Option to add the product to the cart   
  
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## 1.7 Add to Cart Function   
\*\*Function ID:\*\* FR-07   
\*\*Description:\*\* Customers can add products to their shopping cart. The system must check product availability and inventory, and update the cart with the selected product and quantity.   
\*\*Input:\*\*   
- Product ID (string)   
- Quantity (integer)   
- Customer ID (string)   
\*\*Output:\*\*   
- Updated shopping cart with new item and quantity   
- Updated cart summary (total cost, item count)   
- Confirmation message that the product was added   
  
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## 1.8 Modify Cart Item Function   
\*\*Function ID:\*\* FR-08   
\*\*Description:\*\* Customers can modify the quantity of an existing item in their cart or remove it. The system must validate the updated quantity against inventory and update the cart summary accordingly.   
\*\*Input:\*\*   
- Cart Item ID (string)   
- New Quantity (integer) or removal request   
- Customer ID (string)   
\*\*Output:\*\*   
- Updated cart item with new quantity or removed item   
- Updated cart summary (total cost, item count)   
- Confirmation message of the modification   
  
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## 1.9 Remove Cart Item Function   
\*\*Function ID:\*\* FR-09   
\*\*Description:\*\* Customers can remove a specific item from their shopping cart. The system must verify the existence of the cart item and update the cart summary after removal.   
\*\*Input:\*\*   
- Cart Item ID (string)   
- Customer ID (string)   
\*\*Output:\*\*   
- Cart item removed from the database   
- Updated cart summary (total cost, item count)   
- Confirmation message that the item was removed   
  
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## 1.10 Checkout Order Function   
\*\*Function ID:\*\* FR-10   
\*\*Description:\*\* Customers can proceed to checkout with items in their cart. The system must validate the cart, process the selected payment method, update inventory, and send an order confirmation email.   
\*\*Input:\*\*   
- Customer ID (string)   
- Cart ID (string)   
- Payment method (string)   
- Shipping address (string)   
\*\*Output:\*\*   
- Created order record in the database   
- Updated inventory levels   
- Order confirmation email sent to the customer   
- Cart cleared after successful checkout   
  
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## 1.11 Confirm Order Function   
\*\*Function ID:\*\* FR-11   
\*\*Description:\*\* After the payment is processed, the system must confirm the order, update inventory, and send an email confirmation to the customer.   
\*\*Input:\*\*   
- Order ID (string)   
- Payment confirmation status (string)   
- Inventory system access   
\*\*Output:\*\*   
- Finalized order in the database   
- Inventory updated with deducted stock   
- Order confirmation email sent   
- Cart cleared   
  
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## 1.12 Send Order Confirmation Email Function   
\*\*Function ID:\*\* FR-12   
\*\*Description:\*\* The system must send an order confirmation email to the customer after the order is successfully placed. The email must contain order details such as items, total cost, and shipping information.   
\*\*Input:\*\*   
- Order ID (string)   
- Customer email (string)   
- Order details (items, total cost, shipping address)   
\*\*Output:\*\*   
- Order confirmation email sent to the customer   
- Email delivery status logged in the system   
- Updated order status indicating confirmation email was sent   
  
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## 1.13 Create Product Function   
\*\*Function ID:\*\* FR-13   
\*\*Description:\*\* Administrators can create a new product by entering its details and uploading documentation or images. The system must validate the input data and save the product in the database.   
\*\*Input:\*\*   
- Product name (string)   
- Description (string)   
- Price (float)   
- Category ID (string)   
- Specifications (string)   
- Documentation/image files   
\*\*Output:\*\*   
- New product record in the database   
- Product displayed in the catalog   
- Confirmation message shown to the administrator   
  
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## 1.14 Update Product Information Function   
\*\*Function ID:\*\* FR-14   
\*\*Description:\*\* Administrators can update the information of an existing product, including name, description, price, and category. The system must validate the new data and update the product in the database.   
\*\*Input:\*\*   
- Product ID (string)   
- Updated product name (string)   
- Updated description (string)   
- Updated price (float)   
- Updated category ID (string)   
- Updated documentation/image files (optional)   
\*\*Output:\*\*   
- Updated product record in the database   
- Updated product displayed in the catalog   
- Confirmation message shown to the administrator   
  
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## 1.15 Manage Inventory Function   
\*\*Function ID:\*\* FR-15   
\*\*Description:\*\* Administrators can update the inventory levels for products. The system must validate the new inventory quantity and update the database accordingly.   
\*\*Input:\*\*   
- Product ID (string)   
- New inventory quantity (integer)   
\*\*Output:\*\*   
- Updated inventory record in the database   
- Refreshed product catalog reflecting new inventory status   
- Confirmation message shown to the administrator   
  
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## 1.16 Categorize Products Function   
\*\*Function ID:\*\* FR-16   
\*\*Description:\*\* Administrators can assign or reassign a product to a specific category. The system must validate the selected category and update the product's category association in the database.   
\*\*Input:\*\*   
- Product ID (string)   
- Category ID (string)   
\*\*Output:\*\*   
- Updated product category in the database   
- Updated product catalog reflecting new categorization   
- Confirmation message shown to the administrator   
  
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## 1.17 Manage Plugin Function   
\*\*Function ID:\*\* FR-17   
\*\*Description:\*\* Administrators can install, update, or remove plugins from the system. The system must validate the plugin file and manage its status in the database.   
\*\*Input:\*\*   
- Plugin ID (string)   
- Plugin file or repository link (string)   
- Action (install, update, remove)   
\*\*Output:\*\*   
- Plugin status updated in the database   
- Plugin displayed as active/inactive in the plugin management interface   
- Confirmation message shown to the administrator   
  
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## 1.18 Access Plugin Documentation Function   
\*\*Function ID:\*\* FR-18   
\*\*Description:\*\* Administrators can view the documentation for a plugin. The system must retrieve and display the documentation in a structured and user-friendly format.   
\*\*Input:\*\*   
- Plugin ID (string)   
- Admin ID (string)   
\*\*Output:\*\*   
- Plugin documentation displayed (installation instructions, usage examples, etc.)   
- Option to search or navigate within the documentation   
- Error message if documentation is missing or corrupted   
  
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## 1.19 View Purchase History Function   
\*\*Function ID:\*\* FR-19   
\*\*Description:\*\* Customers can view their purchase history, which includes all completed orders. The system must retrieve and display order details such as date, items, and total cost.   
\*\*Input:\*\*   
- Customer ID (string)   
\*\*Output:\*\*   
- List of past orders with key details (order date, total cost, status)   
- Detailed view of selected order (items, quantities, shipping address, payment method)   
- Error message if no orders are found   
  
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## 1.20 Calculate Total Cost Function   
\*\*Function ID:\*\* FR-20   
\*\*Description:\*\* The system must calculate the total cost of the cart based on the quantity and price of each item.   
\*\*Input:\*\*   
- Cart Item list (CartItem objects with Product ID and Quantity)   
- Product Price (from Product entity)   
\*\*Output:\*\*   
- Updated TotalCost value for the cart   
- Cart summary updated with the new total cost   
  
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## 1.21 View Cart Summary Function   
\*\*Function ID:\*\* FR-21   
\*\*Description:\*\* The system must display a summary of the customer's shopping cart, including the number of items and the total cost.   
\*\*Input:\*\*   
- Cart ID (string)   
- Cart Item list (CartItem objects)   
- TotalCost (float)   
\*\*Output:\*\*   
- Cart summary displayed with item count and total cost   
- Error message if cart is empty   
  
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## 1.22 Manage Quantity Function   
\*\*Function ID:\*\* FR-22   
\*\*Description:\*\* The system must manage the quantity of each item in the cart, ensuring it is valid and does not exceed available inventory.   
\*\*Input:\*\*   
- Cart Item ID (string)   
- New quantity (integer)   
\*\*Output:\*\*   
- Updated quantity in the cart item   
- Updated TotalCost in the cart   
- Error message if the quantity is invalid or exceeds available stock   
  
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## 1.23 Manage Purchase History Function   
\*\*Function ID:\*\* FR-23   
\*\*Description:\*\* The system must maintain and manage the purchase history of each customer, recording each completed order and its details.   
\*\*Input:\*\*   
- Customer ID (string)   
- Order ID (string)   
- Product ID (string)   
- Purchase date (datetime)   
- Quantity (integer)   
\*\*Output:\*\*   
- Updated PurchaseHistory record in the database   
- Purchase history displayed on the customer account page   
  
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## 1.24 Manage User Function   
\*\*Function ID:\*\* FR-24   
\*\*Description:\*\* Administrators can manage user accounts, including creating, updating, or deactivating customer and admin accounts.   
\*\*Input:\*\*   
- User ID (string)   
- Username (string)   
- Email (string)   
- Password (string)   
- Status (string)   
- Role (string)   
\*\*Output:\*\*   
- Updated or created user account in the database   
- Confirmation message displayed to the admin   
- User account status reflected in the interface