# Functional Requirement

### 1.1 Customer Registration   
\*\*Function ID\*\*: FR-01   
\*\*Description\*\*: Allows new customers to create accounts by providing personal information. Validates email uniqueness and password complexity. Creates a customer record and sends confirmation email.   
\*\*Input\*\*: Name (string), email (string), password (string)   
\*\*Output\*\*: New customer record stored in Customer entity (CustomerID, Name, Email, Password)   
  
### 1.2 User Login   
\*\*Function ID\*\*: FR-02   
\*\*Description\*\*: Authenticates customers/administrators using email and password. Grants access to respective dashboards upon successful verification.   
\*\*Input\*\*: Email (string), password (string)   
\*\*Output\*\*: Active user session, redirect to customer/admin dashboard   
  
### 1.3 User Logout   
\*\*Function ID\*\*: FR-03   
\*\*Description\*\*: Terminates active user sessions, clears session data, and redirects to the login page.   
\*\*Input\*\*: Session token   
\*\*Output\*\*: Session termination, redirect to login page   
  
### 1.4 Update Customer Information   
\*\*Function ID\*\*: FR-04   
\*\*Description\*\*: Enables customers to modify profile details (e.g., address, phone). Validates field integrity and email uniqueness.   
\*\*Input\*\*: CustomerID (int), updated fields (e.g., Address, Phone)   
\*\*Output\*\*: Modified attributes in Customer entity   
  
### 1.5 View Customer Information   
\*\*Function ID\*\*: FR-05   
\*\*Description\*\*: Displays customer details (e.g., order history, contact info) for administrators or the customer themselves.   
\*\*Input\*\*: CustomerID (int)   
\*\*Output\*\*: Customer entity data (Name, Email, Address, Phone)   
  
### 1.6 Add Product   
\*\*Function ID\*\*: FR-06   
\*\*Description\*\*: Allows administrators to create new product entries with details (name, price, category) and associate them with categories.   
\*\*Input\*\*: Name (string), Description (text), Price (float), StockQuantity (int), CategoryID (int)   
\*\*Output\*\*: New record in Product entity; association in ProductCategory entity   
  
### 1.7 Update Product   
\*\*Function ID\*\*: FR-07   
\*\*Description\*\*: Enables administrators to edit product attributes (e.g., price, description) and update category associations.   
\*\*Input\*\*: ProductID (int), modified fields (e.g., Price, Description, CategoryID)   
\*\*Output\*\*: Updated attributes in Product entity; modified ProductCategory linkage   
  
### 1.8 Delete Product   
\*\*Function ID\*\*: FR-08   
\*\*Description\*\*: Removes a product from the system if no active orders reference it. Prevents deletion for data integrity.   
\*\*Input\*\*: ProductID (int)   
\*\*Output\*\*: Removal of Product entity record   
  
### 1.9 Browse Products   
\*\*Function ID\*\*: FR-09   
\*\*Description\*\*: Lists available products with core details (name, price) for customers/admins.   
\*\*Input\*\*: None (catalog request)   
\*\*Output\*\*: List of Product entities (ProductID, Name, Price)   
  
### 1.10 View Product Details   
\*\*Function ID\*\*: FR-10   
\*\*Description\*\*: Displays comprehensive product information (description, stock, category) when selected.   
\*\*Input\*\*: ProductID (int)   
\*\*Output\*\*: Full Product entity data + linked Category details   
  
### 1.11 Add Category   
\*\*Function ID\*\*: FR-11   
\*\*Description\*\*: Creates new product categories with unique names for product classification.   
\*\*Input\*\*: Name (string), Description (text)   
\*\*Output\*\*: New record in Category entity   
  
### 1.12 Update Category   
\*\*Function ID\*\*: FR-12   
\*\*Description\*\*: Modifies category attributes (name, description) while ensuring name uniqueness.   
\*\*Input\*\*: CategoryID (int), updated fields (Name/Description)   
\*\*Output\*\*: Modified attributes in Category entity   
  
### 1.13 Delete Category   
\*\*Function ID\*\*: FR-13   
\*\*Description\*\*: Removes a category if no products are associated with it.   
\*\*Input\*\*: CategoryID (int)   
\*\*Output\*\*: Removal of Category entity record   
  
### 1.14 View Category Details   
\*\*Function ID\*\*: FR-14   
\*\*Description\*\*: Shows category information and linked products.   
\*\*Input\*\*: CategoryID (int)   
\*\*Output\*\*: Category entity data + list of associated Products   
  
### 1.15 Add to Shopping Cart   
\*\*Function ID\*\*: FR-15   
\*\*Description\*\*: Adds a product to the customer’s cart after stock verification. Updates cart totals.   
\*\*Input\*\*: CustomerID (int), ProductID (int), Quantity (int)   
\*\*Output\*\*: New CartItem record; updated ShoppingCart total   
  
### 1.16 Update Shopping Cart   
\*\*Function ID\*\*: FR-16   
\*\*Description\*\*: Modifies product quantities or removes items from the cart. Recalculates cart totals.   
\*\*Input\*\*: CartItemID (int), new Quantity (int; 0 for removal)   
\*\*Output\*\*: Updated CartItem.Quantity or record deletion; revised ShoppingCart total   
  
### 1.17 View Shopping Cart   
\*\*Function ID\*\*: FR-17   
\*\*Description\*\*: Displays all items in the cart, quantities, prices, and total cost.   
\*\*Input\*\*: CustomerID (int)   
\*\*Output\*\*: List of CartItems + Product details; ShoppingCart total amount   
  
### 1.18 Place Order   
\*\*Function ID\*\*: FR-18   
\*\*Description\*\*: Converts cart items into an order, processes payment, reduces inventory, and sends confirmation.   
\*\*Input\*\*: CustomerID (int), PaymentMethodID (int), shipping/billing details   
\*\*Output\*\*: New Order and OrderItem records; reduced Product.StockQuantity; email confirmation   
  
### 1.19 Browse Orders   
\*\*Function ID\*\*: FR-19   
\*\*Description\*\*: Lists orders (for customers: their own; for admins: all orders).   
\*\*Input\*\*: CustomerID (int, for customers) or none (for admins)   
\*\*Output\*\*: Order summaries (OrderID, OrderDate, TotalAmount)   
  
### 1.20 View Order Details   
\*\*Function ID\*\*: FR-20   
\*\*Description\*\*: Shows comprehensive order information, including items and status.   
\*\*Input\*\*: OrderID (int)   
\*\*Output\*\*: Order entity data + OrderItem list + PaymentMethod details   
  
### 1.21 Cancel Order   
\*\*Function ID\*\*: FR-21   
\*\*Description\*\*: Cancels eligible orders (e.g., not shipped), restocks inventory, and notifies the customer.   
\*\*Input\*\*: OrderID (int)   
\*\*Output\*\*: Order.Status set to "Canceled"; increased Product.StockQuantity   
  
### 1.22 Update Order Status   
\*\*Function ID\*\*: FR-22   
\*\*Description\*\*: Allows admins to change order status (e.g., "Shipped") and notify customers.   
\*\*Input\*\*: OrderID (int), new Status (string)   
\*\*Output\*\*: Updated Order.Status; notification email   
  
### 1.23 Manage Inventory   
\*\*Function ID\*\*: FR-23   
\*\*Description\*\*: Adjusts product stock levels (e.g., after shipments/returns).   
\*\*Input\*\*: ProductID (int), new StockQuantity (int)   
\*\*Output\*\*: Updated Product.StockQuantity   
  
### 1.24 Manage Customer Payment Methods   
\*\*Function ID\*\*: FR-24   
\*\*Description\*\*: Adds/edits/removes customer payment methods (e.g., credit cards).   
\*\*Input\*\*: PaymentMethodID (int, for edit/remove), Type (string), TokenizedCard (string), ExpiryDate (date)   
\*\*Output\*\*: New/updated/deleted PaymentMethod record   
  
### 1.25 Assign Product to Category   
\*\*Function ID\*\*: FR-25   
\*\*Description\*\*: Links a product to a category via the ProductCategory entity.   
\*\*Input\*\*: ProductID (int), CategoryID (int)   
\*\*Output\*\*: New ProductCategory association record   
  
### 1.26 Manage Administrator Accounts   
\*\*Function ID\*\*: FR-26   
\*\*Description\*\*: Adds/edits/deletes administrator accounts with role permissions.   
\*\*Input\*\*: AdminID (int, for edit/delete), Name (string), Email (string), Role (string)   
\*\*Output\*\*: New/updated/deleted Administrator record   
  
### 1.27 Delete Customer   
\*\*Function ID\*\*: FR-27   
\*\*Description\*\*: Removes customer accounts if no active orders exist.   
\*\*Input\*\*: CustomerID (int)   
\*\*Output\*\*: Deleted Customer record + dependent PaymentMethods   
  
### 1.28 Delete Order   
\*\*Function ID\*\*: FR-28   
\*\*Description\*\*: Permanently deletes orders in cancellable states (e.g., "Canceled").   
\*\*Input\*\*: OrderID (int)   
\*\*Output\*\*: Removal of Order and OrderItem records   
  
### 1.29 Update Order Items   
\*\*Function ID\*\*: FR-29   
\*\*Description\*\*: Modifies items in pending orders (e.g., quantity changes), adjusts inventory and order totals.   
\*\*Input\*\*: OrderID (int), OrderItemID (int), new Quantity (int)   
\*\*Output\*\*: Updated OrderItem.Quantity; revised Order.TotalAmount; adjusted Product.StockQuantity