# Test Plan

**Company: Complete Foods Inc.**
**Project: Online Grocery Shopping Application**
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**Version 1.0**

## Component Overview

Since we are developing an online commerce application, we will be observing a Model-View-Controller architecture integrated with a Client-Server architecture for cloud storage. There are two components (server and client) for transferring data to and from remote storage. Additionally, we have a data-security component for authenticated users and safeguarding private data.

**Cloud-Server Component**: this component is responsible for servicing data requests from client devices. These requests will include product information, store information, user profile data, purchase transactions and delivery information. This component must receive these requests, correctly query the underlying database and return the requested information.

**Cloud-Client Component**: this component is responsible for making requests to the cloud-server based on user interactions and consuming the resulting response.

**Data-Security Component**: this component is responsible for authenticating users before any private or profile information is accessed or manipulated.

**Data-Model Component**: this component is responsible for converting the data received by the cloud-client into local objects and data structures.

**Data-Controller Component**: this component is responsible for interpreting user interactions, retrieving data requested by these interactions, and returning the requested data to the underlying view objects. In the event the requested data is not in local memory, this component is responsible for making the necessary service requests via the cloud-client component.

**View Component**: this component is responsible for presenting the end-user interface, receiving interaction events from the user, and updating the display based on data received from the controller.

## Unit Testing

### Functional Requirement 1

**Title:** Store Information Display

**Description:** The system shall display information of contracted stores such as address, phone number, etc.

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click a store

**Expected Results:** The store web page with address, phone number, etc. is displayed

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**Title:** Basic Item Information Display

**Description:** The system shall display basic information of items such as name, price, pictures, etc. when listing the items

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Search for an item

**Expected Results:** A list of items with name, price, pictures, etc. is displayed

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**Title:** Detailed Item Information Display

**Description:** The system shall display detailed information of items when user selects them

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click an item

**Expected Results:** The detailed information of the item is displayed

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**Title:** Browsing by Category

**Description:** The system shall enable user to browse produces by category

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click a category

**Expected Results:** The items of the specified category are listed

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**Title:** Searching Item

**Description:** The system shall enable user to search for items

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Search for an item

**Expected Results:** The relevant items are displayed

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**Title:** Sorting Item

**Description:** The system shall enable user to sort the search results based on relevancy, price, etc.

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Search for an item
3. Choose to sort by relevancy, price, etc.

**Expected Results:** The items are sorted in the specified order

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**Title:** Matching Results Maximum

**Description:** The system shall display at most 30 matching results on one page

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Search for an item with greater than 30 matching results

**Expected Results:** Only 30 matching results are display on one page.

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**Title:** No Matching Result

**Description:** The system shall notify user when no matching result is found and display options for similar produces

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Search for an item with no matching result

**Expected Results:** "No matching results" is displayed and show results for similar items

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## Functional Requirement 2

**Title:** Inventory Report Generation - Administrator

**Description:** A daily, weekly, monthly, and annual inventory report shall be generated

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The inventory is not empty for the period of time

**Test Steps:**

3. Click the "Manage" button in the administrator panel
4. Click the "Reports" button
5. Click the "Inventory Report" tab
6. Choose from "daily", "weekly", "monthly" and "annual"

**Expected Results:** The report on all the required inventory information for the specified period of time is displayed, including stock levels, stock values, etc.

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**Title:** Sales Report Generation - Administrator

**Description:** A daily, weekly, monthly, and annual sales report shall be generated

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The sales are not empty for the period of time

**Test Steps:**

1. Click the "Manage" button in the administrator panel
2. Click the "Reports" button
3. Click the "Sales Report" tab
4. Choose from "daily", "weekly", "monthly" and "annual"

**Expected Results:** The report on all the required sales information for the specified period of time is displayed, including cost of merchandise sold, returns, gross profit, margins, tax, etc.

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**Title:** Customer Report Generation - Administrator

**Description:** A semi-annual and annual customer report shall be generated for the head quarter and shall display customer purchasing behaviors

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The sales are not empty for the period of time

**Test Steps:**

1. Click the "Manage" button in the administrator panel
2. Click the "Reports" button
3. Click the "Customer Report" tab
4. Choose from "semi-annual " and "annual"

**Expected Results:** The report on customers’ purchasing behaviors for the specified period of time is displayed

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**Title:** Financial Report Generation - Administrator

**Description:** A quarterly and annual financial report shall be generated for the head quarter and shall display revenue, cost of goods sold, and operating expenses

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The sales are not empty for the period of time

**Test Steps:**

1. Click the "Manage" button in the administrator panel
2. Click the "Reports" button
3. Click the " Financial Report" tab
4. Choose from "quarterly" and "annual"

**Expected Results:** The financial report including revenue, cost of goods sold, operating expenses, etc. for the specified period of time is displayed

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**Title:** Authorized Access

**Description:** Access to the report shall be restricted to authorized users as listed on an administrative access control list

**Precondition:** The user is not logged into an administrator account for the store

**Assumption:** The administrative access control list is correct

**Test Steps:**

1. Click the "Manage" button in the administrator panel

2. Click the "Reports" button

**Expected Results:** Only the reports for the stores linked to the account are shown. No reports for other stores is displayed.

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### Functional Requirement 3

**Title:** Update Product Information - Administrator

**Description:** An administrator should be able to add or update information about a product such as price, coupons, and substitutions to the online store web page

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The administrator account is registered with the store

**Test Steps:**

3. Click the "Manage" button in the administrator panel
4. Click the "Products" button
5. Search for the products by ID
6. Add or update product information
7. Click the "Review Changes" button
8. Click "Save"

**Expected Results:** The item under the "Store Inventory" and on the store web page is updated

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**Title:** Update Payment Information - Administrator

**Description:** An administrator should be able to add or update payment information

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The administrator account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the administrator panel
2. Click the "Payment" button

3. Add or update payment information
4. Click the "Review Changes" button
5. Click "Save"

**Expected Results:** The payment information under the "Store Payment" and is updated

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**Title:** Update Customer Information - Administrator

**Description:** An administrator shall be able to add or update customer information

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The administrator account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the administrator panel
2. Click the "Customers" button
3. Search for the customer by ID
4. Add or update customer information
5. Click "Save"

**Expected Results:** The customer information on the customer list is updated

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**Title:** Update Employee Information - Administrator

**Description:** An administrator shall be able to add or update employee information

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** The administrator account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the administrator panel
2. Click the "Employees" button
3. Search for the employee by ID
4. Add or update employee information

5. Click "Save"

**Expected Results:** The employee information on the employee list is updated

### Functional Requirement 4

**Title:** Store Updating Information

**Description:** A registered store should be able to update information regarding to their store (Address, Hours, Phone, ect.)

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** a supported browser is being used

**Test Steps:**

1. Click the "manage" button in the administrator panel
2. Click the "Store Information" button
3. Enter the updated information as needed
4. Click the "Review Changes" button
5. Click "Save"

**Expected Results:** The "Store Information" page in the administrator panel should show the updated information per what the user wrote

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**Title:** Updating Unavailable Items

**Description:** A registered store should be able to update information about Unavailable items such as name, price, coupons and alternative items

**Precondition:** The user must be logged into an administrator account for the store

**Assumption:** a supported browser is being used

**Test Steps:**

1. Click the "manage" button in the administrator panel
2. Click the "Store Inventory" button

3. Sort by quantity available or search for unavailable item(s) in order to select the item(s) that need updating
4. Click "Edit Information" under the required item
5. Change value(s) as needed
6. Click the "Review Changes" button
7. Click "Save"

**Expected Results:** The selected item(s) under the "Store Inventory" should show the updated information

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### Functional Requirement 5

**Title:** Order Status - Employee

**Description:** An employee should be able to check the status of an order

**Precondition:** The user must be logged into an Employee account for the store

**Assumption:** Employee account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the Employee panel
2. Click the "Orders" button
3. Sort by time order was placed or search by order number to select an order
4. Click "Status" under the selected order

**Expected Results:** The selected order(s) should display information regarding the status of an order that was placed

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**Title:** Order Management - Employee

**Description:** An employee should be able to manage order(s)

**Precondition:** The user must be logged into an Employee account for the store

**Assumption:** Employee account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the Employee panel
2. Click the "Orders" button
3. Sort by time order was placed or search by order number to select an order
4. Click "Manage" under the selected order
5. Click "Edit Information" under the required order(s)
6. Change value(s) as needed
7. Click the "Review Changes" button
8. Click "Save"

**Expected Results:** The selected order(s) should display information regarding the order and reflect changes if any were made

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**Title:** Order Fulfillment - Employee

**Description:** An employee should be able to fulfill order(s)

**Precondition:** The user must be logged into an Employee account for the store

**Assumption:** Employee account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the Employee panel
2. Click the "Orders" button
3. Sort by time order was placed or search by order number to select an order
4. Click "Fulfill" under the selected order
5. Employee is then shown information regarding the order
6. Once the order is fulfilled, the employee clicks the "Order Fulfilled" Button
7. Click the "Review Order" button
8. Click "Save"

**Expected Results:** The selected order(s) should display that the order(s) were fulfilled and will be pending delivery under the "Status" button

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**Title:** Order Management - Employee

**Description:** An employee should be able to manage order(s)

**Precondition:** The user must be logged into an Employee account for the store

**Assumption:** Employee account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the Employee panel
2. Click the "Orders" button
3. Sort by time order was placed or search by order number to select an order
4. Click "Manage" under the selected order
5. Click "Edit Information" under the required order(s)
6. Change value(s) as needed
7. Click the "Review Changes" button
8. Click "Save"

**Expected Results:** The selected order(s) should display information regarding the order and reflect changes if any were made

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**Title:** Order Assignment - Employee

**Description:** An employee should be able to assign order(s) to drivers

**Precondition:** The user must be logged into an Employee account for the store

**Assumption:** Employee account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the Employee panel
2. Click the "Orders" button
3. Sort by "Orders Fulfilled" to select order(s)
4. Click "Assign Driver" under the selected order
5. Select driver to deliver the selected order(s)
6. Click the "Review Changes" button
7. Click "Save"

**Expected Results:** The selected order(s) should be sent to the selected driver(s) and the delivery process will begin

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**Title:** Delivery Status- Employee

**Description:** An employee should be able to check the status of Deliveries

**Precondition:** The user must be logged into an Employee account for the store

**Assumption:** Employee account is registered with the store

**Test Steps:**

1. Click the "Manage" button in the Employee panel
2. Click the "Orders" button
3. Sort by time order was placed or search by order number to select order(s)
4. Click "Status" under the selected order

**Expected Results:** The selected order(s) should display information regarding the order and reflect changes if any were made

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### Functional Requirement 6

**Title:** Store Page - Visitor

**Description:** A visitor shall be able to visit the store web page without registration

**Precondition:** The user is not logged into any accounts

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"

**Expected Results:** The Complete Foods Inc website is displayed

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**Title:** Choosing Store- Visitor

**Description:** A visitor shall be able to choose the store nearest to them on the web page by specifying their locations

**Precondition:** The user is not logged into any accounts and all cookies are cleared

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Stores" button
3. Enter either Zip Code, City, State, or The "Get Location Automatically" Button
4. Click the "Update Information" button
5. Select the store nearest to you

**Expected Results:** The Stores near the location specified should be outlined and shown on a map

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**Title:** Account Creation

**Description:** A visitor shall be able to create an account on the web page

**Precondition:** The user is not logged into any accounts

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Click the "Accounts" button on the Complete Foods website
2. Click the "Create Account" Button
3. Enter in information in the required fields
4. Click the checkbox to agree to our Terms of Use and Privacy Policy
5. Click the "Create Account Button"

**Expected Results:** The account for the user should be created and a confirmation email should be sent the the Email address specified while creating the account

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### Functional Requirement 7

**Title:** Account Information

**Description:** A user should be able to update personal information

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Manage Account" Button
4. Click the "Manage Information" Button
5. Edit information as needed
6. Click "Review Changes" button
7. Click "Save"

**Expected Results:** The newly updated information should be shown in the "Manage Account"section

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**Title:** Payment Information

**Description:** A user should be able to update payment information

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Manage Account" Button
4. Click the "Manage Payments" Button
5. Edit information as needed
6. Click "Review Changes" button
7. Click "Save"

**Expected Results:** The newly updated information should be shown in the "Manage Payments"section

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**Title:** Order History

**Description:** A user should be able to view their order history

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Orders" Button

**Expected Results:** The Users order history should be shown

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**Title:** Order Information

**Description:** A user should be able to view their order information

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Orders" Button
4. Sort by time order was placed or search by order number to select an order
5. Click "Information" under the selected order

**Expected Results:** All of the information about an order should be shown to the user

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## Functional Requirement 8

**Title:** Adding to Cart

**Description:** The customer shall be able to add items in stock to the cart

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Shop" button
3. Select a store of your choosing
4. Select an item to place in your cart
5. Select the quantity desired
6. Click the "Add to Cart" button

**Expected Results:** The selected item should be placed into the users cart

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**Title:** Changes In Cart

**Description:** The system shall notify user if there's a change in the cart such as when an item becomes out of stock or changes price.

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Shop" button
3. Select a store of your choosing
4. Select an item to place in your cart
5. Select the quantity desired
6. Click the "Add to Cart" button
7. While the item is in the cart, have a Store Administrator change either the Price or Quantity Available

**Expected Results:** An alert is generated to the user showing the changes made to the item by the Store Administrator

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**Title:** Store Page - Customer

**Description:** A Customer shall be able to visit the store web page before login

**Precondition:** The user is not logged into any accounts

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"

**Expected Results:** The Complete Foods Inc website is displayed

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**Title:** Account Login

**Description:** A visitor shall be able to login to their account on the web page

**Precondition:** The user is not logged into any accounts

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Click the "Accounts" button on the Complete Foods website
2. Click the "Sign In" Button
3. Enter in information in the required fields (Username/Email and Password)
4. Click the "Sign In" button

**Expected Results:** The user should be able to login to their account given they entered a Valid account ID and password

---

**Title:** Choosing Store- Customer

**Description:** A customer shall be able to choose the store nearest to them on the web page by specifying their location

**Precondition:** The user is on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Stores" button
3. Click the "Get Location Automatically" Button
4. Click the "Update Information" button

5. Select the store nearest to you

**Expected Results:** The Stores near the location specified should be outlined and shown on a map

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**Title:** Placing an Order

**Description:** A customer shall be able to place an order for delivery

**Precondition:** The user is logged into their account and has a store chosen

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Shop" button
3. Select item(s) to place in your cart
4. Select the quantity desired
5. Click the "Add to Cart" button
6. Click the "View Cart" button
7. Click the "Checkout" button
8. Choose a delivery method and time window
9. Choose payment method
10. Click the "Place Order" button

**Expected Results:** The customer should receive a confirmation and receipt email outlining the information from the order. The order information should be sent to the Store for processing.

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**Title:** Change Order Information - Customer

**Description:** The customer shall be able to change his/her orders before deliveries are processed

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used and the Delivery isn't being processed

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Orders" Button
4. Sort by time order was placed or search by order number to select an order
5. Click "Manage" under the selected order
6. Update order as needed
7. Click the "Review Changes" Button
8. Click the "Save" button

**Expected Results:** The information for the order should be changed and an email outlining the order shall be sent to the user. The updated order information should be sent to the store that is going to process it.

---

**Title:** Canceling an Order

**Description:** A user should be able to cancel their order

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Orders" Button
4. Sort by time order was placed or search by order number to select an order
5. Click "Manage" under the selected order
6. Click the "Cancel Order" button
7. Go through confirmation and click "Confirm Cancellation"

**Expected Results:** The order should be cancelled with the details being emailed to the Customer. The information should be sent to the store that was going to process the now canceled order.

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**Title:** Tracking Information - Customer

**Description:** A user should be able to view the tracking information for an order

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Accounts" button
3. Click the "Orders" Button
4. Sort by time order was placed or search by order number to select an order
5. Click "Information" under the selected order
6. Click "Tracking Information"

**Expected Results:** The tracking information for the specified order should be shown to the user.

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**Title:** Logout

**Description:** A user should be able to logout of their account

**Precondition:** The user is logged into his/her account on CompleteFoods.com

**Assumption:** A supported web browser is being used

**Test Steps:**

1. Navigate to "CompleteFoods.com"
2. Click the "Logout" Button

**Expected Results:** The user shall be logged out of the Complete Foods Inc website.

# Component Testing

**General Interface Testing Partitions**

- Interface calls with only required parameters provided.
- Interface calls with required and optional parameters provided.
- Interface calls with too many parameters provided.
- Interface calls with too few parameters provided.
- Interface calls with invalid or null pointers.
- Interface calls where parameter values are at the extreme ends of their range.
- Interface calls with typical parameter values.
- Interface calls where parameter values are invalid.

**Cloud-Server Component**

Test a public database object request for each object type.
Test a public database object request with an invalid unique resource identifier.
Test a public database object request with a null unique resource identifier.
Test a request for store information with a valid store identification number.
Test a request for store information with an invalid store identification number.
Test a request for purchase transaction with guest user.
Test a request for purchase transaction with recorded user with proper user credentials.
Test a request for purchase transaction with recorded user without proper user credentials.
Test a request by an employee to view a purchase transaction with proper credentials.
Test a request by an employee to view a purchase transaction without proper credentials.
Test a request by an employee to modify a purchase transaction with proper credentials.
Test a request by an employee to modify a purchase transaction without proper credentials.
Test a request by an employee to view a delivery request with proper credentials.
Test a request by an employee to view a delivery request without proper credentials.
Test a request by an employee to modify a delivery request with proper credentials.
Test a request by an employee to modify a delivery request without proper credentials.
Test a request to modify a database object with proper user credentials.
Test a request to modify a database object without proper user credentials.
Test a request to create a new user account.
Test a request to delete an existing user account.
Test a private database object request with proper user credentials.
Test a private database object request without proper user credentials.
Test a request to modify a user profile with proper user credentials.
Test a request to modify a user profile without proper user credentials.
Test a management report request with proper user credentials.
Test a management report request without proper user credentials.

**Cloud-Client Component**

Test issuing and consuming a public database object request for each object type.
Test issuing and consuming a public database object request with an invalid unique resource identifier.
Test issuing and consuming a public database object request with a null unique resource identifier.
Test issuing and consuming a request for store information with a valid store identification number.
Test issuing and consuming a request for store information with an invalid store identification number.
Test issuing and consuming a request for purchase transaction with guest user.
Test issuing and consuming a request for purchase transaction with recorded user with proper user credentials.
Test issuing and consuming a request for purchase transaction with recorded user without proper user credentials.

Test issuing and consuming a request by an employee to view a purchase transaction with proper credentials.
Test issuing and consuming a request by an employee to view a purchase transaction without proper credentials.
Test issuing and consuming a request by an employee to modify a purchase transaction with proper credentials.
Test issuing and consuming a request by an employee to modify a purchase transaction without proper credentials.
Test issuing and consuming a request by an employee to view a delivery request with proper credentials.
Test issuing and consuming a request by an employee to view a delivery request without proper credentials.
Test issuing and consuming a request by an employee to modify a delivery request with proper credentials.
Test issuing and consuming a request by an employee to modify a delivery request without proper credentials.
Test issuing and consuming a request to modify a database object with proper user credentials.
Test issuing and consuming a request to modify a database object without proper user credentials.
Test issuing and consuming a request to create a new user account.
Test issuing and consuming a request to delete an existing user account.
Test issuing and consuming a private database object request with proper user credentials.
Test issuing and consuming a private database object request without proper user credentials.
Test issuing and consuming a request to modify a user profile with proper user credentials.
Test issuing and consuming a request to modify a user profile without proper user credentials.
Test issuing and consuming a management report request with proper user credentials.
Test issuing and consuming a management report request without proper user credentials.

**Data-Security Component**
Test request to generate user credentials with correct login and password.
Test request to generate user credentials with invalid login and password.
Test request to create new login and password.
Test request to reset login or password.
Test frequent login attempts with invalid login and password.
Test request to sign out of user profile.

**Data-Model Component**
Test initializing each object type with the associated database objects.
Test initializing each object type with the associated database objects with extreme values.
Test initializing each object type with recently created database objects.
Test initializing each object type with invalid database objects.
Test initializing each object type with user generated data.
Test initializing each object type with user generated data with extreme values.
Test initializing each object type with invalid user generated data.
Test a request for an object which exists in local memory, for each object type.
Test a request for an object which does not exist in local memory, for each object type.
Test a request to modify each object type.
Test a request to delete each object type.
Test a request to access an object with an invalid unique resource identifier.

**Data-Controller Component**
Test a request for each object type generated by a user interaction.
Test a request for each object type generated by the system.
Test a request for an invalid object type generated by a user interaction.
Test a request for an invalid object type generated by the system.
Test a request for each object type where the data exists in local memory.

Test a request for each object type where the data does not exist in local memory.
Test a request to the cloud-client for remotely stored data.
Test returning fetched objects to the underlying view component.

**View Component**
Test each subview object conforms to proper layout on all display configurations.
Test each subview properly draws its content.
Test each user interface object initiates the proper request when engaged.
Test each subview properly updates its context when receiving fetched data from the controller.
Test each text-input interface with valid strings.
Test each text-input interface with invalid strings.
Test each text-input interface with no character data.
Test each user interaction is properly recorded by the view hierarchy.

## System Testing

### Black Box Testing

**System**: Complete Foods Inc. online grocery shopping application
**Use case**: Display information of a contracted store
**Actors**: User, cloud-server component, cloud-client component, data-model component, data-controller component, view component
**Data**: The view component sends the user's request of displaying information of a contracted store to the data-controller component. In the event the requested data is not in local memory, the data-controller component sends the request to the cloud-client component. The cloud-client component sends the request to the cloud-server component.
**Stimulus**: A request from view component
**Response**: The requested information is return to view component
**Comments**: Merchandise information is usually requested the same way as displaying information of a contracted store.

**System**: Complete Foods Inc. online grocery shopping application
**Use case**: Generate report
**Actors**: User, cloud-server component, cloud-client component, data-security component, data-model component, data-controller component, view component
**Data**: the user is authenticated in the data-security component. The view component sends the user's generating report command to the data-controller component. The data-controller component sends the request to the cloud-client component. The cloud-client component sends the request to the cloud-server component.
**Stimulus**: A command from the view component
Response: A report is generated and return to view component.
Comments: Merchandise and/or employee records, order process, and webpage update is usually processed the same way as generating report.

**System**: Complete Foods Inc. online grocery shopping application
**Use case**: Place order
**Actors**: User, cloud-server component, cloud-client component, data-security component, data-model component, data-controller component, view component
**Data**: The user is authenticated in data-security component. The view component sends the user's request to the data-controller component. The data-controller component sends the request to the cloud-client component. The cloud-client component sends the request to the cloud-server component.
**Stimulus**: A request from view component
**Response**: A confirmation is returned displaying the status of the order

Comments: Account register and order or profile update is usually processed the same way as placing order.

### Scenario Testing

Emily is a fanatical online shopper. One day, she searches nearby online stores through Google engine. Complete Foods Inc. is popped out in the searching results. Emily then click on the company link. The web page of the contracted store is loaded in her iPhone in 3 seconds. She randomly browses items and searches items she is intended to. Finally, she finds the item she likes and adds it to the shopping cart. She is prompted to register an account when she tries to check out. She registers an account, fill in shipping address and payment information, reviews order summary, and click on the Place your order button. A prompt is display to Emily showing the status of the order and a confirmation text and email is sent to her iPhone and email respectively.

### Performance Testing

Verify response time of the system is not more than 2 seconds under low, normal, moderate, and extreme load of simultaneous user access.

Verify 975 of visible web pages is loaded in no more than 6 seconds under slow and normal network connectivity.

Check the maximum number of users the system is able to support before crashing.