- **Password Hashing**

  - **Description**: Passwords from Signup.aspx are hashed (e.g., using bcrypt) before storing in CUSTOMER_T to prevent plaintext exposure. This protects user credentials if the database is breached.

- **SQL Injection Prevention**

  - **Description**: Parameterized queries (e.g., AddWithValue in PlaceOrder.aspx.vb, Login.aspx.vb) prevent attackers from injecting malicious SQL code, securing database operations.

- **Session Management**

  - **Description**: Session variables (Session("RoleName"), Session("CUSTOMER_ID")) ensure only authenticated customers access pages like PlaceOrder.aspx and ViewOrders.aspx, with redirects to Login.aspx for unauthorized users.

- **Input Validation**

  - **Description**: User inputs (e.g., email in Signup.aspx, payment method in PlaceOrder.aspx) are validated for format and emptiness to block malicious or invalid data, reducing attack risks.

- **Role-Based Access**

  - **Description**: Checks for Session("RoleName") = "Customer" in Page_Load (e.g., CustomerDashboard.aspx.vb) restrict access to customer-only pages, preventing unauthorized use.

- **HTTPS Encryption**

  - **Description**: HTTPS encrypts data between the browser and server, protecting sensitive information like passwords and order details during transmission across all pages.

- **Error Handling**

  - **Description**: Try-catch blocks (e.g., in PlaceOrder.aspx.vb) display generic error messages to users and log details securely, preventing exposure of sensitive system information.

- **User Authentication with Correct Credentials**

This feature ensures that only users with valid credentials (email and password) can log in to the system, preventing unauthorized access.

TEST CASES:

Input Validation:

Customer Sign Up

Name

musa123

Contact Number

03026421238

Email

musa@gmail.com

City

Gojra

State

Punjab

Postal Code

56789

Street Address

Mehdi Mohallah Gojra

User ID

musa111

Password

Password

Sign Up

Customer Name is required, letters/spaces only, max 40 chars.

Contact Number

0302642123

Sign Up

Customer Contact is required, exactly 11 digits.

Email

musa@gmail.c

Sign Up

Customer Email is required and must be valid.

City

Gojra123

Sign Up

City is required, letters/spaces only, max 20 chars.

Postal Code

56789a

Sign Up

Postal Code is required, numeric only, max 10 digits.

musa111

Password

Password

Sign Up

Password is required and must be ≥ 10 chars with ≥ 4 special, ≥ 4 digits, ≥ 2 letters.

User Authentication with Correct Credentials

Sign in to SCM System

User ID

musa111

Password

Sign In

Invalid credentials.

Password Hashing

Here password is Hashed for each user to increase security

	USER_ID	USERNAME	PASSWORD_HASH	SALT	ROLE_ID	CREATED_ON	CUSTOMER_ID	SUPPLIER_ID
1	1	musaf	Dw1vhwnzt1vkYBZI+/D3UfkZL0X3qDBJKmvpYHpPlps=	9IDhrDxi4YPmKojh0o8rrdGh+oZ2WaR+0CubReCZ2wc=	2	NULL	NULL	2004
2	2	ali123	0+AF/YiaHOrHpb88H3RWjYm96bvErim+I6Sd2jv/8cs=	R7IQPiPx8qYsR0udYRRaifcRuwSm65PTIDYYIKGH/f4=	3	NULL	111	NULL
3	3	musa111	ZOI25QhZTi7NDUNx7kssBdI4xXoHOx4XsIBNW/Lo2Jc=	yU2V2fNFrIUn5gdpaBOQPWY74vXuiuyObMT/hvO0IOM=	3	NULL	112	NULL
4	4	sam123	6NpD7i6VKV5lplvGBY5Bp7vR+i5bZ7S2lvg9fvwuUhU=	wpHZNkuATC7Vr2bAsSeeI1SkMHg24mFEByBK/ilnQnk=	2	NULL	NULL	2005

Session Management

Ensure only authenticated customers access pages like PlaceOrder.aspx and ViewOrders.aspx, with redirects to Login.aspx for unauthorized users.

SCM Login

Sign in to SCM System

User ID

musa111

Password

••••••••••

Sign In

Create New Account

--- SCM 2025 ---

Customer Dashboard

Welcome, Muhammad Musa

Update Profile | View Products | Place Order | View Orders

Error Handling

Place Order

Please select a product and quantity.

Back to Dashboard

Select Product:

Select Product ⌄

Select Quantity:

Select Quantity ⌄

Add to Order

Selected Products:

Payment Method:

Select Method ⌄

Place Order

SQL Injection Prevention

```vb
Using cmdSup As New SqlCommand(sqlSup, con, tran)
    cmdSup.Parameters.AddWithValue("@id", newEntityId)
    cmdSup.Parameters.AddWithValue("@fn", txtFirstName.Text.Trim())
    cmdSup.Parameters.AddWithValue("@ln", txtLastName.Text.Trim())
    cmdSup.Parameters.AddWithValue("@em", txtEmail.Text.Trim())
    cmdSup.Parameters.AddWithValue("@city", txtCity.Text.Trim())
    cmdSup.Parameters.AddWithValue("@st", txtState.Text.Trim())
    cmdSup.Parameters.AddWithValue("@postal", txtPostalCode.Text.Trim())
    cmdSup.Parameters.AddWithValue("@street", txtStreetAddress.Text.Trim())
    cmdSup.ExecuteNonQuery()
End Using
```