

## 7 Testing and Evaluation

### 7.1 Unit Testing

**Unit Testing 1:** Verify creation of user type

**Testing Objective:** To ensure that correct user type is created

**Test Case Id:** TC\_001

Table 78 Test Case Id: TC\_001

| No. | Test case/Test script                              | Attribute and value      | Expected result                                | Actual Result                                  | Result |
|-----|--|--------------------------|--|--|--------|
| 1   | Verify that the user type is created successfully. | User type = "Shop Owner" | User type "Shop Owner" is created successfully | User type "Shop Owner" is created successfully | Pass   |
| 2   | Verify that the user type is created successfully. | User type = "Employee"   | User type "Employee" is created successfully   | User type "Employee" is created successfully   | Pass   |

## Unit Testing 2: User account creation

**Testing Objective:** To ensure that correct user account is created.

**Test Case Id:** TC\_002

Table 79 Test Case Id: TC\_002

| No. | Test case/Test script                                 | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | Verify that a user account is created successfully.   | Full Name = "Muhammad Azfar",<br>Email = " <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> ",<br>User Type = "Employee",<br>Password = "abc123" | User account for John Doe is created successfully.              | User account for John Doe is created successfully.              | Pass   |
| 2   | Verify that an invalid email address is not accepted. | Full Name = "Syed Danish", Email = " <a href="mailto:Danish">Danish</a> ", User Type = "Shop Owner", Password = "abc123"                               | Error message is displayed indicating an invalid email address. | Error message is displayed indicating an invalid email address. | Pass   |

## Unit Testing 3: View User Account

**Testing Objective:** To ensure that correct user account information is displayed.

**Test Case Id:** TC\_003

Table 80 Test Case Id: TC\_003

| No. | Test case/Test script                                  | Attribute and value   | Expected result   | Actual Result   | Result |
|-----|--|---|---|---|--------|
| 1   | Verify that the user accounts are displayed correctly. | User Account Data (Full Name, Email, User Type) = [Muhammad Azfar, <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> , Employee], [Syed Danish, <a href="mailto:danish@gmail.com">danish@gmail.com</a> , Shop Owner] | User accounts for Muhammad Azfar and Syed Danish are displayed correctly. | User accounts for Muhammad Azfar and Syed Danish are displayed. | Pass   |

#### Unit Testing 4: Edit User Account

**Testing Objective:** To ensure that edited data is properly saved and executed.

**Test Case Id:** TC\_004

Table 81 Test Case Id: TC\_004

| No. | Test case/Test script  | Attribute and value  | Expected result  | Actual Result  | Result |
|-----|--|--|--|--|--------|
| 1   | Verify that the user account details are pre-filled correctly. | (Full Name, Email, User Type, Password) = [Muhammad Azfar, azfar1@gmail.com, Employee, abc123]   | The Full Name, Email, User Type, and password fields are pre-filled with the corresponding user account details. | The Full Name, Email, User Type, and password fields are pre-filled with the corresponding user account details. | Pass   |
| 2   | Verify that the user account is updated successfully.          | (Full Name, Email, User Type, Password) = [Muhammad Danish, danish@gmail.com, ShopOwner, abc123] | User account details for Syed Danish are updated to Muhammad Danish successfully                                 | User account details for Syed Danish are updated to Muhammad Danish successfully                                 | Pass   |

## Unit Testing 5: Delete User Account

**Testing Objective:** To ensure that admin deletion of user account feature works and is executed properly

**Test Case Id:** TC\_005

Table 82 Test Case Id: TC\_005

| No. | Test case/Test script  | Attribute and value                            | Expected result                   | Actual Result                     | Result |
|-----|--|--|-----------------------------------|-----------------------------------|--------|
| 1   | The Admin logs into the dashboard  | (Email, Password) = [azfar1@gmail.com, abc123] | Admin successfully logged in.     | Admin successfully logged in.     | Pass   |
| 2   | The Admin clicks View User Account.  | Single Click                                   | User account screen displayed     | User account screen displayed     | Pass   |
| 3   | The Admin clicks on the delete icon for the desired user account required to be deleted. | Single Click                                   | User account deleted successfully | User account deleted successfully | Pass   |

## Unit Testing 6: Edit Admin Account

**Testing Objective:** To ensure that admin successfully updates their account.

**Test Case Id:** TC\_006

Table 83 Test Case Id: TC\_006

| No. | Test case/Test script                                     | Attribute and value                            | Expected result                         | Actual Result                           | Result |
|-----|---|--|---|---|--------|
| 1   | The Admin logs into the dashboard                         | (Email, Password) = [azfar1@gmail.com, abc123] | Admin successfully logged in.           | Admin successfully logged in.           | Pass   |
| 2   | The Admin clicks on settings icon.                        | Single Click                                   | Admin edit screen is displayed          | Admin edit screen is displayed          | Pass   |
| 3   | The Admin clicks on update password button.               | Single Click                                   | Password fields enabled                 | Password fields enabled                 | Pass   |
| 4   | The Admin edits their password                            | Password: abc123                               | Password Written                        | Password Written                        | Pass   |
| 5   | The Admin again writes password in confirm password field | Password: abc123                               | Confirm Password Field Password Written | Confirm Password Field Password Written | Pass   |
| 6   | The Admin clicks on Update Profile button                 | Single Click                                   | Admin details updated successfully      | Admin details updated successfully      | Pass   |

## Unit Testing 7: Face Detection

**Testing Objective:** To ensure that employee face detection works and is executed properly.

**Test Case Id:** TC\_007

Table 84 Test Case Id: TC\_007

| No. | Test case/Test script                     | Attribute and value | Expected result  | Actual Result  | Result |
|-----|---|---------------------|--|--|--------|
| 1   | The User clicks on mark attendance        | Single Click        | The system navigates the user to the attendance screen       | The system navigates the user to the attendance screen       | Pass   |
| 2   | The User brings face in front of screen   | Detect Face         | System has the face image correctly placed                   | System has the face image correctly placed                   | Pass   |
| 3   | The User remains still for face detection | Detect Face         | System detects employee face                                 | System detects employee face                                 | Pass   |
| 4   | The User waits for face detection         | Detect Face         | System makes a box shape around the detected employee face   | System makes a box shape around the detected employee face   | Pass   |
| 5   | The User checks attendance status         | Check Attendance    | System displays Attendance Marked Successfully               | System displays Attendance Marked Successfully               | Pass   |
| 6   | The User views attendance                 | View Attendance     | System displays total attendance and year of marked employee | System displays total attendance and year of marked employee | Pass   |

**Unit Testing 8: Face Detection** already marked

**Testing Objective:** To ensure that no multiple detection take place for an employee at the same time.

**Test Case Id: TC\_008**

Table 85 Test Case Id: TC\_008

| No. | Test case/Test script                        | Attribute and value     | Expected result  | Actual Result  | Result |
|-----|--|-------------------------|--|--|--------|
| 1   | The User clicks on mark attendance           | Single Click            | The system navigates the user to the attendance screen       | The system navigates the user to the attendance screen       | Pass   |
| 2   | The User brings face in front of screen      | Detect Face             | System has the face image correctly placed                   | System has the face image correctly placed                   | Pass   |
| 3   | The User remains still for face detection    | Detect Face             | System detects employee face                                 | System detects employee face                                 | Pass   |
| 4   | The User waits for face detection            | Detect Face             | System makes a box shape around the detected employee face   | System makes a box shape around the detected employee face   | Pass   |
| 5   | The User checks attendance status            | Check Attendance        | System displays Attendance Marked Successfully               | System displays Attendance Marked Successfully               | Pass   |
| 6   | The User remains still looking in the camera | Check Attendance Status | System displays Attendance Already Marked                    | System displays Attendance Already Marked                    | Pass   |
| 7   | The User views attendance                    | View Attendance         | System displays total attendance and year of marked employee | System displays total attendance and year of marked employee | Pass   |

### Unit Testing 9: View Attendance

**Testing Objective:** To ensure that both Employee and Shop Owner can properly view their attendance.

**Test Case Id:** TC\_009

Table 86 Test Case Id: TC\_009

| No. | Test case/Test script                               | Attribute and value              | Expected result  | Actual Result  | Result |
|-----|---|----------------------------------|--|--|--------|
| 1   | The User enters username                            | Username: azfariqbal01@gmail.com | The system identifies as a registered and valid email        | The system identifies as a registered and valid email        | Pass   |
| 2   | The User enters password and press the login button | Password: abc123<br>Single Click | User is logged in the application and dashboard is displayed | User is logged in the application and dashboard is displayed | Pass   |
| 3   | The User clicks on View Attendance                  | Single Click                     | User Attendance is displayed                                 | User Attendance is displayed                                 | Pass   |



## Unit Testing 10: Edit Profile

**Testing Objective:** To ensure that both shop owner and employee are able to successfully edit their profile.

**Test Case Id: TC\_010**

Table 87 Test Case Id: TC\_010

| No. | Test case/Test script   | Attribute and value  | Expected result                                      | Actual Result  | Result |
|-----|---|--|--|--|--------|
| 1   | The User logs into the application                                | Username: <a href="mailto:azfariqbal01@gmail.com">azfariqbal01@gmail.com</a><br>Password: abc123 | Login is successful                                  | Login is successful                                  | Pass   |
| 2   | The User clicks on edit profile                                   | Single click   | System navigates the user to the edit profile screen | System navigates the user to the edit profile screen | Pass   |
| 3   | The User enters new password and again enters in confirm password | Password: abcd123  | System updates password field                        | System updates password field                        | Pass   |
| 4   | The User clicks on Reset Password                                 | Single Click   | A pop-up appears asking to confirm password reset    | A pop-up appears asking to confirm password reset    | Pass   |
| 5   | The User clicks OK  | Single Click   | System displays Password reset successfully          | System displays Password reset successfully          | Pass   |

## Unit Testing 11: Help & Support

**Testing Objective:** To ensure that both shop owner and employee are able to successfully contact help & Support.

**Test Case Id: TC\_011**

Table 88 Test Case Id: TC\_011

| No. | Test case/Test script                      | Attribute and value  | Expected result  | Actual Result  | Result |
|-----|--|--|--|--|--------|
| 1   | The User logs into the application         | Username: <a href="mailto:azfariqbal01@gmail.com">azfariqbal01@gmail.com</a><br>Password: abc123 | Login is successful                                    | Login is successful                                    | Pass   |
| 2   | The User clicks on settings                | Single click   | System navigates the user to the settings screen       | System navigates the user to the settings screen       | Pass   |
| 3   | The User clicks on Help & Support          | Single Click   | Support screen is displayed                            | Support screen is displayed                            | Pass   |
| 4   | The User clicks on the help contact number | Button Click   | System prompts the user to make call                   | System prompts the user to make call                   | Pass   |
| 5   | The User clicks OK                         | Single Click   | System redirects the user to the built-in phone dialer | System redirects the user to the built-in phone dialer | Pass   |
| 6   | The User clicks on the call icon           | Button Click   | A call is sent to the help phone number by the user    | A call is sent to the help phone number by the user    | Pass   |

## Unit Testing 12: Forgot Password

**Testing Objective:** To ensure that user can change password if forgotten.

**Test Case Id:** TC\_012

Table 89 Test Case Id: TC\_012

| No. | Test case/Test script              | Attribute and value           | Expected result  | Actual Result  | Result |
|-----|------------------------------------|-------------------------------|--|--|--------|
| 1   | The User clicks on forgot password | Single Click                  | System directs the user to the Forgot Password page          | System directs the user to the Forgot Password page          | Pass   |
| 2   | The User writes his email          | Email: azfariqbal01@gmail.com | The system updates email field                               | The system updates email field                               | Pass   |
| 3   | The User writes the OTP            | OTP: 123456                   | The system validates the OTP and navigates user to home page | The system validates the OTP and navigates user to home page | Pass   |

### Unit Testing 13: Notifications

**Testing Objective:** To ensure that the system notifies the user about activities.

**Test Case Id:** TC\_013

Table 90 Test Case Id: TC\_013

| No. | Test case/Test script  | Attribute and value | Expected result   | Actual Result   | Result |
|-----|--|---------------------|---|---|--------|
| 1   | The User clicks on notification button   | Single Click        | The System prompts a notifications bar                          | The System prompts a notifications bar                          | Pass   |
| 2   | The User clicks on notification  | Single Click        | The system navigates the user to notifications page             | The system navigates the user to notifications page             | Pass   |
| 3   | The User clicks on delete button to remove the notification from notification page | Single Click        | The system deletes the notifications from the notification page | The system deletes the notifications from the notification page | Pass   |

## Unit Testing 14: Live Surveillance

**Testing Objective:** To ensure that the shop owner is able to view live surveillance successfully.

**Test Case Id:** TC\_014

Table 91 Test Case Id: TC\_014

| No. | Test case/Test script                | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|--------------------------------------|--|---|---|--------|
| 1   | The User logs into the application   | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays user dashboard                                      | System displays user dashboard                                      | Pass   |
| 2   | The User clicks on live surveillance | Single Click   | The system navigates the user live surveillance screen              | The system navigates the user live surveillance screen              | Pass   |
| 3   | The User clicks on full screen icon  | Single Click   | The system displays live surveillance to the shop owner from device | The system displays live surveillance to the shop owner from device | Pass   |

## Unit Testing 15: Recorded Tapes

**Testing Objective:** To ensure that the shop owner is able to view recorded tapes of live surveillance successfully.

**Test Case Id: TC\_015**

Table 92 Test Case Id: TC\_015

| No. | Test case/Test script  | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|--|--|---|---|--------|
| 1   | The User logs into the application.                                | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays user dashboard                                | System displays user dashboard                                | Pass   |
| 2   | The User clicks on Recorded Tapes.                                 | Single Click   | The system navigates the user recorded tapes screen           | The system navigates the user recorded tapes screen           | Pass   |
| 3   | The User clicks on Tap to View Button.                             | Button Click   | The system redirects the user to cloudinary login page        | The system redirects the user to cloudinary login page        | Pass   |
| 4   | The User clicks on desired recording tape from the available ones. | Single Click   | The system starts to play the desired selected recording tape | The system starts to play the desired selected recording tape | Pass   |

### Unit Testing 16: Display Employees

**Testing Objective:** To ensure that the shop owner is able to view live surveillance successfully.

**Test Case Id:** TC\_016

Table 93 Test Case Id: TC\_016

| No. | Test case/Test script              | Attribute and value  | Expected result                                | Actual Result                                  | Result |
|-----|------------------------------------|--|--|--|--------|
| 1   | The User logs into the application | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays user dashboard                 | System displays user dashboard                 | Pass   |
| 2   | The User clicks on All Employees   | Single Click   | The system navigates the user to Employee List | The system navigates the user to Employee List | Pass   |

### Unit Testing 17: View Employee Attendance

**Testing Objective:** To ensure that the shop owner is able to view Employee Attendance successfully.

**Test Case Id:** TC\_017

Table 94 Test Case Id: TC\_017

| No. | Test case/Test script  | Attribute and value  | Expected result  | Actual Result                                  | Result |
|-----|--|--|--|--|--------|
| 1   | The User logs into the application                               | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays user dashboard                         | System displays user dashboard                 | Pass   |
| 2   | The User clicks on All Employees                                 | Single Click   | The system navigates the user to Employee List         | The system navigates the user to Employee List | Pass   |
| 3   | The User clicks on Click to View Button for the desired employee | Single Click   | The system display attendance of the specific employee | The system display attendance of the employee  | Pass   |

## Unit Testing 18: Detect Pistol

**Testing Objective:** To ensure that the System is able to detect pistol of intruder successfully.

**Test Case Id:** TC\_018

Table 95 Test Case Id: TC\_018

| No. | Test case/Test script                           | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application               | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User places a pistol in front of the screen | Pistol   | The system detects the object as a pistol and marks a box around it with the pistol label | The system detects the object and marks a box around it with the pistol label | Pass   |



## Unit Testing 19: Detect Trespasser

**Testing Objective:** To ensure that the System is able to detect trespassing intruder successfully.

**Test Case Id:** TC\_019

Table 96 Test Case Id: TC\_019

| No. | Test case/Test script                     | Attribute and value  | Expected result  | Actual Result  | Result |
|-----|---|--|--|--|--------|
| 1   | The User launches the application         | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture  | System displays Video Capture  | Pass   |
| 2   | The User selects Region of Interest (ROI) | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that region                 | System recognizes ROI and proceeds to detect trespasser in that region                 | Pass   |
| 3   | The User stays visible by the camera      | Trespasser/Person  | The system detects the human as a person and marks a box around them with person label | The system detects the human as a person and marks a box around them with person label | Pass   |

## Unit Testing 20: Detect Trespasser with incorrect ROI

**Testing Objective:** To ensure that the only detects trespassing intruder in the ROI.

**Test Case Id:** TC\_020

Table 97 Test Case Id: TC\_020

| No. | Test case/Test script   | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application   | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User selects Region of Interest (ROI) outside of the intruder's present region. | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that region      | System recognizes ROI and proceeds to detect trespasser in that region      | Pass   |
| 3   | The User stays visible by the camera  | Trespasser/Person  | The system is unable to detect the person as he is standing outside the ROI | The system is unable to detect the person as he is standing outside the ROI | Pass   |

## Unit Testing 21: Record Weapon Detection Video

**Testing Objective:** To ensure that the System is able to record video of weapon detection successfully.

**Test Case Id: TC\_021**

Table 98 Test Case Id: TC\_021

| No. | Test case/Test script                           | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application               | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User clicks on weapon detection             | Single Click   | The system starts to record the video capture   | The system starts to record the video capture   | Pass   |
| 3   | The User places a pistol in front of the screen | Pistol   | The system detects the object as a pistol and marks a box around it with the pistol label | The system detects the object as a pistol and marks a box around it with the pistol label | Pass   |

## Unit Testing 22: Save Weapon Detection Video

**Testing Objective:** To ensure that the System is able to save video of weapon detection successfully.

**Test Case Id: TC\_022**

Table 99 Test Case Id: TC\_022

| No. | Test case/Test script                           | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application               | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User places a pistol in front of the screen | Pistol   | The system detects the object as a pistol and marks a box around it with the pistol label | The system detects the object as a pistol and marks a box around it with the pistol label | Pass   |
| 3   | The User closes the application                 | Single Click   | The system saves the recorded video inside the directory chosen by the user               | The system saves the recorded video inside the directory chosen by the user               | Pass   |

### Unit Testing 23: Upload Weapon Detection Video

**Testing Objective:** To ensure that the System is able to upload video of weapon detection on cloundinary server successfully.

**Test Case Id: TC\_023**

Table 100 Test Case Id: TC\_023

| No. | Test case/Test script                           | Attribute and value  | Expected result  | Actual Result  | Result |
|-----|---|--|--|--|--------|
| 1   | The User launches the application               | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays Video Capture  | System displays Video Capture  | Pass   |
| 2   | The User clicks on weapon detection             | Single Click   | The system starts to record the video capture  | The system starts to record the video capture  | Pass   |
| 3   | The User places a pistol in front of the screen | Pistol   | The system detects the object as a pistol and marks a box around it  | The system detects the object as a pistol and marks a box around it  | Pass   |
| 4   | The User closes the application                 | Single Click   | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloundinary | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloundinary | Pass   |

## Unit Testing 24: Record Trespasser Detection Video

**Testing Objective:** To ensure that the System is able to record video of trespassing detection successfully.

**Test Case Id:** TC\_024

Table 101 Test Case Id: TC\_024

| No. | Test case/Test script                     | Attribute and value  | Expected result  | Actual Result  | Result |
|-----|---|--|--|--|--------|
| 1   | The User launches the application         | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays Video Capture  | System displays Video Capture  | Pass   |
| 2   | The User clicks on trespassing detection  | Single Click   | The system starts to record the video capture  | The system starts to record the video capture  | Pass   |
| 3   | The User selects Region of Interest (ROI) | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that area                       | System recognizes ROI and proceeds to detect trespasser in that area                       | Pass   |
| 4   | The User stays visible by the camera      | Detect Trespasser  | The system detects the human as a person and marks a box around them with the person label | The system detects the human as a person and marks a box around them with the person label | Pass   |

## Unit Testing 25: Save Trespasser Detection Video

**Testing Objective:** To ensure that the System is able to save video of trespassing detection successfully.

**Test Case Id:** TC\_025

Table 102 Test Case Id: TC\_025

| No. | Test case/Test script                     | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application         | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User selects Region of Interest (ROI) | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that region      | System recognizes ROI and proceeds to detect trespasser in that region      | Pass   |
| 3   | The User closes the application           | Single Click   | The system saves the recorded video inside the directory chosen by the user | The system saves the recorded video inside the directory chosen by the user | Pass   |

## Unit Testing 26: Upload Trespasser Detection Video

**Testing Objective:** To ensure that the System is able to upload video of trespassing detection on cloudinary server successfully.

**Test Case Id: TC\_026**

Table 103 Test Case Id: TC\_026

| No. | Test case/Test script                     | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application         | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User clicks on trespassing detection  | Single Click   | The system starts to record the video capture   | The system starts to record the video capture   | Pass   |
| 3   | The User selects Region of Interest (ROI) | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that region  | System recognizes ROI and proceeds to detect trespasser in that region  | Pass   |
| 4   | The User stays visible by the camera      | Detect Trespasser  | The system detects the human as a person and marks a box around them  | The system detects the human as a person and marks a box around them  | Pass   |
| 5   | The User closes the application           | Single Click   | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloudinary | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloudinary | Pass   |



## 7.2 Functional Testing

Functional test cases are given below:

**Functional Testing 1:** Check deletion and editing of user type

**Objective:** To ensure that the deletion and editing user type functionality works

**Test Case Id:** TC\_001

Table 104 Functional Test Case Id: TC\_001

| No. | Test case/Test script   | Attribute and value             | Expected result  | Actual result  | Result |
|-----|---|---------------------------------|--|--|--------|
| 1.  | Verify that a user type can be deleted.                           | User type = "Shop Owner"        | User type "Shop Owner" is deleted successfully.                          | User type "Shop Owner" is deleted successfully.                          | Pass   |
| 2.  | Verify that a user type can be edited.                            | User type = "Employee"          | User type "Employee" is updated successfully.                            | User type "Employee" is updated successfully.                            | Pass   |
| 3.  | Verify that an invalid user type cannot be created.               | User type = "Invalid User Type" | Error message is displayed indicating invalid user type.                 | Error message is displayed indicating invalid user type.                 | Pass   |
| 4.  | Verify that deleting a user type removes associated user records. | User type = "Shop Owner"        | All user records associated with the "Shop Owner" user type are deleted. | All user records associated with the "Shop Owner" user type are deleted. | Pass   |

**Functional Testing 2:** Verify successful account creation.**Objective:** To ensure that the deletion and editing user type functionality works**Test Case Id:** TC\_002**Table 105 Functional Test Case Id: TC\_002**

| No. | Test case/Test script  | Attribute and value  | Expected result   | Actual result   | Result |
|-----|--|--|---|---|--------|
| 1.  | Verify that the "Create User Account" button is disabled until all required fields are filled. | Full Name = "",<br>Email = " <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> ",<br>User Type = "Employee",<br>Password = "abc123"               | The "Create User Account" button remains disabled until a Full name is entered.                   | The "Create User Account" button remains disabled until a Full name is entered.                   | Pass   |
| 2.  | Verify that the user account creation is successful with all valid input data.                 | Full Name = "Muhammad Azfar",<br>Email = " <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> ",<br>User Type = "Employee",<br>Password = "abc123" | User account for Muhammad Azfar is created successfully.  | User account for Muhammad Azfar is created successfully.  | Pass   |
| 3.  | Verify that the password meets the required complexity criteria.                               | Full Name = "Muhammad Azfar",<br>Email = " <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> ",<br>User Type = "Employee",<br>Password = "aaaaaa" | Error message is displayed indicating that the password does not meet the complexity requirements | Error message is displayed indicating that the password does not meet the complexity requirements | Pass   |

**Functional Testing 3:** Verify delete and edit user account functions.

**Objective:** To ensure that the delete and edit functions are valid.

**Test Case Id:** TC\_003

Table 106 Functional Test Case Id: TC\_003

| No. | Test case/Test script   | Attribute and value   | Expected result   | Actual result   | Result |
|-----|---|---|---|---|--------|
| 1.  | Verify that a user account can be deleted                                       | User Account Data = [Muhammad Azfar, <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> , Employee] | User account for Muhammad Azfar is deleted successfully   | User account for Muhammad Azfar is deleted successfully   | Pass   |
| 2.  | Verify that a user account can be edited.                                       | User Account Data = [Syed Danish, <a href="mailto:danish@gmail.com">danish@gmail.com</a> , Shop Owner]  | User account details for Syed Danish is updated successfully.   | User account details for Syed Danish is updated successfully.   | Pass   |
| 3.  | Verify that deleting a user account prompts for confirmation.                   | User Account Data = [Muhammad Azfar, <a href="mailto:azfar1@gmail.com">azfar1@gmail.com</a> , Employee] | Confirmation dialog is displayed before deleting the user account   | Confirmation dialog is displayed before deleting the user account   | Pass   |
| 4.  | Verify that editing a user account redirects to the "Edit User Account" screen. | User Account Data = [Syed Danish, <a href="mailto:danish@gmail.com">danish@gmail.com</a> , Shop Owner]  | Clicking on the "Edit" action for Syed Danish's user account opens the "Edit User Account" screen with pre-filled data. | Clicking on the "Edit" action for Syed Danish's user account opens the "Edit User Account" screen with pre-filled data. | Pass   |

**Functional Testing 4:** Verify edit account details.**Objective:** To ensure that the account is edited successfully.**Test Case Id:** TC\_004**Table 107 Functional Test Case Id: TC\_004**

| No. | Test case/Test script   | Attribute and value  | Expected result   | Actual result   | Result |
|-----|---|--|---|---|--------|
| 1.  | Verify that the user account can be updated with a new password.  | (Full Name, Email, User Type, Password) = [Muhammad Azfar, azfar1@gmail.com, Employee, xyz123]   | User account details for Muhammad Azfar, including the password, are updated successfully.  | User account details for Muhammad Azfar, including the password, are updated successfully.  | Pass   |
| 2.  | Verify that an error message is displayed when attempting to update the user account with incomplete or invalid data. | (Full Name, Email, User Type, Password) = [Syed Danish, “ ”, ShopOwner, abc123]                  | Error message is displayed indicating that a required field (Email) is missing or invalid, preventing the update of the user account. | Error message is displayed indicating that a required field (Email) is missing or invalid, preventing the update of the user account. | Pass   |
| 3.  | Verify that the "Update" button is enabled and functional when all required fields are filled with valid data.        | (Full Name, Email, User Type, Password) = [Syed Danish, “danish11@gmail.com”, ShopOwner, abc123] | The "Update" button is enabled and clicking it successfully updates the user account with the modified details.                       | The "Update" button is enabled and clicking it successfully updates the user account with the modified details.                       | Pass   |

### Functional Testing 5: Sign-Up as Admin with valid/invalid credentials

**Testing Objective:** To ensure that the Sign-Up form is working correctly with valid and invalid credentials.

**Test Case Id: TC\_05**

Table 108 Test Case Id: TC\_05

| No. | Test case/Test script  | Attribute and value  | Expected result                         | Actual Result                           | Result |
|-----|--|--|---|---|--------|
| 1   | System allows user to register if they are not registered already.   | Register link on the login page.   | Register link displayed on login page   | Register link displayed on login page   | Pass   |
| 2   | If the user is not registered already then by clicking on the register link, user redirects to the sign-up page. | Click: Register link on the login page   | User redirects to the signup form page. | User redirects to the signup form page. | Pass   |
| 3   | To check if the user fills the form, user shall be able to submit his form.                                      | Name: Muhammad Azfar<br>Email: Azfariqbal01@gmail.com<br>Password: azfar054<br>Confirm Password: azfar054<br>Click Signup button | User redirects to the login page.       | User redirects to the login page.       | Pass   |
| 4   | To check when the system accepts user submission, system shall allow Admin to login                              | Enter Login details.<br>Email:<br>Password:  | Login page displayed                    | Login page displayed                    | Pass   |
| 5   | To check if the user missed information in any field and clicks on register                                      | Email: azfariqbal01@gmail.com<br>Password:<br>Confirm Password:  | Message: "Missing Credentials"          | Message: "Missing Credentials"          | Pass   |

|   |  |                                  |   |   |      |
|---|--|----------------------------------|---|---|------|
|   | button.  |                                  |   |   |      |
| 6 | Checking the validation of email field of sign-up that if it displays an alert of wrong email format or not. | Email:<br>aknd@andkagmail.com    | “Invalid Credentials”.                    | “Invalid Credentials”.                    | Pass |
| 7 | To check if the user enters duplicated information, system prompt an error message or not.                   | Email:<br>azfariqbal01@gmail.com | Alert generated:<br>Email already exists. | Alert generated:<br>Email already exists. | Pass |
| 8 | Verify the email field of sign-up to validate that it takes @ in email                                       | Email:<br>azfariqbal1@gmail.com  | “Invalid Credentials”.                    | “Invalid Credentials”.                    | Pass |
| 9 | Check If the system redirects the user to the login page after submission or not                             | Click: Register button           | User redirects to the login page.         | User redirects to the login page.         | Pass |

**Functional Testing 6: Login as Admin**

**Objective:** To ensure that the correct page is loaded.

**Test Case Id: TC\_006**

**Table 109 Functional Test Case Id: TC\_006**

| No. | Test case/Test script    | Attribute and value                          | Expected result   | Actual result   | Result |
|-----|--------------------------|--|---|---|--------|
| 1.  | Login as an Admin member | Username: Muhammad Azfar<br>Password: abc123 | Main page for the Admin is loaded with the Admin navigation bar | Main page for the Admin is loaded with the Admin navigation bar | Pass   |

**Functional Testing 7: Logout as Admin**

**Objective:** To ensure that the Admin is logged out from their respective accounts.

**Test Case Id: TC\_007**

**Table 110 Functional Test Case Id: TC\_007**

| No. | Test case/Test script                                 | Attribute and value | Expected result      | Actual result        | Result |
|-----|---|---------------------|----------------------|----------------------|--------|
| 1.  | Admin tries to logout and is redirected to login page | Single Click        | Login Page displayed | Login Page displayed | Pass   |

**Functional Testing 8: Login as Shop Owner & Employee**

**Objective:** To ensure that the correct page is loaded.

**Test Case Id: TC\_008**

**Table 111 Functional Test Case Id: TC\_008**

| No. | Test case/Test script        | Attribute and value                  | Expected result   | Actual result   | Result |
|-----|------------------------------|--------------------------------------|---|---|--------|
| 1.  | Login as a Shop Owner member | Username: Danish<br>Password: abc123 | Main page for the Shop Owner is loaded with the Shop Owner navigation bar | Main page for the Shop Owner is loaded with the Shop Owner navigation bar | Pass   |
| 2.  | Login as an Employee member  | Username: Talha<br>Password: abc123  | Main page for the Employee is loaded with the Employee navigation bar     | Main page for the Employee is loaded with the Employee navigation bar     | Pass   |

**Functional Testing 9: Logout as Employee & Shop Owner**

**Objective:** To ensure that the Employee & Shop Owner are logged out from their respective accounts.

**Test Case Id: TC\_009**

**Table 112 Functional Test Case Id: TC\_009**

| No. | Test case/Test script                                      | Attribute and value | Expected result      | Actual result        | Result |
|-----|--|---------------------|----------------------|----------------------|--------|
| 1.  | Employee tries to logout and is redirected to login page   | Single Click        | Login Page displayed | Login Page displayed | Pass   |
| 2.  | Shop Owner tries to logout and is redirected to login page | Single Click        | Login Page displayed | Login Page displayed | Pass   |



### Functional Testing 10: Employee View Profile

**Objective:** To ensure that the User can view their respective profile information.

**Test Case Id:** TC\_010

Table 113 Functional Test Case Id: TC\_010

| No. | Test case/Test script  | Attribute and value | Expected result                                     | Actual result                                       | Result |
|-----|--|---------------------|---|---|--------|
| 1.  | Verify that the system redirects user to employee detail page when user clicks on my profile option. | Single Click        | Successfully redirects to the Employee profile page | Successfully redirects to the Employee profile page | Pass   |

### Functional Testing 11: Shop Owner View Profile

**Objective:** To ensure that the User can view their respective profile information.

**Test Case Id:** TC\_011

Table 114 Functional Test Case Id: TC\_011

| No. | Test case/Test script  | Attribute and value | Expected result                                       | Actual result   | Result |
|-----|--|---------------------|---|---|--------|
| 1.  | Verify that the system redirects user to Shop Owner detail page when user clicks on my profile option. | Single Click        | Successfully redirects to the Shop Owner profile page | Successfully redirects to the Shop Owner profile page | Pass   |

### Functional Testing 12: View Registered Users

**Objective:** To ensure that all the registered users are displayed with correct usernames.

**Test Case Id:** TC\_012

Table 115 Functional Test Case Id: TC\_012

| No. | Test case/Test script  | Attribute and value | Expected result  | Actual result  | Result |
|-----|--|---------------------|--|--|--------|
| 1.  | Verify that correct users are displayed with correct usernames upon clicking on view users | Single Click        | All the registered users are displayed with their correct usernames. | All the registered users are displayed with their correct usernames. | Pass   |

### Functional Testing 13: Display Attendance Chart for Employee

**Objective:** To ensure that all correct pie chart is displayed for Employee Attendance.

**Test Case Id:** TC\_013

Table 116 Functional Test Case Id: TC\_013

| No. | Test case/Test script               | Attribute and value | Expected result                                    | Actual result                                      | Result |
|-----|-------------------------------------|---------------------|--|--|--------|
| 1.  | User clicks on My Attendance Option | Single Click        | Employee Attendance displayed in form of pie chart | Employee Attendance displayed in form of pie chart | Pass   |

**Functional Testing 14:** Display Attendance Chart for Shop Owner Account

**Objective:** To ensure that all correct pie chart is displayed for Employee Attendance.

**Test Case Id:** TC\_014

Table 117 Functional Test Case Id: TC\_014

| No. | Test case/Test script                          | Attribute and value | Expected result               | Actual result                 | Result |
|-----|--|---------------------|-------------------------------|-------------------------------|--------|
| 1.  | User clicks on Employee Attendance Option      | Single Click        | List of Employees displayed   | List of Employees displayed   | Pass   |
| 2.  | User clicks on desired employee name from list | Single Click        | Employee attendance displayed | Employee Attendance displayed | Pass   |

**Functional Testing 15:** Mark attendance of multiple employees.

**Objective:** To ensure that all attendance is marked for the correct employee.

**Test Case Id:** TC\_015

Table 118 Functional Test Case Id: TC\_015

| No. | Test case/Test script                       | Attribute and value           | Expected result                              | Actual result                                | Result |
|-----|---|-------------------------------|--|--|--------|
| 1.  | User starts employee attendance application | Single Click                  | Application started and webcam is opened     | Application started and webcam is opened     | Pass   |
| 2.  | User stays visible in camera                | Human/Person (Muhammad Azfar) | Attendance Marked present for Muhammad Azfar | Attendance Marked present for Muhammad Azfar | Pass   |
| 3.  | Another user appears in front of camera     | Human/Person (Umair)          | Attendance Marked present for Umair          | Attendance Marked present for Umair          | Pass   |

## 7.3 Business Rules Testing

**Business Rules Testing 1:** Choose Email for account registration

**Testing Objective:** To ensure that correct email chosen is valid.

**Conditions:**

- Email should follow the given pattern
- No two users can have the same email

**Test Case Id:** TC\_001

Table 119 Business Rules Test Case Id: TC\_001

| Conditions                    | Rule 1 | Rule 2 | Rule 3 | Rule 4 |
|-------------------------------|--------|--------|--------|--------|
| Email to follow pattern       | Y      | Y      | N      | N      |
| No two users have same emails | Y      | N      | Y      | N      |
| <b>Actions/Outcomes</b>       |        |        |        |        |
| Email is selected             | Y      | N      | N      | N      |

**Business Rules Testing 2:** Choose Password for account registration

**Testing Objective:** To ensure that Password chosen is valid.

**Conditions:**

- Password should be alphanumeric
- Password should be minimum 8 characters long

**Test Case Id:** TC\_002

Table 120 Business Rules Test Case Id: TC\_002

| Conditions                | Rule 1 | Rule 2 | Rule 3 | Rule 4 |
|---------------------------|--------|--------|--------|--------|
| Password Alphanumeric     | Y      | Y      | N      | N      |
| Minimum 8 Characters Long | Y      | N      | Y      | N      |
| <b>Actions/Outcomes</b>   |        |        |        |        |
| Password is selected      | Y      | N      | N      | N      |

### Business Rules Testing 3: Log into the account

**Testing Objective:** To ensure that login is performed accordingly under certain conditions.

**Conditions:**

- Password should be valid
- Email should be valid
- Credentials should belong to an existing user

**Test Case Id: TC\_003**

Table 121 Business Rules Test Case Id: TC\_003

| Conditions                             | Rule 1 | Rule 2 | Rule 3 | Rule 4 | Rule 5 | Rule 6 | Rule 7 | Rule 8 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|
| Alphanumeric Password                  | Y      | Y      | Y      | Y      | N      | N      | N      | N      |
| Email is valid                         | Y      | N      | Y      | N      | Y      | Y      | N      | N      |
| Credentials belong to an existing user | Y      | N      | N      | Y      | Y      | N      | Y      | N      |
| <b>Actions/Outcomes</b>                |        |        |        |        |        |        |        |        |
| Login and Use Application              | Y      | N      | N      | N      | N      | N      | N      | N      |

## 7.4 Integration Testing

### Integration Testing 1: Verification of Sign-up

**Testing Objective:** To ensure that correct email is sent message for verification upon sign-up.

**Test Case Id:** TC\_001

Table 122 Integration Test Case Id: TC\_001

| No. | Test case/Test script | Attribute value and        | Expected result                         | Actual result                           | Result |
|-----|-----------------------|----------------------------|---|---|--------|
| 1.  | Signup                | Name<br>Email<br>Password  | Verification Email is sent to the user. | Verification Email is sent to the user. | Pass   |
| 2.  | Email Verification    | Click on verification link | User verified                           | User Verified                           | Pass   |

### Integration Testing 2: Edit User Information

**Testing Objective:** To ensure the interface of Employee/Shop Owner for updating user information is working correctly.

**Test Case Id:** TC\_002

Table 123 Integration Test Case Id: TC\_002

| No. | Test case/Test script                | Attribute value and                       | Expected result   | Actual result   | Result |
|-----|--------------------------------------|---|---|---|--------|
| 1.  | Fill Information                     | Name<br>Email<br>User Type<br>Password    | All required fields in the form are filled correctly.           | Fields filled correctly   | Pass   |
| 2.  | Submit Information                   | Name<br>Email<br>User Type<br>Password    | User information updated successfully                           | User information updated successfully                           | Pass   |
| 3   | Change information in user interface | User (Employee/Shop Owner)<br>Information | User Interface updated successfully and shown in user interface | User Interface updated successfully and shown in user interface | Pass   |

### Integration Testing 3: Verify OTP

**Testing Objective:** To ensure that correct email is sent message for verification upon signup.

**Test Case Id:** TC\_003

Table 124 Integration Test Case Id: TC\_003

| No. | Test case/Test script              | Attribute and value                  | Expected result   | Actual result   | Result |
|-----|------------------------------------|--------------------------------------|---|---|--------|
| 1.  | The user clicks on forgot password | Single Click                         | The system directs the user to forgot password page         | The system directs the user to forgot password page         | Pass   |
| 2.  | The user writes his email          | Email: muhammadazfariqbal1@gmail.com | System updates email field                                  | System updates email field                                  | Pass   |
| 3.  | User writes OTP                    | OTP: 123456                          | The system validates the OTP and navigates user to homepage | The system validates the OTP and navigates user to homepage | Pass   |

### Integration Testing 4: Weapon Detection

**Testing Objective:** To ensure that System detects pistol.

**Test Case Id:** TC\_004

Table 125 Integration Test Case Id: TC\_004

| No. | Test case/Test script                      | Attribute and value | Expected result   | Actual result   | Result |
|-----|--|---------------------|---|---|--------|
| 1.  | The user clicks on Weapon Detection Button | Single Click        | The system prompts the user a web footage through webcam                      | The system prompts the user a web footage through webcam                      | Pass   |
| 2.  | The user places pistol towards the camera  | Pistol              | The system detects the object and marks a box around it with the pistol label | The system detects the object and marks a box around it with the pistol label | Pass   |

### Integration Testing 5: Trespasser Detection

**Testing Objective:** To ensure that System detects trespasser.

**Test Case Id:** TC\_005

Table 126 Integration Test Case Id: TC\_005

| No . | Test case/Test script                           | Attribute and value | Expected result  | Actual result  | Result |
|------|---|---------------------|--|--|--------|
| 1.   | The user clicks on Trespassing Detection Button | Single Click        | The system prompts the user a web footage through webcam                                   | The system prompts the user a web footage through webcam                                   | Pass   |
| 2.   | The user places selects ROI                     | Select Region       | System updates email field   | System updates email field   | Pass   |
| 3.   | The User stays visible by the camera            | Trespasser/Person   | The system detects the human as a person and marks a box around them with the person label | The system detects the human as a person and marks a box around them with the person label | Pass   |

### Integration Testing 6: View User Account

**Testing Objective:** To ensure the interface of Admin viewing list of users works well.

**Test Case Id:** TC\_006

Table 127 Integration Test Case Id: TC\_006

| No. | Test case/Test script | Attribute and value | Expected result  | Actual result  | Result |
|-----|-----------------------|---------------------|--|--|--------|
| 1.  | Registered Users list | User Information    | Display registered Users (Employee & Shop Owner) list to the Admin | Display registered Users (Employee & Shop Owner) list to the Admin | Pass   |



## Integration Testing 7: Edit User Account

**Testing Objective:** To ensure the interface of Admin for updating user information is working correctly.

**Test Case Id:** TC\_007

Table 128 Integration Test Case Id: TC\_007

| No. | Test case/Test script | Attribute and value       | Expected result                                       | Actual result                          | Result |
|-----|-----------------------|---------------------------|---|--|--------|
| 1.  | Fill Information      | Personal Information      | All required fields in the form are filled correctly. | Fields filled correctly                | Pass   |
| 2.  | Submit Information    | Name<br>Email<br>Password | Admin information updated successfully                | Admin information updated successfully | Pass   |

## Integration Testing 8: Admin Forgot Password

**Testing Objective:** To ensure the Admin forgot password functionality works properly.

**Test Case Id:** TC\_008

Table 129 Integration Test Case Id: TC\_008

| No. | Test case/Test script                  | Attribute and value             | Expected result   | Actual result   | Result |
|-----|--|---------------------------------|---|---|--------|
| 1.  | Admin Clicks on forgot password        | Single Click                    | System redirect Admin to screen for entering username/email | System redirect Admin to screen for entering username/email | Pass   |
| 2.  | Admin enters his/her username/email    | Username: azfariqbal1@gmail.com | An email is sent to the user of the entered email           | An email is sent to the user of the entered email           | Pass   |
| 3.  | Admin clicks on change password button | Single Click                    | System prompts the user to enter password                   | System prompts the user to enter password                   | Pass   |
| 4.  | Admin enters new password              | Password: abc123                | Password entered successfully                               | Password entered successfully                               | Pass   |
| 5.  | Admin clicks submit button             | Single Click                    | System displays password updated successfully               | System displays password updated successfully               | Pass   |

## Integration Testing 9: Delete User Account

**Testing Objective:** To ensure the interface of Admin for deleting user information is working correctly.

**Test Case Id:** TC\_009

Table 130 Integration Test Case Id: TC\_009

| No. | Test case/Test script                 | Attribute and value | Expected result   | Actual result   | Result |
|-----|---------------------------------------|---------------------|---|---|--------|
| 1.  | Click on delete icon for desired user | Single Click        | All required fields in the form are filled correctly.             | Fields filled correctly   | Pass   |
| 2.  | Click on delete icon for desired user | Single Click        | User information deleted successfully & updated in user interface | User information deleted successfully & updated in user interface | Pass   |

**Integration Testing 10:** Email Alert for Weapon Detection.**Testing Objective:** To ensure that Weapon detection email is sent successfully.**Test Case Id:** TC\_010**Table 131 Integration Test Case Id: TC\_010**

| No. | Test case/Test script                           | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application               | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User clicks on weapon detection             | Single Click   | The system starts to record the video capture   | The system starts to record the video capture   | Pass   |
| 3   | The User places a pistol in front of the screen | Pistol   | The system detects the object as a pistol and marks a box around it. System sends email to the Shop Owner | The system detects the object as a pistol and marks a box around it. System sends email to the Shop Owner | Pass   |
| 4   | The User opens the sent email                   | Single Click   | The system displays weapon detection email sent to the Shop Owner along with picture of intruder.         | The system displays weapon detection email sent to the Shop Owner along with picture of intruder.         | Pass   |

### Integration Testing 11: Email Alert for Trespassing Detection.

**Testing Objective:** To ensure that Trespassing detection email is sent successfully.

**Test Case Id:** TC\_011

Table 132 Integration Test Case Id: TC\_011

| No. | Test case/Test script                     | Attribute and value  | Expected result  | Actual Result  | Result |
|-----|---|--|--|--|--------|
| 1   | The User launches the application         | Username: <a href="mailto:azfariqball@gmail.com">azfariqball@gmail.com</a><br>Password: abc123 | System displays Video Capture  | System displays Video Capture  | Pass   |
| 2   | The User clicks on trespassing detection  | Single Click   | The system starts to record the video capture  | The system starts to record the video capture  | Pass   |
| 3   | The User selects Region of Interest (ROI) | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that region                                     | System recognizes ROI and proceeds to detect trespasser in that region                                     | Pass   |
| 4   | The User stays visible by the camera      | Detect Trespasser  | The system detects the human as a person and marks a box around them. System sends email to the Shop Owner | The system detects the human as a person and marks a box around them. System sends email to the Shop Owner | Pass   |
| 5   | The Shop Owner opens the sent email       | Single Click   | The system displays trespassing detection email sent to the Shop Owner along with picture of intruder.     | The system displays trespassing detection email sent to the user along with picture of intruder.           | Pass   |

**Integration Testing 12:** Record, Save, and Upload Video on Cloudinary Server for Weapon Detection.

**Testing Objective:** To ensure that video is recorded, saved, and uploaded on Cloudinary server.

**Test Case Id:** TC\_012

**Table 133 Integration Test Case Id: TC\_012**

| No. | Test case/Test script                           | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application               | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User clicks on weapon detection             | Single Click   | The system starts to record the video capture   | The system starts to record the video capture   | Pass   |
| 3   | The User places a pistol in front of the screen | Pistol   | The system detects the object as a pistol and marks a box around it   | The system detects the object as a pistol and marks a box around it   | Pass   |
| 4   | The User closes the application                 | Single Click   | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloudinary | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloudinary | Pass   |

**Integration Testing 13:** Record, Save, and Upload Video on Cloudinary Server for Trespassing Detection.

**Testing Objective:** To ensure that video is recorded, saved, and uploaded on Cloudinary server.

**Test Case Id:** TC\_013

**Table 134 Integration Test Case Id: TC\_013**

| No. | Test case/Test script                     | Attribute and value  | Expected result   | Actual Result   | Result |
|-----|---|--|---|---|--------|
| 1   | The User launches the application         | Username: <a href="mailto:azfariqbal1@gmail.com">azfariqbal1@gmail.com</a><br>Password: abc123 | System displays Video Capture   | System displays Video Capture   | Pass   |
| 2   | The User clicks on trespassing detection  | Single Click   | The system starts to record the video capture   | The system starts to record the video capture   | Pass   |
| 3   | The User selects Region of Interest (ROI) | Selected Region  | System recognizes ROI and proceeds to detect trespasser in that region  | System recognizes ROI and proceeds to detect trespasser in that region  | Pass   |
| 4   | The User stays visible by the camera      | Detect Trespasser  | The system detects the human as a person and marks a box around them  | The system detects the human as a person and marks a box around them  | Pass   |
| 5   | The User closes the application           | Single Click   | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloudinary | The system saved the recorded video inside the directory chosen by the user and uploads the same recorded video to cloudinary | Pass   |