|  |
| --- |
| **K. K. Wagh Polytechnic, Nashik.**  HirabaiHaridasVidyanagari, Amrutdham, Panchavati, Nashik-422003  **Department of Computer Technology** |



**Academic Year: 2023-24**

**Class: TYCM-Win Group No: 26 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Title of Project: Attendance Monitoring System Using Facial Recognition**

**Assignment No: 3**

**Name of Activity (Assignment): Testing of Project**

**Name: Mrs.Y.U.Kadam**

**Signature of Guide:**

**1) Test Cases of User Login Module:** The test cases for the User Login Module focus on verifying the functionality and security of the login process. They include scenarios to validate the correct handling of valid and invalid credentials, authentication mechanisms, session management, and password encryption.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Steps** | **Expected Result** | **Pass/Fail Criteria** |
| TC\_001 | Successful Login | 1. Launch application and navigate to login page.  2. Verify Username and Password fields and Login button are present.  3. Enter a valid registered username and password.  4. Click Login button. | User successfully logged in and redirected to the intended application area. | User logs in and accesses the application. |
| TC\_002 | Invalid Username | 1. Follow steps 1 & 2 from TC\_001.  2. Enter an invalid username that does not exist.  3. Enter a valid password.  4. Click Login button. | Error message displayed indicating invalid username. | Error message for invalid username shown. |
| TC\_003 | Invalid Password | 1. Follow steps 1 & 2 from TC\_001.  2. Enter a valid username. 3. Enter an incorrect password.  4. Click Login button. | Error message displayed indicating invalid password. | Error message for invalid password shown. |
| TC\_004 | Blank Username and Password | 1. Follow steps 1 & 2 from TC\_001.  2. Leave both Username and Password fields blank.  3. Click Login button. | Error message displayed indicating missing username and/or password. | Error message for missing credentials shown. |
| TC\_005 | Blank Username | 1. Follow steps 1 & 2 from TC\_001.  2. Leave Username field blank.  3. Enter a valid password.  4. Click Login button. | Error message displayed indicating missing username. | Error message for missing username shown. |

**2) Test Cases of Home Page module:** The test cases for the User Login Module focus on verifying the functionality and security of the login process. They include scenarios to validate the correct handling of valid and invalid credentials, authentication mechanisms, session management, and password encryption.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Steps** | **Expected Result** | **Pass/Fail Criteria** |
| TC\_001 | Access Student Details | 1. Successfully log in.  2. Navigate to the “Student Details” sub-module  3. Verify that student list or details can be viewed. | Student details are correctly displayed and accessible. | Correct display and access to student details. |
| TC\_002 | Add New Student | 1. Navigate to the “Student Details” sub-module.  2. Click on “Add New Student” button.  3. Enter the details of the new student and save. | New student details are saved and displayed in the student list. | Successful addition of a new student. |
| TC\_003 | Edit Student Details | 1. Navigate to a student’s details.  2. Click on “Edit” button.  3. Modify the details and save changes. | The changes are saved and reflected in the student's details. | Successful modification of student details. |
| TC\_004 | Record Attendance through Face Detection | 1. Use the “Detect Faces” function with known student faces.  2. Verify that the attendance is marked for the detected faces. | Attendance for the detected student faces is correctly marked and recorded. | Correct marking and recording of attendance. |
| TC\_005 | Upload and Manage Photos | 1. Navigate to the “Photos” sub-module.  2. Upload new photos.  3. Verify that uploaded photos are correctly categorized and accessible. | Photos are uploaded successfully and are correctly categorized under respective student profiles or identification tags. | Successful photo upload and categorization. |

**3) Test Cases of Student Details Management:** These test cases ensure comprehensive coverage of the Student Details Management module, focusing on functionality, data integrity, user interaction, and error handling to maintain a robust and user-friendly system.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Steps** | **Expected Result** | **Pass/Fail Criteria** |
| TC\_001 | Successful Data Retrieval | 1. Log in as an administrator.  2. Navigate to the Student Details Management section.  3. Select a department and course.  4. Click on the 'Retrieve' button. | Correct student details corresponding to the selected department and course are displayed. | Correct data is displayed. |
| TC\_002 | Add New Student Record | 1. Log in as an administrator.  2. Navigate to the Student Details Management section.  3. Click on 'Add New Student'.  4. Enter all required student details. 5. Click 'Save'. | New student record is successfully added and confirmation message is displayed. | New student data added and confirmation received. |
| TC\_003 | Update Existing Student Record | 1. Log in as an administrator.  2. Navigate to the Student Details Management section.  3. Select an existing student record.  4. Update the necessary fields.  5. Click 'Update'. | The selected student record is updated with new details and a confirmation message is displayed. | Student record updated and confirmation received. |
| TC\_004 | Delete Student Record | 1. Log in as an administrator.  2. Navigate to the Student Details Management section.  3. Select an existing student record.  4. Click 'Delete'.  5. Confirm deletion. | The selected student record is deleted and a confirmation message is displayed. | Student record deleted and confirmation received. |
| TC\_005 | Invalid Data Entry in Fields | 1. Log in as an administrator.  2. Navigate to 'Add New Student' or 'Update' form.  3. Enter invalid data in one or more fields.  4. Click 'Save' or 'Update'. | Error message(s) displayed indicating invalid data in the specified fields. | Error message(s) for invalid data shown. |

**4) Test Cases of Detect Faces Module:** These test cases aim to ensure that the face detection module works accurately under various conditions and can handle errors gracefully.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Steps** | **Expected Result** | **Pass/Fail Criteria** |
| TC\_001 | Successful Face Detection | 1. Launch the application and navigate to the face detection feature.  2. Allow access to the camera. 3. Present a registered user's face to the camera. | The system successfully detects and recognizes the face, matching it with the stored features in classifier.xml. | Face is detected and correctly identified. |
| TC\_002 | Face Not Registered | 1. Launch the application and navigate to the face detection feature.  2. Allow access to the camera.  3. Present an unregistered user's face to the camera. | Error message or indication that the face is not recognized or registered. | Error message or non-recognition indication shown. |
| TC\_003 | No Face Presented | 1. Launch the application and navigate to the face detection feature.  2. Allow access to the camera.  3. Do not present any face to the camera. | Error message or indication that no face is detected. | Error message for no face detection shown. |
| TC\_004 | Multiple Faces | 1. Launch the application and navigate to the face detection feature.  2. Allow access to the camera.  3. Present multiple faces to the camera at once | The system either recognizes all faces presented or displays an error if unable to process multiple faces. | All faces detected and identified, or appropriate error shown. |
| TC\_005 | Face Detection under Poor Lighting | 1. Launch the application and navigate to the face detection feature.  2. Allow access to the camera.  3. Present a registered user's face under poor lighting. | System struggles with face detection, potentially showing an error message or taking longer to recognize. | System behavior under poor lighting conditions noted |

**5) Test Cases of** **Training Dataset:** These test cases are designed to cover various scenarios that could affect the reliability and accuracy of the facial recognition system's training phase. Ensuring that the system can handle these cases effectively is crucial for its overall performance and usability in real-world applications.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Steps** | **Expected Result** | **Pass/Fail Criteria** |
| TC\_001 | Successful Feature Extraction | 1. Navigate to the feature extraction module.  2. Upload a valid photo sample.  3. Initiate the feature extraction process. | Features are successfully extracted from the photo sample and stored in **classifier.xml**. | Features correctly extracted and stored. |
| TC\_002 | Invalid Photo Format | 1. Navigate to the feature extraction module.  2. Upload a photo in an unsupported format.  3. Attempt to initiate the feature extraction process. | Error message displayed indicating unsupported photo format. | Error message for unsupported format shown. |
| TC\_003 | Corrupted Photo Sample | 1. Navigate to the feature extraction module.  2. Upload a corrupted photo file.  3. Attempt to initiate the feature extraction process. | Error message displayed indicating the photo cannot be processed. | Error message for corrupted photo shown. |
| TC\_004 | Missing Photo Sample | 1. Navigate to the feature extraction module.  2. Attempt to initiate the feature extraction process without uploading a photo. | Error message displayed indicating no photo sample was uploaded. | Error message for missing photo shown. |
| TC\_005 | Classifier File Update With New Data | 1. Navigate to the feature extraction module.  2. Upload a valid new photo sample.  3. Initiate the feature extraction process.  4. Check the classifier.xml file. | New features are added to **classifier.xml** without overwriting existing data. | Classifier file correctly updated. |

**6 Test Cases of** **Attendance:** These test cases focus on the critical aspects of the Attendance module, ensuring not only that the face recognition and attendance marking features function correctly but also that the system handles errors and edge cases appropriately.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Steps** | **Expected Result** | **Pass/Fail Criteria** |
| TC\_001 | Successful Attendance Marking | 1. Initiate attendance process.  2. Present a registered student's face in front of the camera.  3. Validate face recognition and data retrieval  4. Mark "In Timing". | Attendance marked with accurate "In Timing" for the recognized student. | Correct attendance record entry. |
| TC\_002 | Unregistered Student | 1. Initiate attendance process. 2. Present an unregistered student's face in front of the camera.  3. Attempt to validate face recognition. | Error message or indication that the face is not recognized/registered. | Appropriate handling of unregistered faces. |
| TC\_003 | Marking Out Timing | 1. Ensure a student's attendance has been marked "In".  2. Present the same student's face at end of the day.  3. Mark "Out Timing". | "Out Timing" accurately marked and recorded in the system. | Correct "Out Timing" record entry. |
| TC\_004 | Incorrect Face Recognition | 1. Initiate attendance process. 2. Present a slightly obscured or angled face of a registered student.  3. Attempt face recognition. | System prompts for clearer or direct face positioning or fails to recognize the face. | System accurately handles recognition errors. |
| TC\_005 | System Error during Data Retrieval | 1. Initiate attendance process. 2. Present a registered student's face.  3. Simulate a database retrieval error. | System displays an error message indicating an issue with data retrieval. | Error is clearly communicated. |