

Test

1st Test Run  
pass % : 77%(14/18)  
NT % : 10% (2/20)

2nd Test Run  
pass % : 100%(18/18)  
NT % : 10% (2/20)

RS #	component	Requirement Specification	verification	TC #	Test Case	Test Reusult	Test Reusult
RS2	client	The client application must provide a login function for user authentication and use ID, password, and OTP for user authentication.	Test Case	TC1	<div>description) registered user login</div> <div>steps) 1) open a browser and connect to "https://localhost:3000" 2) click the 'sign in' button on the browser. 3) enter the registered ID, password and OTP</div> <div>expected result) "illegal license plate" and "license plate history" location are displayed on the browser</div>	Fail	Pass
			Test Case	TC2	<div>description) unregistered user login</div> <div>steps) 1) open a browser and connect to "https://localhost:3000" 2) click the 'sign in' button on the browser. 3) enter the <b>unregistered</b> ID or password or OTP</div> <div>expected result) "inavlid username" popup is displayed.</div>	Pass	Pass
			Test Case	TC3	<div>description) login with invalid ID</div> <div>steps) 1) open a browser and connect to "https://localhost:3000" 2) click the 'sign in' button on the browser. 3) enter the <b>invalid ID</b> - <a href="#">abcdefg.com</a> - 1@2.3 - A(75 characters)@a.org</div> <div>expected result) "Must be a valid email" message is displayed. "email must be at most 80 characters"</div>	Pass	Pass
			Test Case	TC4	<div>description) login with invalid password</div> <div>steps) 1) open a browser and connect to "https://localhost:3000" 2) click the login button on the browser. 3) endter the <b>invalid password</b> - 1 - 1(21 characters)</div> <div>expected result) 'Invalid Password or OTP Number' popup is displayed.</div>	Fail	Pass
RS3	client	After logging in to the client application, the user can view the ilegal license plate screen and the license plate history screen.	Test Case	TC1			
RS4	client	User credentials are not stored in the client.	Code Review				

RS5	client	user credentials are ID, password and OTP. If the password or OTP input fails three times together, it is determined to be lost or leaked and the password and OTP of the ID must be reissued.	Test Case	TC5	description) ID fail over 3 times  steps) 1) open a browser and connect to "https://localhost:3000" 2) click the login button on the browser. 3) enter the <b>unregistered ID 5 times</b>  expected result) login popup is displayed.	Pass	Pass
				TC6	description) password fail over 3 times  steps) 1) open a browser and connect to "https://localhost:3000" 2) click the login button on the browser. 3) enter the wrong <b>password 3 times</b>  expected result) "invalid password" popup is displayed. A new password has been sent to you by backup e-mail(test@gmail.com)	Pass	Pass
RS6	client	In the client application, the user can select the SAVE function. If SAVE is selected, it is saved as a file in the local repository.	Test Case	TC7	description) save the retrieved information into local repository  precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server  steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) click the "Save" in the "SAVE FILE" 3) click the "START VIEW" 4) waiting for 30 seconds 5) click the "STOP VIEW"  expected result) 1) recognized video is saved in the local repository	Pass	Pass
RS11	client	The client application communicates with the ALPR server via HTTPS.	Test Case	TC8	description) secured communication channel between client and server  precondition) 1) execute the wireshart program 2) open a browser and connect to "https://localhost:3000" 3) login the server  steps) 1) check the logs on the wireshark  expected result) packet communication through HTTPS	Pass	Pass

RS12	client	The client application must read the image through the vehicle camera or playback file to identify the license plate.	Test Case	TC9	description) vehicle license plate recognition using video  precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server  steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) click the "START VIEW"  expected result) 1) Vehicle license plate recognition begins. 2) selected video file is displayed in the "View"	Pass	Pass
				TC10	description) vehicle license plate recognition using image  precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server  steps) 1) click the "Image" in the "SELECT INPUT FILE TYPE" 2) click the "START VIEW"  expected result) 1) Vehicle license plate recognition begins. 2) selected image file is displayed in the "View"	Pass	Pass
RS13	client	In terms of web interface performance, the client is stable in recognition of a video file of about 10 fps frame rate.  The client application converts the input video to about 10 fps and executes it.	Test Case	TC11	description) Convert the frame rate of the video to about 10 fps.  precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server  steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) select the "Frame info. on" 2) select a video file greater than or equal to 15 fps. 2) click the "START VIEW"  expected result) 1) The fps shown on the video screen is about 10 fps.	Pass	Pass
RS14	client	The client application requests details of the vehicle from the server. The client application alerts the user if the vehicle details contain the following: 1) stolen 2) the owner is wanted (criminal) 3) expired registration 4) unpaid ticket 5) owner is missing The alert information shall include the following : 1) recognized license plate number 2) alert reason 3) vehicle make 4) model 5) color	Test Case	TC12	description) alert display  precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server  steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) select a video file. 3) click the "START VIEW"  expected result) 1) alert information is displayed in the "Illegal License Plate" 2) detailed alert information is displayed in the "License Plate History"	Pass	Pass

RS15	client	<p>If the client application is not an alert, the contents below should be shown in the UI.</p> <ol style="list-style-type: none"> <li>1) the last recognized plate image</li> <li>2) recognized license plate number</li> <li>3) vehicle make</li> <li>4) model</li> <li>5) color</li> </ol>	Test Case	TC13	<p>description) the last recognized view display</p> <p>precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server</p> <p>steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) select a video file. 3) click the "START VIEW"</p> <p>expected result) 1) the last recognized image is displayed in the "License Plate View (Latest)" 2) detailed information is displayed in the "License Plate History"</p>	Pass	Pass
RS16	client	The client application must have an area in the UI that shows the current camera image or video screen.	Test Case	TC9, TC10			
RS18	client	The client application allows the user to choose whether to use live camera or video file in the UI.	Test Case	TC9, TC10			
RS19	client	The client application detects the network connectivity issue with the server within 5 seconds.	Test Case	TC15	<p>description) connection fail between server and client</p> <p>precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server</p> <p>steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) select a video file. 3) click the "START VIEW" 4) turn off wifi</p> <p>expected result) 1) connection fail icon is displayed within 5 seconds.</p>	Fail	Pass
RS20	client	The client application notifies the user as soon as it detects the occurrence of a communication error/failure with the server.	Test Case				
RS21	client	The client application checks the communication status with the server using the API provided by the server.	Test Case				
RS22	client	After the client application sends a query to the server, the information shall be received within 10 seconds.	Test Case	TC16	<p>description) server not responding</p> <p>precondition) 1) open a browser and connect to "https://localhost:3000" 2) login the server</p> <p>steps) 1) click the "video" in the "SELECT INPUT FILE TYPE" 2) select a video file. 3) click the "START VIEW" 4) shut down server</p> <p>expected result) 1) server error Status Msg is displayed within 10 seconds.</p>	Fail	Pass
RS23	server	<p>- The server support license plate queries.</p> <p>- best or partial plate number</p>	Test Case	TC17	<p>&lt;Steps&gt; 1. Request GET method with a plate number to the server</p> <p>&lt;Expected Result&gt; - Return of Information that matches a queried plate number</p>	NT	NT

RS24	server	- The server should support secure communicates with a client application. - e.g. HTTPS	Test Case	TC8			
RS25	server	- The server support authentication of a remote laptop user. 1) ID/password 2) OTP number  - If a user input wrong password or OTP 3 times, a new password should be sent to the user by email registered.	Test Case	TC18	<Steps> 1. Request POST method to the server with wrong password or OTP 3 times  <Expected Result> - Send email to the user with a new password	NT	NT
RS26	server	- The server allows multiple users unlimitedly.	Server Setting	N/A	N/A		
RS27	server	- best match : whole string from client matched. - partial match : a part of string from client matched. - The input from client should be validated against untrusted request		TC23	<Steps> 1. Transmit the input value that the first or last letter (or number) is omitted from the complete plate number to the server. 2. Transmit the input value that more than 2 letters (or numbers) at the first or last position are omitted from the complete plate number to the server.  <Expected Result> - In only case 1, the server should return proper query result.	Pass	Pass
RS28	server	- The query statistics should be written in the text file, allowing only admin to read on the admin page. - No encryption required.		TC24	<Steps> 1. Request GET method repeatedly with a plate number to the server 2. Check the text file and the admin page.  <Expected Result> 1.1. Query statistics information in the text file should be updated for each query. 1.2. Contents of admin page should be updated for each query 2. Only admin can read the text file.	Pass	Pass
RS29	server	- The match result statistics should be written in the text file, allowing only admin to read on the admin page. - No encryption required.		TC25	<Steps> 1. Request GET method repeatedly with a plate number to the server 2. Check the text file and the admin page.  <Expected Result> 1.1. Query statistics information in the text file should be updated for each query. 1.2. Contents of admin page should be updated for each query 2. Only admin can read the text file.	Pass	Pass
RS30	server	- The followings should be configurable using a configuration file.  1. matched string position for partial match 2. Session management key 3. key for creating a user authentication token 4. DB encryption key 5. SMTP key for mail transfer. 6. The email information of the admin 7. Location of DB	Code Review	-	-		
RS35	server	server authentication is commonly performed by submitting a username or ID and OTP of private information that only a given user should know.	Test Case	TC1, TC2, TC3, TC4			
RS36	server	Use 128-bit AES to encrypt data in the user DB and the driver/car Information DB.	Code Review	-	- check encryption/decryption routine		
RS37	server	only allow Read permission - Ensure that least-privileged accounts are used to connect to Database server - Sysadmin role should only have valid necessary users	Code Review	-	- check absence of routine that writes into DB. - check owner of DB in the file system		
RS38	server	Immediate recovery Deploy server as a container (fault tolerance)	Server Setting	N/A	N/A		

RS39	server & client	Ensure that auditing and logging is enforced on the application The client application records and saves requests sent to the server in a file.	Test Case	TC24, TC25			
RS40	server & client	Perform input validation and filtering on all string type Model properties All the input parameters must be validated before they are used in the application to ensure that the application is safeguarded against malicious user inputs. Validate the input values using regular expression validations on server side with a allowed list validation strategy. Unsanitized user inputs / parameters passed to the methods can cause code injection vulnerabilities.	Code Review	-	- check if regular expression being used for input validation		
RS41	server & client	Enable HTTPS - Secure Transport channel The application configuration should ensure that HTTPS is used for all access to sensitive information.	Test Case	TC8			
RS42	server & client	Apply authentication token	Code Review		- check token information after login (e.g. print log in the client side)		
RS43	client	client application support Proper Password Strength Controls. - Password limit: 8 to 20 characters - Password string limit: Must contain at least one lowercase letter, uppercase letter, and number - Password special characters: ~!@\$%^&*(),<.>/?]+	Test Case	TC4			
RS44	server	Change the token generation key periodically.	Code Review				