# Functional requirements:

# User:

# Service contracts:

1. Authenticate user
2. Login
3. Register
4. View user profile
5. Update user information
6. delete user information
7. Manage user information
   1. Delete user
   2. Add user
   3. Grant admin rights

# Case 1: Authenticate user

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Status | String | “guest”  “admin”  “user” | Satisfies value specification | Does not satisfy value specification | Empty string,  Null |

## Test case generation/use case based test:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test case | Username | Valid | Expected result | Actual result |
| 1 | “guest” | Valid | Proceed to requested page as guest | Proceed to requested page as guest |
| 2 | “admin” | Valid | Proceed to requested page as admin | Proceed to requested page as admin |
| 3 | “user” | Valid | Proceed to requested page as user | Proceed to requested page as user |
| 4 | “” | Invalid | Show error message | Proceed to requested page as guest |
| 5 | ”randomString” | Invalid | Show error message | Proceed to requested page as guest |

# Case 2: Login

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Username | String | Non-empty string  With length of 9.  A registered username. | Satisfies value specification | Does not satisfy value specification or is not a registered username | Usernames with special characters or spaces |
| Password | String | Non-empty string. Match password for given username. | Satisfies value specification | Does not satisfy value specification or is does not match password for username | Empty string, invalid characters. |

## Test case generation/Use case based test:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test case | Username | Valid username | Password | Valid password | Expected result | Actual result |
| 1 | “u15099999” | Valid | “123” | Valid | Proceed to requested page | Proceed to home page |
| 2 | “u15099999” | Valid | “invalid password” | Invalid | Show error message | Show error message |
| 3 | “u15099999” | Valid | “” | Invalid | Show error message | Highlights empty input field |
| 4 | “” | Invalid | “123” | Valid | Show error message | Highlights empty input field |
| 5 | “” | Invalid | “” | Valid | Show error message | Highlights empty input field |
| 6 | “x15099999” (not registered) | Invalid | “123” | Invalid | Show error message | Show error message |
| 7 | “u150999999000000” | Invalid | “123” | Invalid | Show error message | Show error message |

# Case 3: Register

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| First name | String | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |
| Surname | String | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |
| Student Number / EMPLID | String | Non-empty string  With length of 9.  A non-registered username. | Satisfies value specification | Does not satisfy value specification or is a registered username | Usernames with special characters or spaces |
| Email | String | Non-empty string. Contains “@” and a valid domain. | Satisfies value specification | Does not contain “@” or a valid domain | Invalid special characters. |
| Phone number | String | Valid RSA phone number of length 10 numerical digits. | Registered RSA number of length 10 | Does not satisfy value specification | Non RSA phone numbers. |
| Password | String | Non-empty string. | Satisfies value specification | Does not satisfy value specification or is does not match password for username | Empty string, invalid characters. |
| Confirm password | String | Non-empty string, matches ‘Password’ | Satisfies value specification and matches ‘Password’ | Does not match ‘Password’ | None |

## Test case generation:

### Test case generation:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| First name | Surname | Student Number / EMPLID | Email | Phone number | Password | Confirm password | Expected output |
| Valid | Valid | Valid | Valid | Valid | Valid | Valid | Show message for successful registration and proceeds to home page |
| Invalid | Invalid | Valid | Valid | Valid | Valid | Valid | Highlight invalid field |
| Valid | Valid | Invalid | Valid | Valid | Valid | Valid | Highlight invalid field |
| Valid | Valid | Valid | Invalid | Valid | Valid | Valid | Highlight invalid field |
| Valid | Valid | Valid | Valid | Invalid | Valid | Valid | Highlight invalid field |
| Valid | Valid | Valid | Valid | Valid | Invalid | Valid | Highlight invalid field |
| Valid | Valid | Valid | Valid | Valid | Valid | Invalid | Highlight invalid field |
| Valid | Valid | Valid | Valid | Valid | Invalid | Invalid | Highlight invalid fields |
| Valid | Valid | Invalid | Invalid | Valid | Valid | Valid | Highlight invalid fields |
| Invalid | Invalid | Invalid | Invalid | Invalid | Invalid | Invalid | Highlight invalid fields |

### Use case based tests

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test case | First name | Surname | Student Number / EMPLID | Email | Phone number | Password | Confirm password | Expected result | Actual result |
| 1 | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “0825226667” | “123” | “123” | Show message for successful registration and proceeds to home page | Show message for successful registration and proceeds to login page |
| 2 | “” | “” | “u150999999” | “Email@example.com” | “0825226667” | “123” | “123” | Highlight invalid field | Highlight invalid field |
|  | “Jannie” | “Koos” | “” | “Email@example.com” | “0825226667” | “123” | “123” | Highlight invalid field | Highlight invalid field |
|  | “Jannie” | “Koos” | “u150999999000000” | “Email@example.com” | “0825226667” | “123” | “123” | Highlight invalid field | None |
|  | “Jannie” | “Koos” | “u150999999” | “” | “0825226667” | “123” | “123” | Highlight invalid field | Highlight invalid field |
|  | “Jannie” | “Koos” | “u150999999” | “email” | “0825226667” | “123” | “123” | Highlight invalid field | Disables register button |
|  | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “” | “123” | “123” | Highlight invalid field | Highlight invalid field |
|  | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “eeeeeeeeee” | “123” | “123” | Highlight invalid field | Disables register button |
|  | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “0825226667” | “” | “” | Highlight invalid field | Highlight invalid field |
|  | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “0825226667” | “123” | “456” | Highlight invalid field | Show error message for password comparison |

# Case 4: View user profile

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Student Number / EMPLID | String | Non-empty string  With length of 9 and is a registered user. | Satisfies value specification | Does not satisfy value specification. | Usernames with special characters or spaces |

## Test case generation:

### Test case generation/ Use case based tests:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test case | Student Number / EMPLID | Valid | Expected result | Actual result |
| 1 | “u15099999” | Valid | Show user information | Show user information |
| 2 | “” | Invalid | Show error | Show error |
| 3 | “u1509999900000” | Invalid | Show error | Show error |

# Case 5: Update user information

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| First name | String | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |
| Surname | String | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |
| Student Number / EMPLID | String | Non-empty string  With length of 9 and is a registered user. | Satisfies value specification | Does not satisfy value specification. | Usernames with special characters or spaces |
| Email | String | Non-empty string. Contains “@” and a valid domain. | Satisfies value specification | Does not contain “@” or a valid domain | Invalid special characters. |
| Password | String | Non-empty string. | Satisfies value specification | Does not satisfy value specification or is does not match password for username | Empty string, invalid characters. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test case | First name | Surname | Student Number / EMPLID | Email | Phone number | Password | Expected result | | Actual result |
| 1 | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “0825226667” | “123” | Show confirmation message | | Update user information, show confirmation message and navigate to home page |
| 2 | “” | “” | “u150999999” | “Email@example.com” | “0825226667” | “123” | Highlight invalid field | | Update user information, show confirmation message and navigate to home page |
| 3 | “Jannie” | “Koos” | “” | “Email@example.com” | “0825226667” | “123” | Show error message | | Show error message |
| 4 | “Jannie” | “Koos” | “u150999999000000” | “Email@example.com” | “0825226667” | “123” | Show error message | | Show error message |
| 5 | “Jannie” | “Koos” | “u150999999” | “” | “0825226667” | “123” | Highlight invalid field | | Update user information, show confirmation message and navigate to home page |
| 6 | “Jannie” | “Koos” | “u150999999” | “email” | “0825226667” | “123” | Highlight invalid field | | Update user information, show confirmation message and navigate to home page |
| 7 | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “” | “123” | Highlight invalid field | | Update user information, show confirmation message and navigate to home page |
| 8 | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “eeeeeeeeee” | “123” | Highlight invalid field | | Update user information, show confirmation message and navigate to home page |
| 9 | “Jannie” | “Koos” | “u150999999” | “Email@example.com” | “0825226667” | “” | | Highlight invalid field | Update user information, show confirmation message and navigate to home page |

## Test case generation:

### Test case generation:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| First name | Surname | Student Number / EMPLID | Email | Password | Expected output |
| Valid | Valid | Valid | Valid | Valid | Show message for successful registration and proceeds to home page |
| Invalid | Invalid | Valid | Valid | Valid | Highlight invalid field |
| Valid | Valid | Invalid | Valid | Valid | Highlight invalid field |
| Valid | Valid | Valid | Invalid | Valid | Highlight invalid field |
| Valid | Valid | Valid | Valid | Invalid | Highlight invalid field |
| Valid | Valid | Invalid | Invalid | Valid | Highlight invalid fields |
| Invalid | Invalid | Invalid | Invalid | Invalid | Highlight invalid fields |

# Case 6: Delete user profile

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Student Number / EMPLID | String | Non-empty string  With length of 9 and is a registered user. | Satisfies value specification | Does not satisfy value specification. | Usernames with special characters or spaces |

## Test case generation:

### Test case generation/ Use case based tests:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test case | Student Number / EMPLID | Valid | Expected result | Actual result |
| 1 | “u15099999” | Valid | Delete user profile and show confirmation message | Delete user profile and show confirmation message |
| 2 | “” | Invalid | Show error | Show error |
| 3 | “u1509999900000” | Invalid | Show error | Show error |

# Case 7: Manage user information

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Status | String | “admin” | Satisfies value specification | Does not satisfy value specification. | Special characters and other status |
| Student Number / EMPLID of Admin | String | Non-empty string  With length of 9 and is a registered admin user. | Satisfies value specification | Does not satisfy value specification. | Usernames with special characters or spaces |
| Student Number / EMPLID of searched student | String | Non-empty string  With length of 9 and is a registered user. | Satisfies value specification | Does not satisfy value specification. | Usernames with special characters or spaces |

## Test case generation:

### Test case generation/ Use case based tests:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test case | Student Number / EMPLID of Admin | Valid admin number | Student Number / EMPLID of searched student | Valid student number | Status | Valid status | Expected result | Actual result |
| 1 | “u15099999” | Valid | “u15088888” | Valid | “admin” | Valid | Editing permissions granted | Editing permissions granted, but no further functionality supported |
| 2 | “” | Invalid | “u15088888” | Valid | “admin” | Valid | Show error | Editing permissions granted, but no further functionality supported |
| 3 | “!@$@$” | Invalid | “u15088888” | Valid | “admin” | Valid | Show error | Editing permissions granted, but no further functionality supported |
| 4 | “u15099999” | Invalid | “u15088888” | Invalid | “” | Valid | Show error | Editing permissions granted, but no further functionality supported |
| 5 | “u15099999” | Valid | “u15088888” | Valid | “guest” | Invalid | Show error | Editing permissions granted, but no further functionality supported |
| 6 | “u15099999” | Valid | “u15088888” | Valid | “jipper” | Invalid | Show error | Editing permissions granted, but no further functionality supported |
| 7 | “u15099999” | Valid | “” | Invalid | “admin” | Valid | Show error | Editing permissions granted, but no further functionality supported |

# Non-functional requirements:

1. Security
2. User interface
3. Performance

# Case 1: Security

* It is possible to change your user privileges to admin by changing the status of the user in the URL to “admin” at any page.
  + Once changing status to admin the users can officially give admin rights to themselves and other users.
* Users can edit their user information to be empty strings especially for the password.
  + A password is not required to change the password or any other user information.
* Users can login as other users by changing the user field in the URL to any valid user name.

# Case 2: User interface

* Features are hidden based on user status i.e. manage users tab is hidden to guest users, but is visible to admin users

# Case 3: Performance

|  |  |
| --- | --- |
| Functionality | Time to load (ms) |
| Login | 8 |
| Register | 12 |
| Profile | 9 |
| Manage users | 8 |
| Average | 9.25 |

Performance-wise the pages were relatively fast and had nearly no noticeable loading time.