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1. Functional requirements for Login:

1. If the user enters a valid username and password combination, redirect the user to the 'home' page using the URL http://localhost:2000/home/ after successful login.

2. Invalid Credentials: - If the user enters invalid credentials (i.e., the username and password combination is incorrect), display the error message: "Invalid credentials". redirect the login page again (http://localhost:2000/), allowing the user to attempt login with valid credentials.

2. Functional requirements for registration.

1. User Input Validation:

The system should validate the following user inputs:

- First name: Should only contain letters. If invalid, display the error message: "First name should only contain letters."
- Last name: Should only contain letters. If invalid, display the error message: "Last name should only contain letters."
- Username: Should only contain letters. If invalid, display the error message: "Username should only contain letters."
- Phone number: Should be in the format (123) 456-7890.. If invalid, display the error message: "Phone number must be in the format: (123) 456-7890.."
- If any of the input validations fail, the system should display the corresponding error message and redirect the user back to the registration page.

2. Unique Username and Email:

The system should check if the entered username and email address are already registered. If they are already in use, display the following error messages:

- Username already exists: "Username already exists."
- Email already exists: "Email already exists."
- After displaying the error message, redirect the user back to the registration page.

3. Password Validation:

The system should compare the entered passwords (password1 and password2) to ensure they match.

- If the passwords do not match, display the error message: "Passwords do not match." Redirect the user back to the registration page.

4. User Creation:

- If all input validations pass and the passwords match, the system should create a new user account with the provided information.
    - 4.1 After successfully creating the user account, display the success message: "User successfully created. Please login using username and password."
    - 4.2 Redirect the user to the login page.

3. Functional requirements for Logout.

1. Only login user can be logout.

2. After successful logout, the user redirects to the 'login' page (login URL).

4. Functional requirements for home page.

1. Authentication:

- Only authenticated users should be able to access the home page.
- If a user tries to access the home page without being authenticated, they should be redirected to the login page.

2. Displaying Registered Users:

- The home page should display a list of registered users.
- The table should have the following columns:
    - Username: Display the user's first name and last name.
    - Email: Display the user's email address.
    - Role: Display the user's role.
    - View: Provide a link/button to view more details about the user.
    - Update: Provide a link/button to update the user's information.
    - Delete: Provide a link/button to delete the user from the system.

3. User Actions:

- For each user in the table, there should be links/buttons to perform certain actions:
- View: Clicking on the "View" link/button should navigate to a page where detailed information about the user is displayed.
- Update: Clicking on the "Update" link/button should navigate to a page where the user's information can be updated.
- Delete: Clicking on the "Delete" link/button should delete the user from the system.

4. Flash Messages:

C0 - Personal Information

- The flash messages can indicate success or error messages related to user actions, such as successful for update, or deletion, or any errors that occur during these actions.
- The flash messages should be displayed in an alert container at the top of the page.
- Each alert should have a close button to dismiss the message.

5. Navigation:

- Clicking on the "QA-Test-Tool" link in the navigation menu should refresh the home page.
- The navigation menu should also include a "Log out" link that allows the user to log out from the system.

6. No Registered Users:

- If there are no registered users, a message should be displayed on the home page indicating that there are no registered users yet.

7. Footer:

- The home page should include a footer section with the copyright information and a link to the Craft Knowledge website.

5. Functional requirements for view page.

1. Authentication:

- Only authenticated users should be able to access the user detail page.
- If a user tries to access the user detail page without being authenticated, they should be redirected to the login page.

2. User Detail Display:

The user detail page should display the following information about the user:

- Full Name: The user's first name and last name should be displayed.
- Username: The user's username should be displayed.
- Email: The user's email address should be displayed.
- Role: The user's role should be displayed.
- Date of Birth: The user's date of birth should be displayed.
- Address: The user's address should be displayed.

3. Navigation:

- Clicking on the "QA-Test-Tool" link in the navigation menu should navigate the user to the home page.
- The navigation menu should also include a "Log out" link that allows the user to log out from the system.

4. Footer:

- The user detail page should include a footer section with the copyright information and a link to the Craft Knowledge website.

6. Functional requirements for update page.

1. Authentication:

- Only authenticated users should be able to access the user detail page.
- If a user tries to access the user detail page without being authenticated, they should be redirected to the login page.

2. Update User Information:

- If the user submits the update form with empty or invalid fields, the system should display appropriate error messages next to each field indicating the validation errors. For example:
- First name: "First name can only contain letters."
- Last name: "Last name can only contain letters."
- Email: "Please enter a valid email address."
- Phone number: "Phone number must be in the format: (123) 456-7890."
- Date of birth: "Age must be above 20 years."

3. Successful Update:

- If all input data passes the validation checks and the user information is successfully updated, the system should display a success message stating, "User information updated successfully."

4. Navigation:

- Clicking on the "QA-Test-Tool" link in the navigation menu should navigate the user to the home page.
- The navigation menu should also include a "Log out" link that allows the user to log out from the system.

5. Footer:

- The user detail page should include a footer section with the copyright information and a link to the Craft Knowledge website.

7. Functional requirements for Delete option.

1. User Authentication:

- The system should require users to authenticate before accessing the "Delete User" feature.Only authenticated users should be able to access and use the feature.
- Unauthorized users should be redirected to the login page.

2. Delete User:

- The system should allow users with the role of administrator to delete other user accounts.
- If the user attempting to delete the account has the role of 'User', the system should display an error message stating, "Sorry, this action is not allowed for you! It can only be done by the administrator."

3. Prevent Self-Deletion:

- The system should prevent users from deleting their own accounts.
- If a user attempts to delete their own account, the system should display an error message stating, "You cannot delete your own account."

4. Successful Deletion:

- If the user has the role of administrator and is deleting another user's account, the system should delete the user account from the database.
- After successful deletion, the system should display a success message stating, "User deleted successfully."

5. Redirect to Home Page:

- After attempting to delete a user account, the system should redirect the user to the home page, regardless of the deletion attempt.