VIETNAM NATIONAL UNIVERSITY OF HO CHI MINH CITY

THE INTERNATIONAL UNIVERSITY

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

Web Application Development - IT093IU

Lab 6: AUTHENTICATION & SESSION MANAGEMENT

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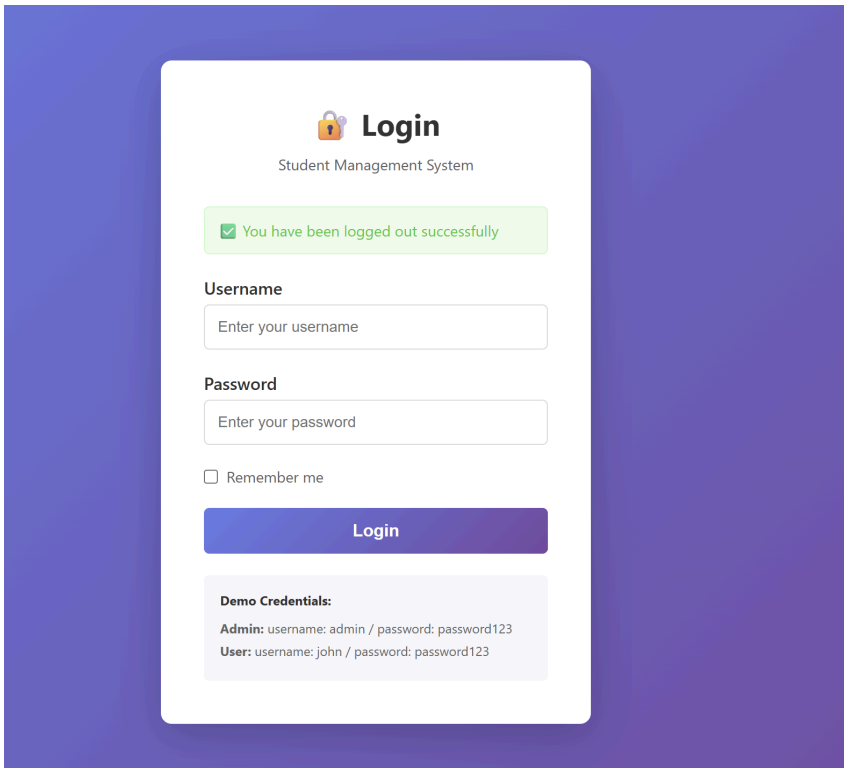
Github Links:

https://github.com/ngvuthtinh/Web_Lab/tree/main/Lab_6

Test Login Flow

1. Access homepage

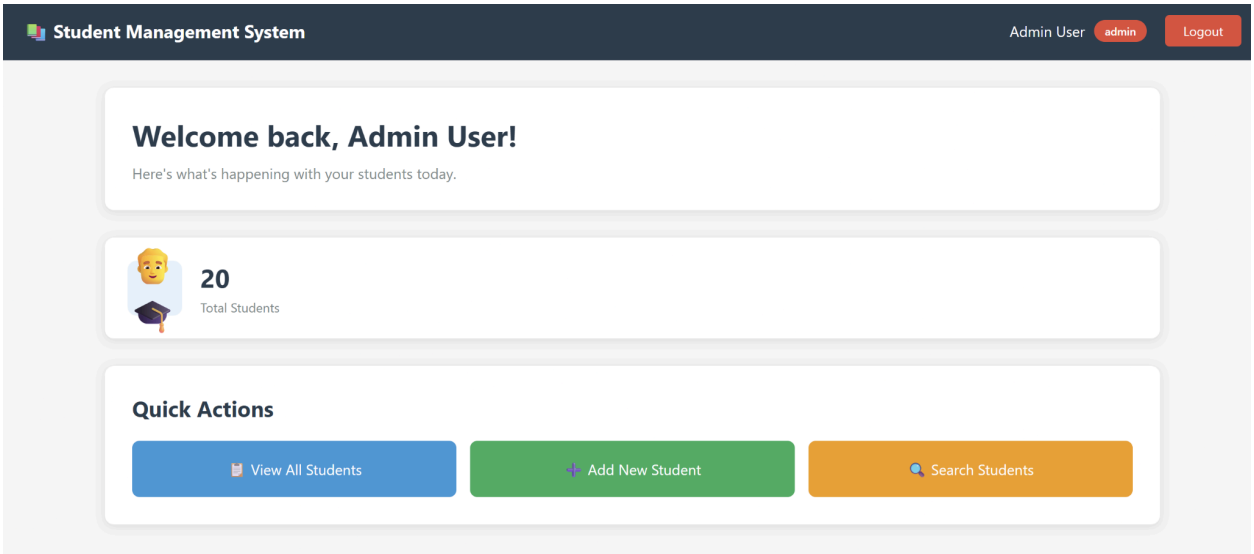
- User accesses: http://localhost:8080/StudentManagementMVC/
- The request passes through AuthFilter (file: filter/AuthFilter.java).
- AuthFilter checks whether a session exists:
    - If session is null, user is not logged in.
    - AuthFilter redirects the user to "login".
- The redirected request is handled by LoginController.doGet() (file: controller/LoginController.java).
- LoginController forwards the request to: views/login.jsp



2. Logging in as Admin (admin / password123)

- User submits login form in login.jsp with action="login" method="post".
- Request is processed by LoginController.doPost().
- Controller retrieves:
    - username = request.getParameter("username")

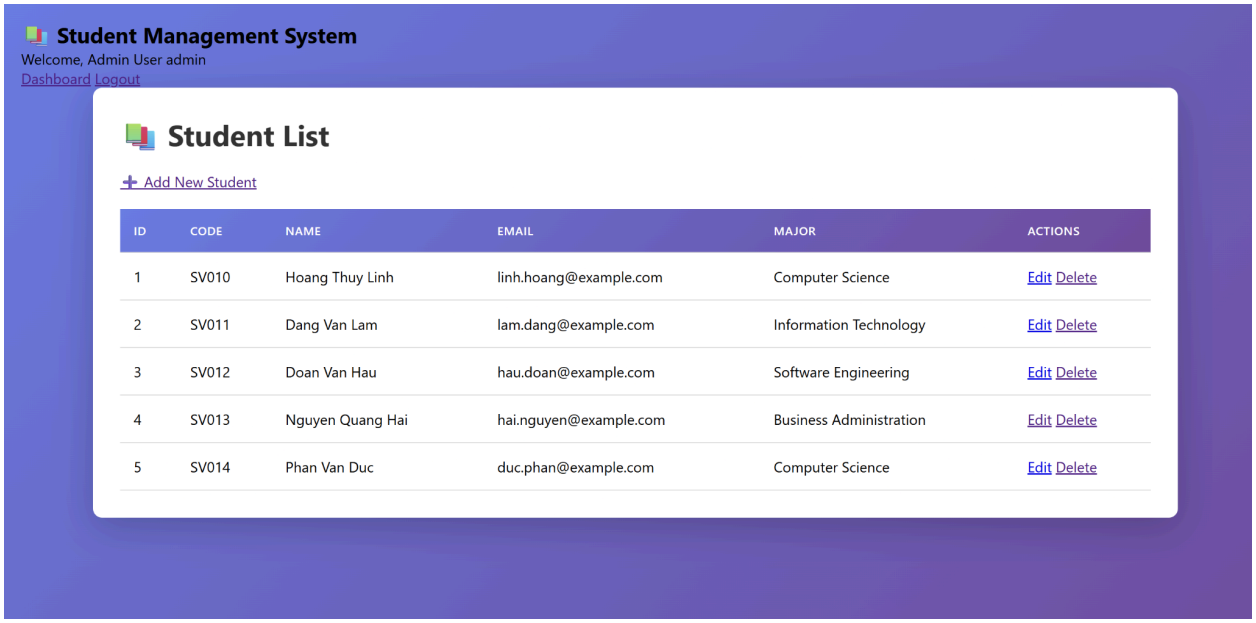
    - password = request.getParameter("password")
- Controller calls UserDAO.authenticate(username, password)
- (File: dao/UserDAO.java)
- Inside authenticate():
    - SQL executed: SELECT * FROM users WHERE username = ? AND is_active = TRUE
    - If a record exists:
        - Retrieve hashed password
        - Validate with BCrypt.checkpw()
    - If validation succeeds, User object is returned.
- LoginController creates a new session: session.setAttribute("user", user)
- If user role is "admin", LoginController redirects to "/dashboard".
- Request reaches DashboardController.doGet() → forwards to views/dashboard.jsp



3. Viewing the Student List

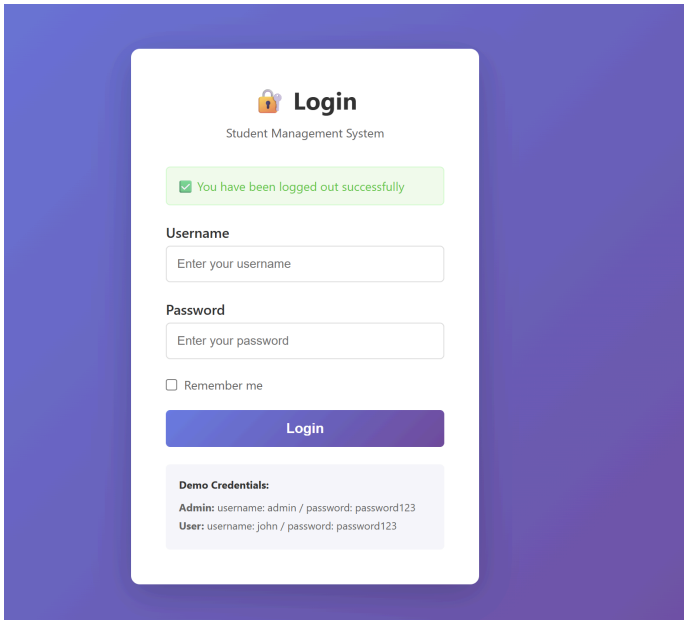
- Admin clicks "View All Students" which sends request to:
  /student?action=list
- Request passes through AuthFilter (session exists, so allowed).
- Request is handled by StudentController.doGet() (file: controller/StudentController.java).
- Controller checks action parameter:
  action = "list"
- Controller calls:
  studentDAO.getAllStudents()
  (File: dao/StudentDAO.java)
- Inside getAllStudents():
    - SQL executed: SELECT * FROM students
    - ResultSet is mapped into a List<Student>

- Controller forwards request to:
  views/student-list.jsp*
- Because user role is admin:
  - Edit and Delete buttons are displayed.



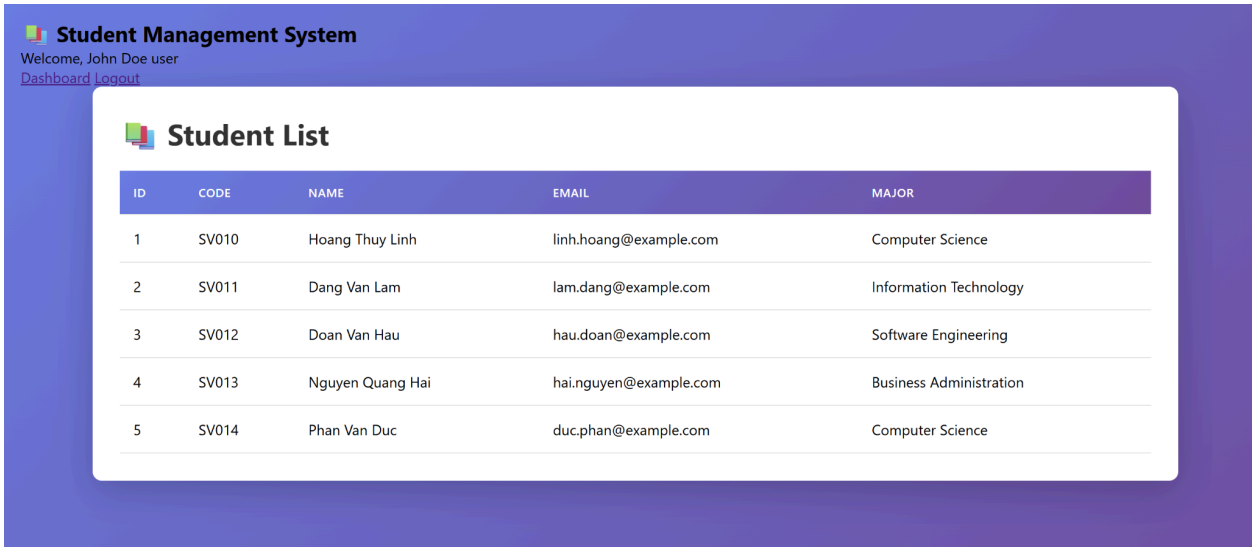
4. Logging Out

- User clicks logout which sends request to:
  /logout
- Request hits LogoutController.doGet() (file: controller/LogoutController.java)
- Controller invalidates session using:
  session.invalidate()
- User is redirected back to /login
- AuthFilter again forces display of login.jsp because session is gone.



5. Logging in as Regular User (john / password123)

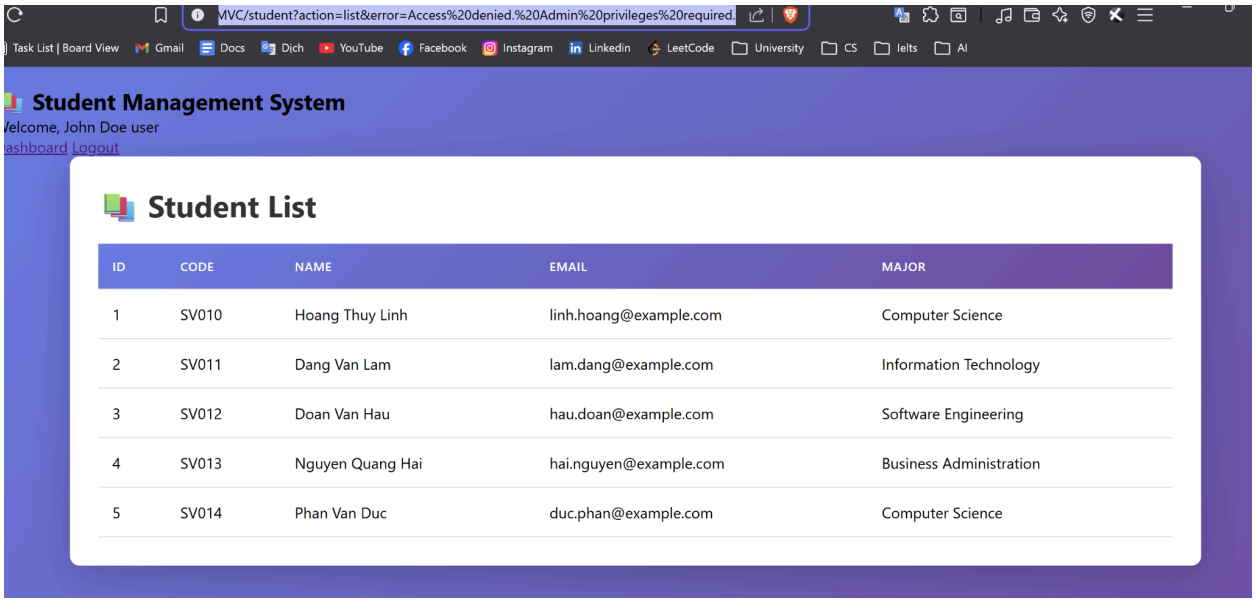
- User submits login through login.jsp
- LoginController.doPost() → UserDAO.authenticate() → BCrypt password check
- A "user" role is returned instead of "admin"
- LoginController redirects regular users to:
  /student?action=list
- StudentController loads student list and forwards to student-list.jsp
- In JSP, role is checked and:
  - Edit and Delete buttons are hidden



6. Attempting to Access Admin-Only Function

- When a regular user manually enters the URL:
  /student?action=new
- The request passes through AuthFilter (session exists) but then reaches AdminFilter.
- In AdminFilter.doFilter(), the system checks the user role:
  if (!user.isAdmin()) { block }
- Since the logged-in user has role "user", AdminFilter blocks the request.
- Depending on the implementation, the blocked request typically results in:
  - A forced redirect (e.g., back to login or dashboard), or
  - An empty/blank response, or
  - No access to the target JSP.
- Because no custom error page is provided, the browser URL will still display /student?action=new, but the content will not appear.

URL shows access denied:
http://localhost:8080/Student_Management_MVC/student?action=list&error=Access%20denied.%20Admin%20privileges%20required.



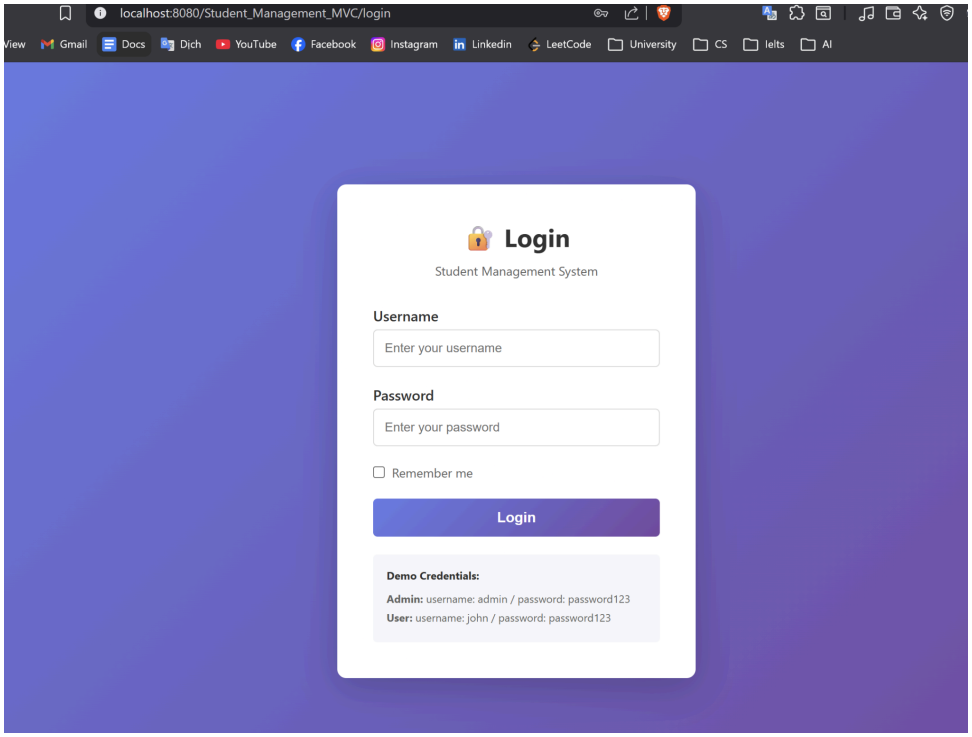
Test URLs

1. Public URLs (no login required)

1) URL: /login

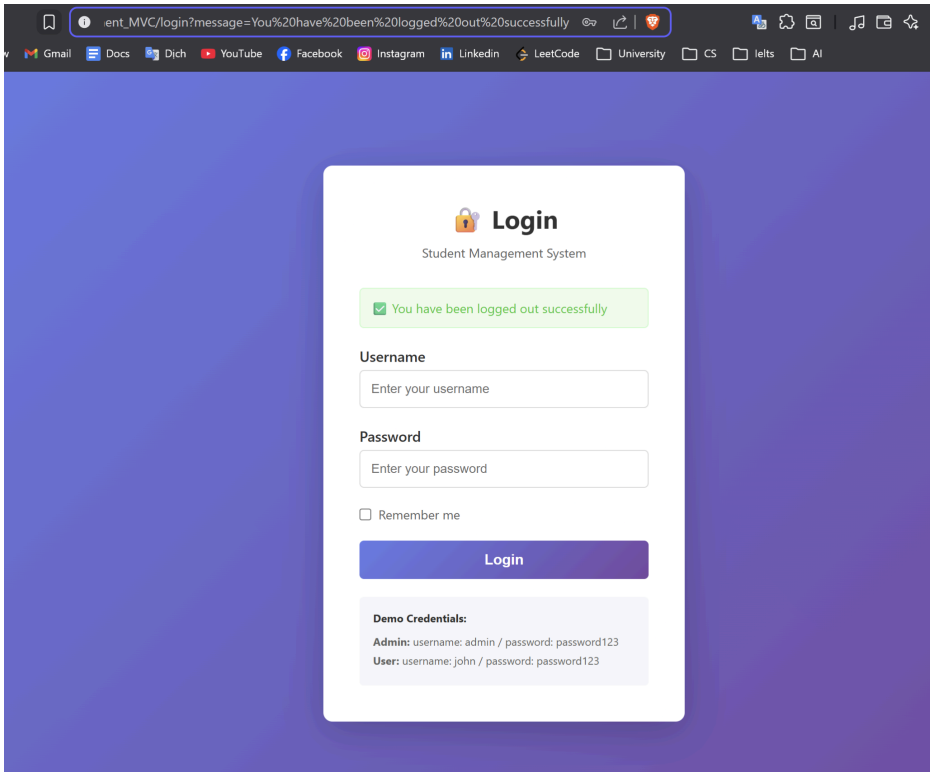
- This URL is mapped to LoginController (file: controller/LoginController.java).
- For a GET request:
  - LoginController.doGet() is executed.
  - It checks if there is already a logged-in user in session:

        - If a session with attribute "user" exists, it redirects to "dashboard".
        - Otherwise, it forwards the request to views/login.jsp to display the login form.
- For a POST request:
    - LoginController.doPost() handles the login form submission.
    - It reads the username and password parameters, then calls UserDAO.authenticate().
    - Based on the result, it either:
        - Creates a session and redirects to the appropriate page (dashboard or student list), or
        - Returns to login.jsp with an error message.



2) URL: /logout

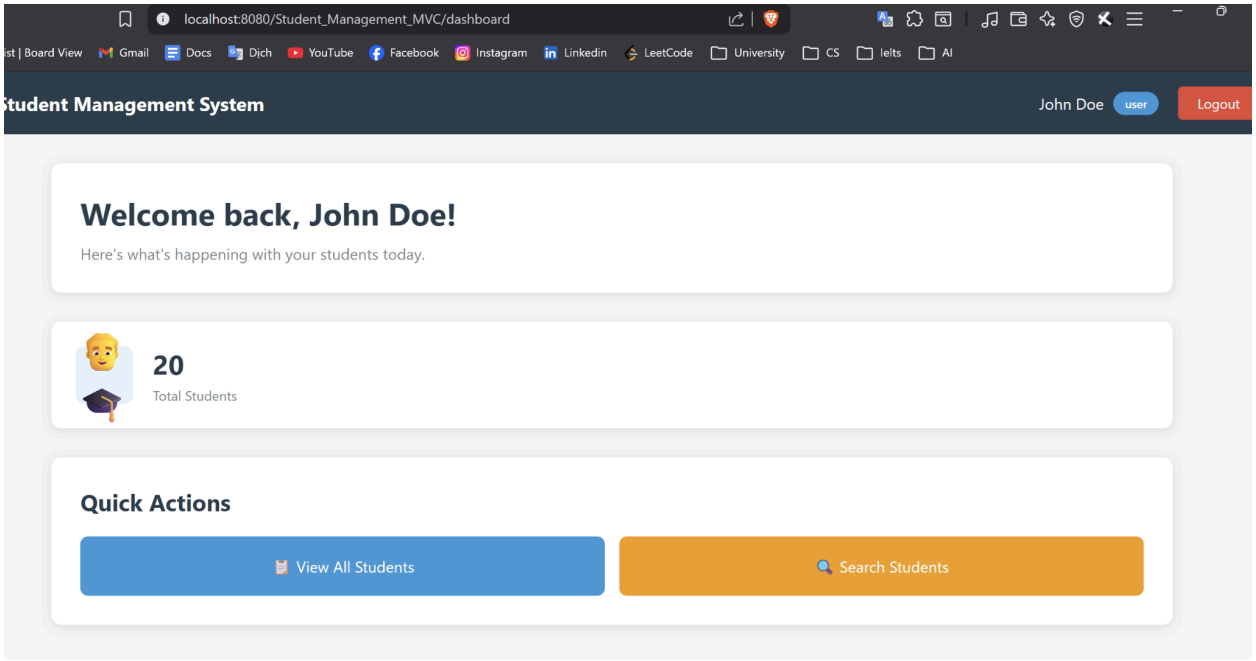
- This URL is mapped to LogoutController (file: controller/LogoutController.java).
- LogoutController.doGet() is called when /logout is requested.
- The controller does:
    - Retrieves the current session if it exists.
    - Invalidates the session using session.invalidate().
    - Redirects the user back to /login.
- After this, any protected URL will again be blocked by AuthFilter until the user logs in again.



2. Protected URLs (login required)

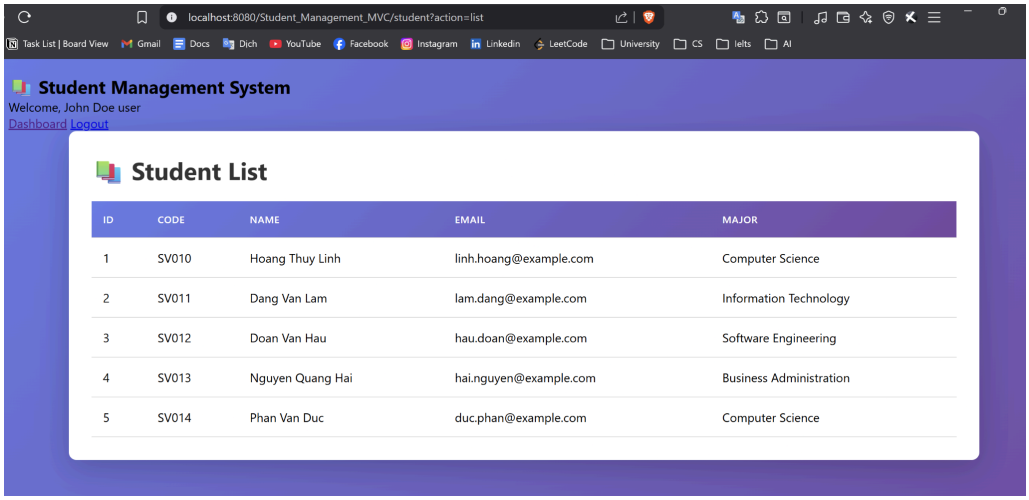
1) URL: /dashboard

- When user requests /dashboard, the request first passes through AuthFilter.
- AuthFilter:
    - Checks for an active session and the presence of session.getAttribute("user").
    - If no user in session, it redirects the request to /login.
    - If a user is present, it allows the request to continue.
- The request is then handled by DashboardController (file: controller/DashboardController.java).
- DashboardController.doGet():
    - May load any summary/statistics needed for the dashboard.
    - Forwards to the JSP page: views/dashboard.jsp.



2) URL: /student?action=list

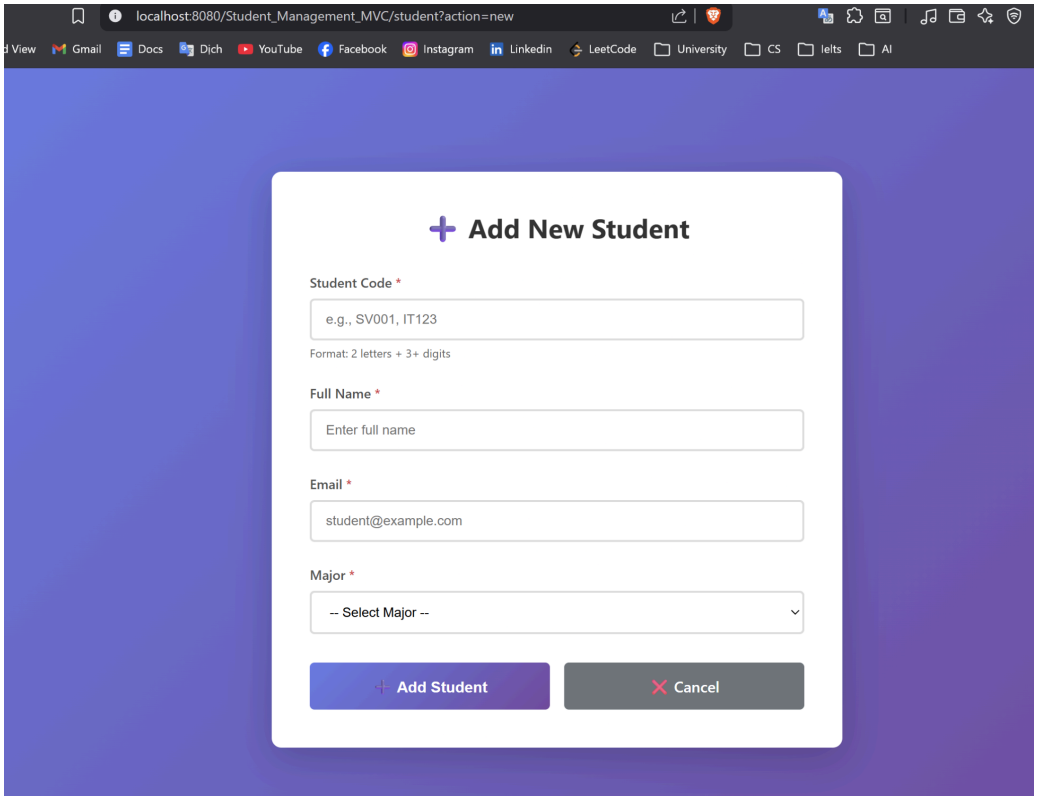
- This URL is also protected by AuthFilter.
    - If user is not logged in, AuthFilter redirects to /login.
    - If user is logged in (either admin or normal user), the request is allowed.
- The request is mapped to StudentController (file: controller/StudentController.java).
- StudentController.doGet():
    - Reads action parameter from the request.
    - When action = "list":
        - Calls studentDAO.getAllStudents() in StudentDAO (file: dao/StudentDAO.java).
        - Retrieves the list of students from the students table in the database.
        - Attaches this list to the request as an attribute.
        - Forwards to views/student-list.jsp to render the data.
- On the JSP side:
    - The page renders the table of students.
    - It may show or hide admin actions (Edit/Delete) depending on the user role.



3. Admin-only URLs (must be logged in and have admin role)

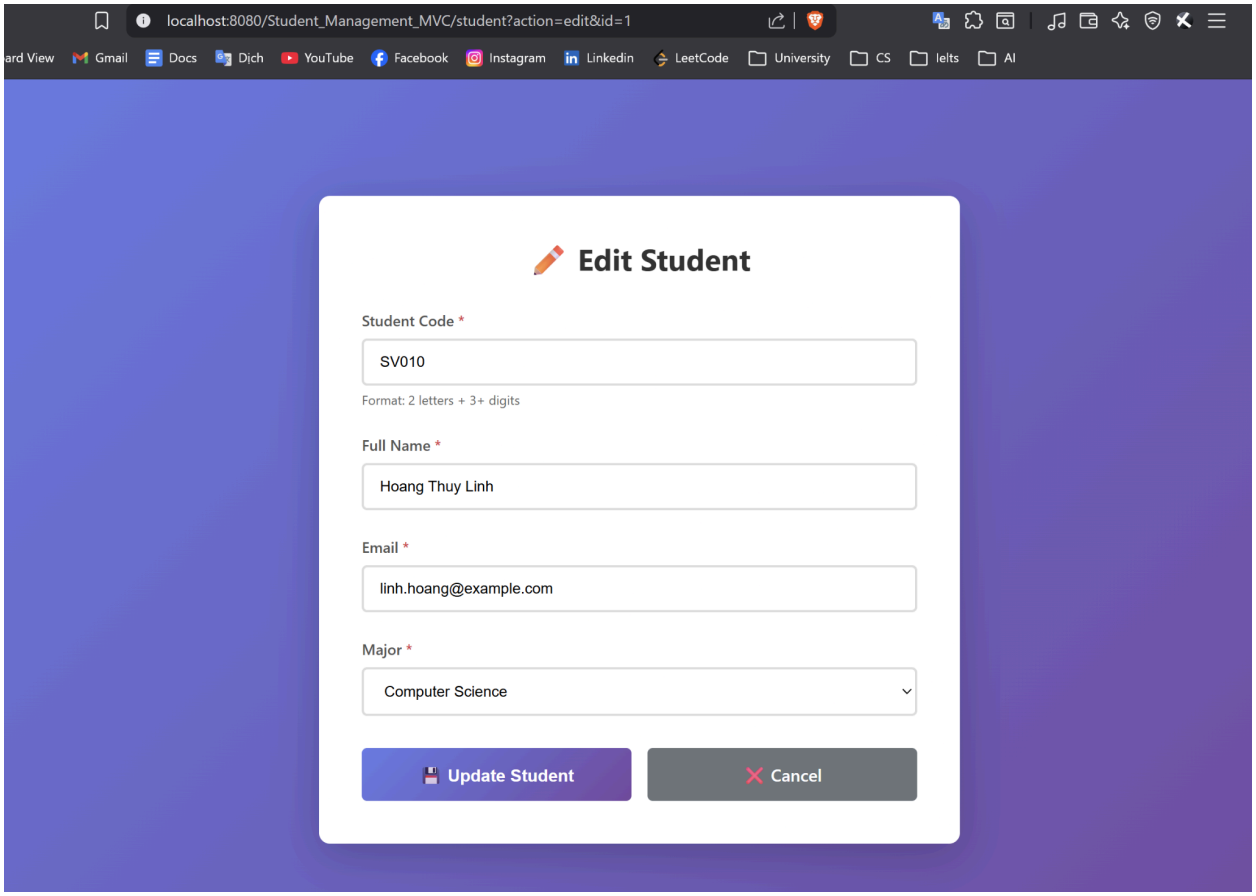
1) URL: /student?action=new

- Request passes through AuthFilter:
  - If no session → redirected to /login.
  - If logged in → continues.
- Then request passes through AdminFilter (file: filter/AdminFilter.java):
  - Retrieves user from session.
  - If user role is not admin:
    - Access is blocked (redirect to another page or show error).
  - If user is admin:
    - Request continues to StudentController.
- In StudentController.doGet():
  - If action = "new":
    - It forwards to views/student-form.jsp with an empty form for creating a new student.



2) URL: /student?action=edit&id=1

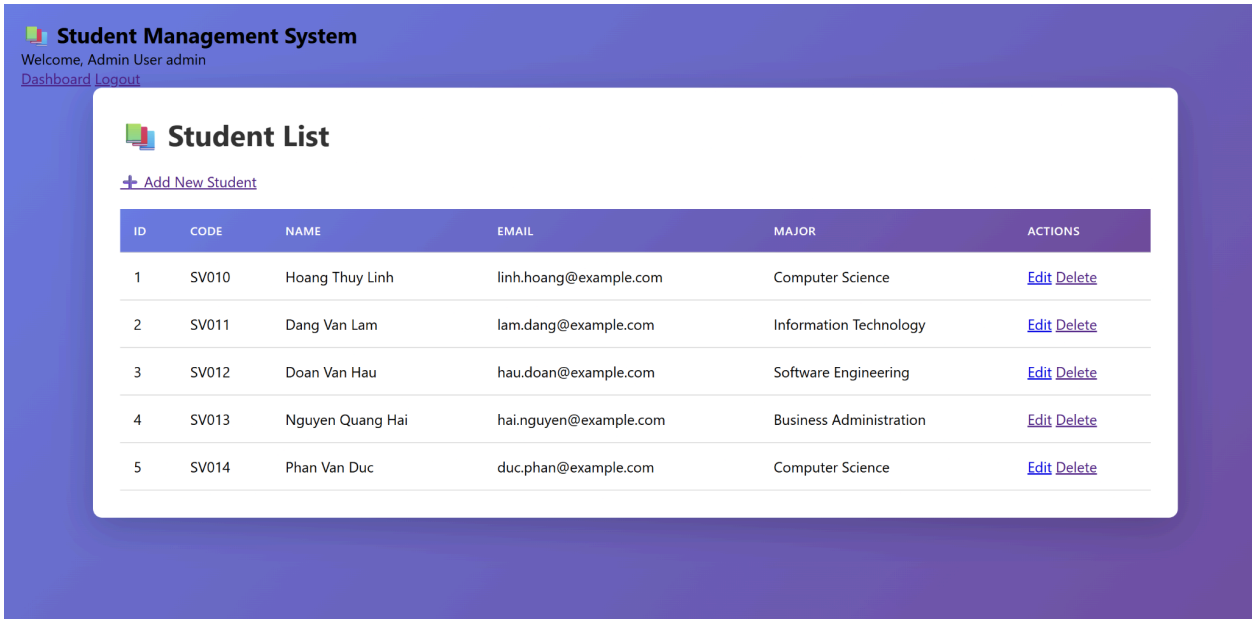
- Again, the request is filtered by AuthFilter → must be logged in.
- Then it is filtered by AdminFilter → must be admin.
- If checks pass, StudentController.doGet() is executed:
    - Reads parameters action="edit" and id.
    - Calls studentDAO.getStudentById(id) to fetch data from DB.
    - Sets the Student object as a request attribute.
    - Forwards to views/student-form.jsp, this time with fields pre-filled for editing.



3) URL: /student?action=delete&id=1

- Protected by both AuthFilter and AdminFilter:
  - User must be logged in.
  - User must have admin role.
- If allowed, StudentController.doGet() handles it:
  - Reads action="delete" and id.
  - Calls studentDAO.deleteStudent(id) to remove the record from DB.
  - Redirects back to /student?action=list to show updated student list.

Before



After