

# Security Analysis

Firstly, there was work done in order to prevent Cross Site Scripting (XSS). In the Security part of the module, we learnt that XSS can be performed by the attacker using the script tag, the alert keyword and the attributes onload and onerror of the img tag. So, in order to prevent XSS, inside every input box, a method XSSInputSanitation(id) is called which takes in the id of the input box and is called whenever someone enters text. What this method does is, whenever it comes across <script>, onload, alert and onerror, the input box is cleared and that input is not accepted.

Secondly, to prevent SQL injection, prepared statements were used throughout our project to send queries to the database, in order to prevent the mixing of code and data. Logging in as an admin without the correct credentials is usually done using SQL injection but it practically can not work in our implementation since authentication is done by getting the stored hash of the password for a particular user and using the ARGON2 library to check if the password is valid by comparing it to the hash. This authentication is not done by simply checking if a record exists in the database. The user's password is hashed using a library that implements the ARGON2 algorithm.

Thirdly, in our implementation of authentication, credentials are needed to log in and the JWT token is used. With a secret signing key stored on the server, the SHA256 hashing algorithm and the timestamp of the issue is used to protect against a replay attack at a later time. The JWT token is produced by the server and attached to the cookie. This can not be reproduced without the secret signing key stored at the server. Without a token, a user is not allowed to log in and the user will get a 'bad request' error with code 400. With JWT, it is possible to specify the validity of the token. So, we specified the validity of the token and it expires in 2 hours. Thus, the user is required to log in every two hours. Logging in elsewhere revokes the old token.

Lastly, for authorization, there is a role assigned to each user. This means that not all users can use all the functionality of the website. This was implemented using the custom @Secured annotation.