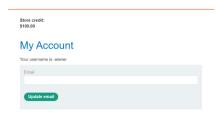
# **Application logic vulnerabilities**

#### LAB 45 Excessive trust in client-side controls

I was provided with an account of user wiener: peter that has \$100 on his account:

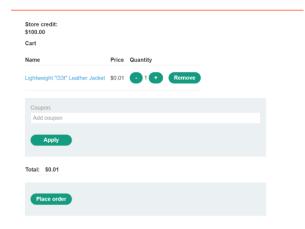


I was asked to buy "Lightweight "I33t" Leather Jacket" that costs \$1337.

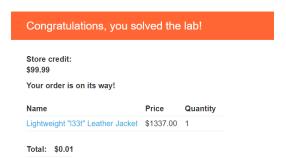
To do so, I tested the order making process by adding goods to the cart and trying to spend money. I have noticed, that, when adding an item to the cart, it contains price parameter:



I changed the value of this parameter to "1" and observed that the price in the cart has changed:



What is left is to place the order and demonstrate, how order has been made with exploiting site's purchase making logic:



#### LAB 46 High-level logic vulnerability

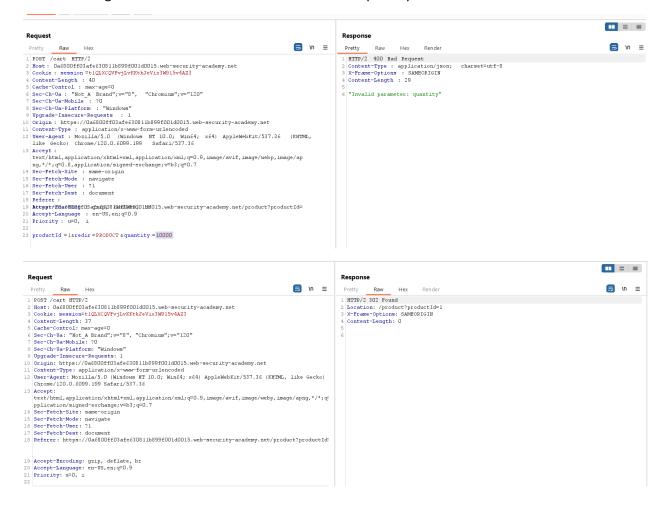
This lab is similar to the previous one, however, this time it does not contain price parameter. However, there is 'quantity' parameter left when adding an item to a cart. Changing its value does change the value of the item in the cart, and there was no handling of passing negative quantities that could lead to decreasing of the price of items in the cart. In such a way, I was able to decrease the amount of leather jacket and purchase it for the \$12 (it's possible to make it even cheaper):



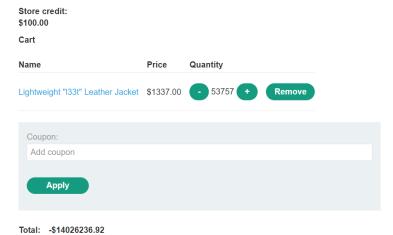
However, there is a correct assumption tat price of cart cannot be lower than 0, so I couldn't add myself extra money in such a way.

#### LAB 47 Low-level logic flaw

In this lab, everything remains the same, but this time negative quantities are handled nicely: if there is negative quantity, then it will remove the item from cart. I tried to go in opposite way and increase amount to huge numbers and discovered that maximum quantity that could be set is 99:



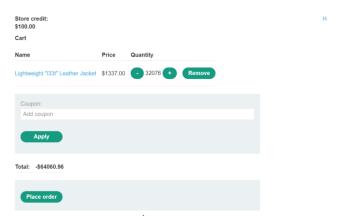
Automatically repeating this request in Burp Intruder and increasing the amount by 99, I noticed that at certain point the price becomes negative:



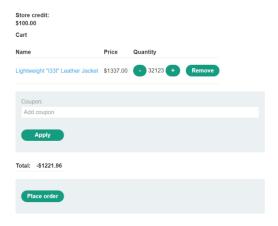
This could mean that price number becomes that large, so it exceeds its data type limit and loops back to negative values back to 0 and so on. Knowing that, typically, integer limit in most languages is normally [-2,147,483,647; 2,147,483,647] and for float it's 3.4E +/- 38, I can mathematically compute the quantity number to loop back to zero. Before I start with integers, I noticed that price is kept without floating points, so our jacket will cost \$133700 instead of \$1337.00:

133700 x 99 = 13 236 300 2 x 2,147,483,647 / 13 236 300 = 324,5

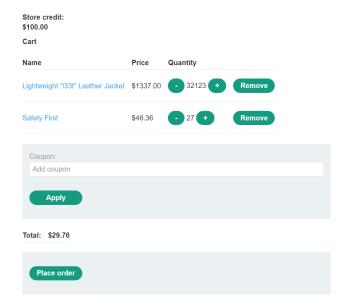
Therefore, I will add order of 99 jackets exactly 323 times to be sure that price remains negative:

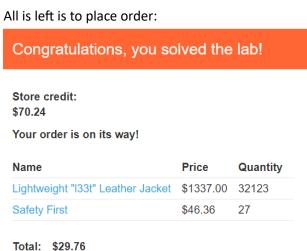


I need to add 6406096/13700 = 47 jackets to cart to be maximally close to \$0:



Now, I will simply select any other product (obviously, not too expensive, easy scalable) from the catalogue to reach \$0:





# LAB 48 Inconsistent handling of exceptional input

Using Burp, I fuzzed the website on its contents and /admin was discovered. It contained the following message:

Admin interface only available if logged in as a DontWannaCry user

Since I was not provided with any account, I created it myself to test the website as registered user this time. Having multiple accounts registered, I found out that user's email (which can be a very long string) on dashboard is being truncated when displayed:



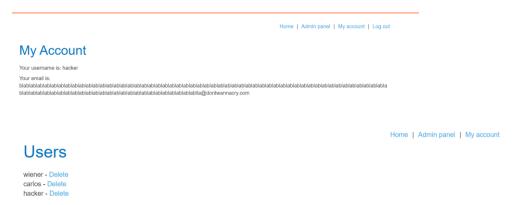
This account was registered with email (436 character long):

The application truncated it up to 255 characters, so my idea was to try to register a user with @dontwannacry.com domain with last symbol 'm' on 255<sup>th</sup> position:

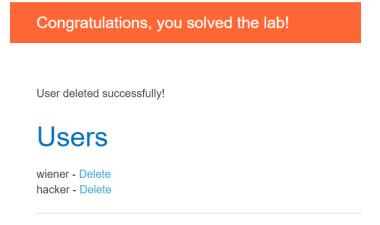
Having such a payload, I received a registration confirmation email:



Next, I checked the account and discovered that admin panel is now available to me:



Now I can conduct malicious actions, such as deletion of accounts:

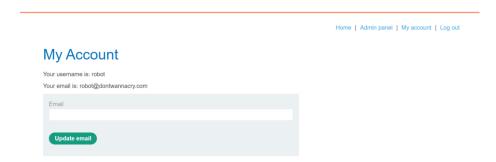


# **LAB 49 Inconsistent security controls**

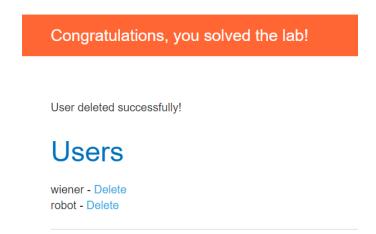
This lab also contains /admin directory with the same message. So, let's try to register an account again and see, what could be exploited:

# My Account Your username is: robot Your email is: robot@exploit-0a54005b04b71ede801720dc01800019.exploit-server.net Email Update email

I can change my email address. Surprisingly, new email with confirmation is not being sent and email changes right away. Therefore, I can exploit this by simply changing email to @@dontwannacry.com domain:



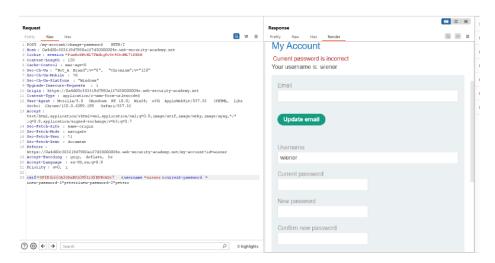
I have access to Admin panel again and can delete carlos account:



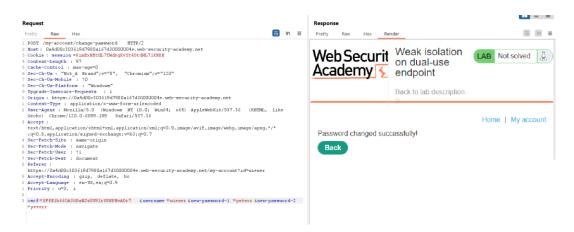
Valid user credentials: wiener:peter

The goal is to log in as administrator and delete user 'carlos'.

To achieve this, I inspected the behavior of changing password function. Firstly, I tried to pass empty parameter as "current password":



Having no success, I removed this parameter completely and managed to change the password for user "wiener":



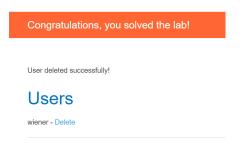
Next thing to do is to try to replace "wiener" value with "administrator" and change the password for admin without knowing the current password:



After successful change of administrator password, I was able to log in and got access to admin panel with users list:

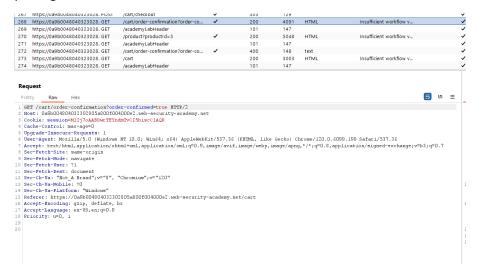


Simply delete carlos account and voila:

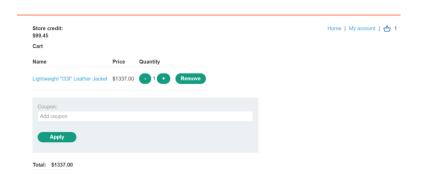


# LAB 51 Insufficient workflow validation

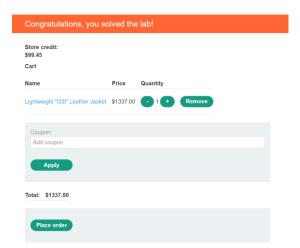
The application redirects user to a page /cart/order-confirmation?order-confirmed=true upon the placing the order:



My idea was to keep this request by sending it to Burp Repeater and then adding the jacket to the cart:



Then, I sent the request with positive order confirmation that I saved in Repeater and the order was finalized:



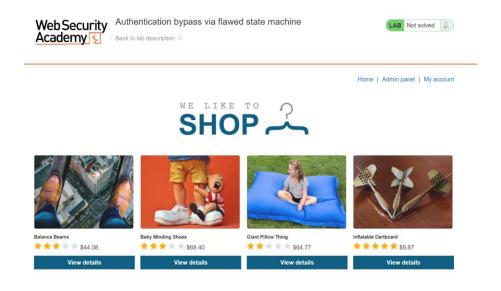
#### LAB 52 Authentication bypass via flawed state machine

In this lab, user is asked to choose his/her role: user or content author. Fuzzing of the website showed me that /admin directory is available, but the access is given only to administrator

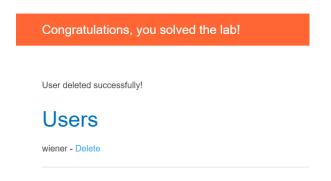
I could try to break the authentication sequence by dropping the role selection step packet:



After this, I headed onto home page and could see that Admin panel is now accessible:



#### Easy to delete accounts:

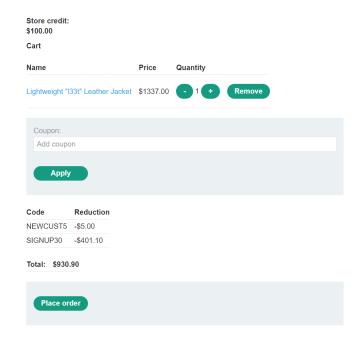


#### LAB 53 Flawed enforcement of business rules

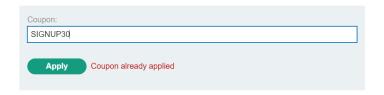
The online shop nicely offers coupon for new customers: NEWCUST5

Also, there is a coupon for newsletter subscription: SIGNUP30

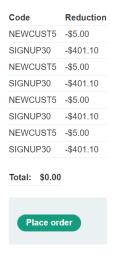
Applied these coupons to the expensive jacket:



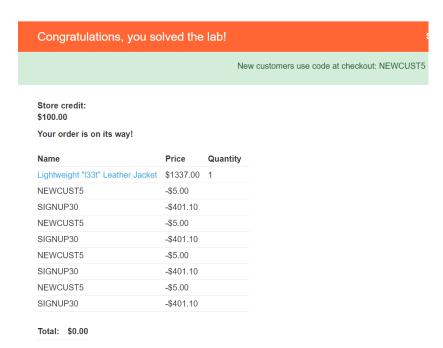
Still, I do not have enough money to complete the purchase, so I tried to add coupons again.



I noticed, that "Coupon already applied" error is showed just for the last applied coupon, and submitting the first coupon (NEWCUST5) was accepted. Then, it was possible to submit the sign up coupon again. This can be exploited by altering the entered coupons and this will reduce the price to zero:



#### Finish the order:



# LAB 54 Infinite money logic flaw

User: wiener:peter with starting balance \$100.

Newsletter coupon: SIGNUP30

I bought a \$10 gift card and applied this coupon to it, so I got 30% discount and bought a gift card:



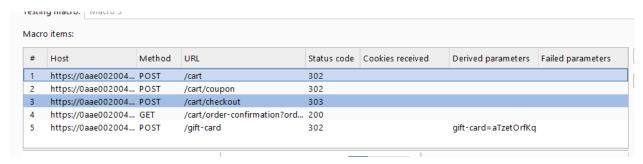
Then, I entered this gift card and got \$10 and, in the end, my final balance was \$103. I got 3 extra dollars. I can automate the process of buying a gift card, applying promocode to it and activating the giftcard and earn \$3 each time recursively, until I get sufficient money to buy the desired item.

To do this, I set up a small macro in Burp:



Configured GET /cart/order-confirmation?order-confirmed=true item and added gift-card parameter that is generated.

In POST /gift-card I selected gift-card parameter to take its value from prior request. This macro will add gift card into cart, apply coupon, checkout and then apply gift-card. Testing the macro:

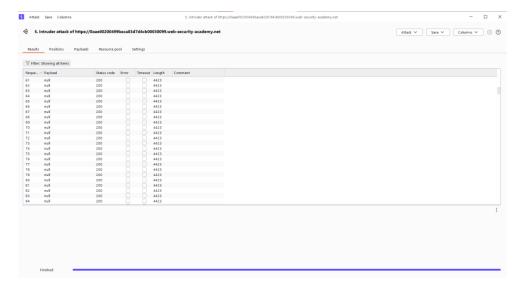


302 response received in the end and gift-card code matches, meaning that everything works.

Now, to automate this exploit, I will run this macro using Burp Intruder Sniper attack with NULL payloads:



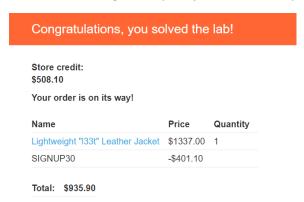
I selected 450 payloads to be generated as \$1337 (jacket price) divided by \$3 (extra money per cycle) is 445, so I will guaranteed get enough money for the purchase. I also limited concurrent threads of the attack to 1, so I will run attack exactly 450 times:



When my attack had finished, I got \$1444 on my account:

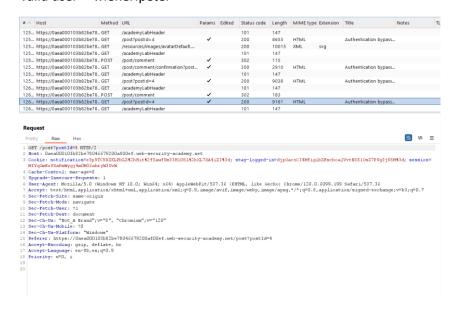
# Store credit: \$1444.00

Now, It was enough to buy the jacket for \$935 (yes, I applied the coupon even here):



# LAB 55 Authentication bypass via encryption oracle

#### Valid user -- wiener:peter



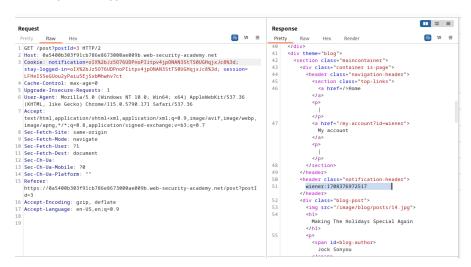
On screenshot above, I tested the functionality of the website, especially leaving the comment. Firstly, I did it in correct way and then tried edge cases, such as entering email of wrong format. I noticed, that after doing so, the notification cookie (encrypted) is being added to the packets. The notification itself appears on top of the page:

Invalid email address: dddd

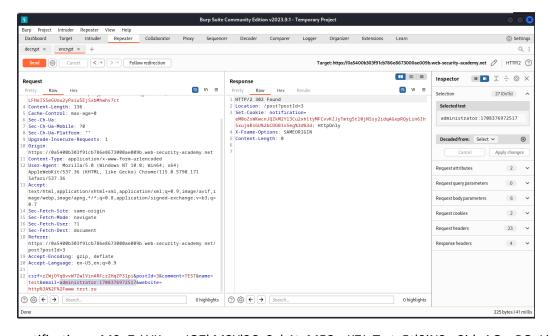


notification=eM0oZsWKwcnJQZkM2Yl3CkN2u%2b3Mkopz1X41vRb4Zkg%3d stay-logged-in=oIX%2bJz5O76UDPnoPlitpv4jpONAN3StTS0UGHqjxJc8%3d

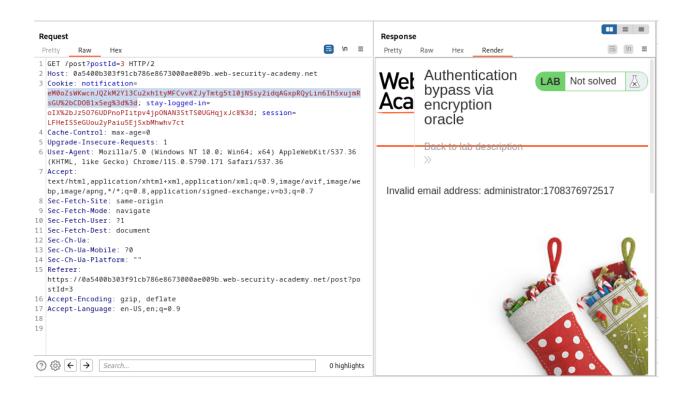
### Let's try to decrypt this:



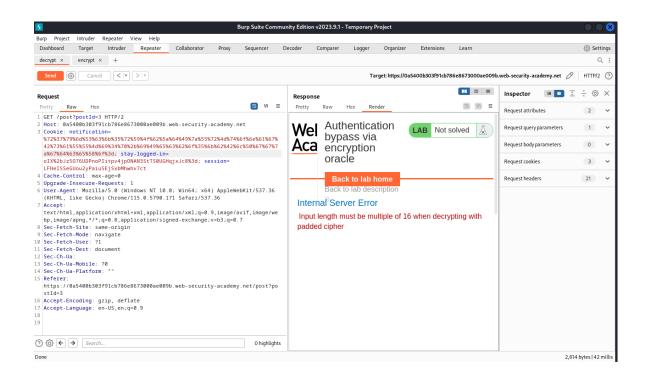
wiener:1708376972517

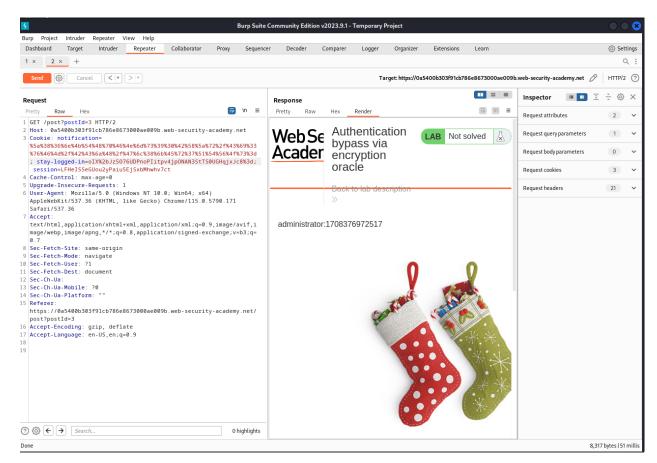


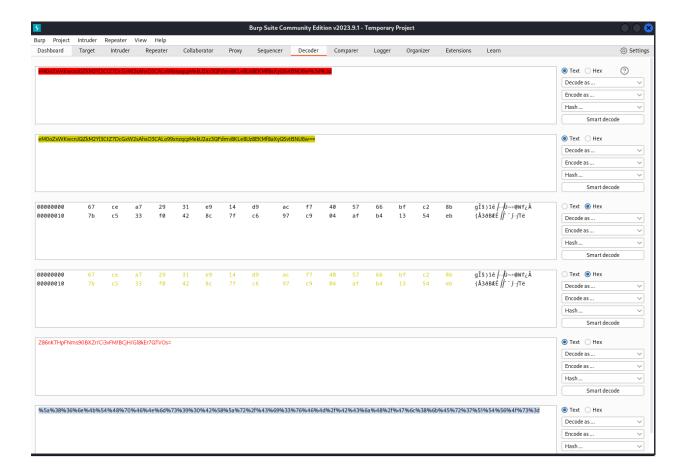
notification = eM0oZsWKwcnJQZkM2Yl3Cu2xh1tyMFCvvKZJyTmtg5tl0jNSsy2idqAGxpRQyLin6lh5xujmRsGU%2bCDOB1x5eg%3d%3d











eM0oZsWKwcnJQZkM2Yl3CtZ7DcGxW2sAhsO3CALo99xnzqcpMekU2az3QFdmv8KLe8Uz8EKMf8aXyQSvtBNU6w%3d%3d

