LA CTF — web/mutation `mutation` Writeup

Challenge: web/mutation mutation
Event: LA CTF / https://lac.tf/
Category: Web
Challenge Author: burturt
Writeup Author: Sunny Nguyen
Tools Used: Chrome DevTools (Mac)
Difficulty: Easy (but tricky if you're new to DevTools)

TL;DR

The page rapidly mutated its displayed content to make the flag hard to read manually. I used Chrome DevTools to **pause execution** from the **Sources** tab, then switched back to **Elements** and copied the flag while the DOM was frozen.

Challenge Description

> *"It's a free flag! You just gotta inspect the page to get it. Just be quick though… the flag is constantly mutating. Can you catch it before it changes? 🧬"*

The site elements constantly changed, making it hard to visually catch the flag before it mutated again.

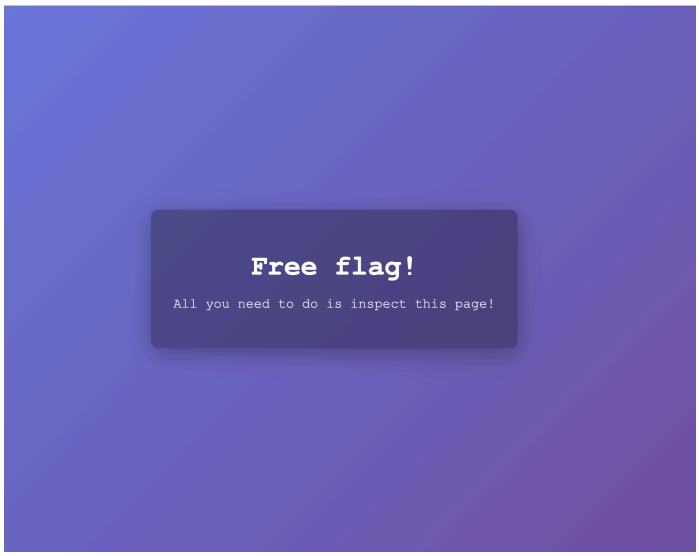
Objective

Capture the flag from a webpage where the DOM content changes rapidly.

Initial Analysis

When I first arrived at the challenge webpage, I noticed two things immediately:

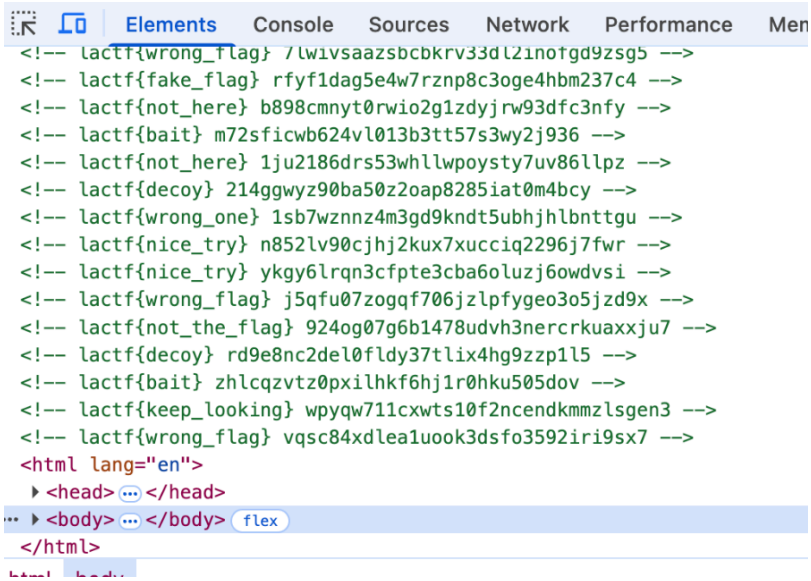
1. **Right-click was disabled**, so I couldn't inspect the page normally.



Since I was on Mac, I opened Chrome DevTools manually using:

- **Cmd + Option + I**

At this point, I could see the page content changing constantly in the Elements panel.



First idea (not ideal 😅)

My first thought was:

> “Maybe I can screenshot the screen and get lucky.”

This would technically work, but it’s unreliable and not really a good technique.

Investigation

I explored Chrome DevTools for a bit (I wasn’t very experienced with it yet), and found the page’s `index` source file.

However, the JavaScript logic was **obfuscated**, so reverse engineering it would’ve taken longer than necessary.

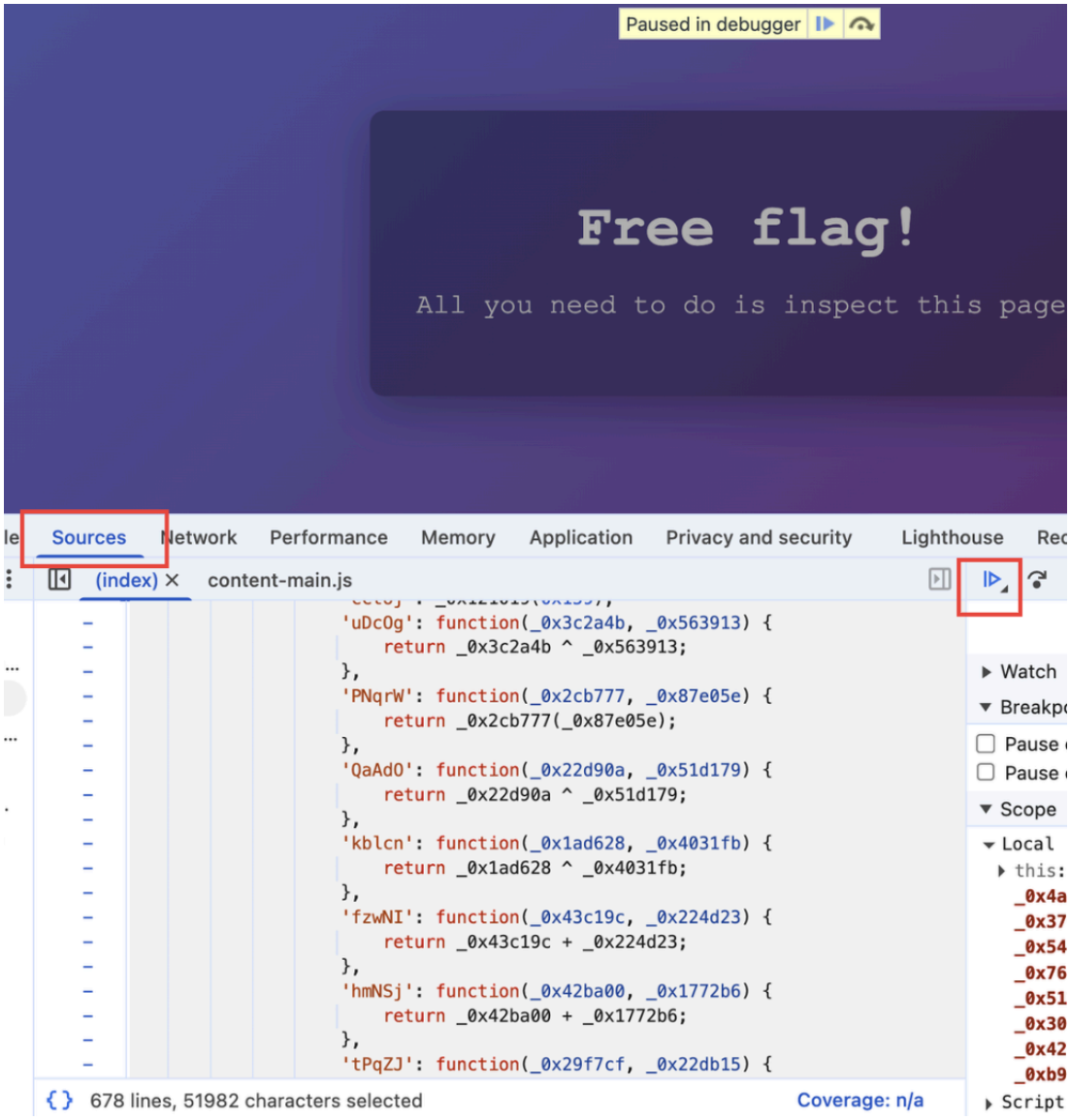
Instead of trying to deobfuscate the script, I looked for a faster approach.

Solution (What Worked)

The simplest solution was to **freeze the page** while the flag was visible.

Steps

1. Open **DevTools**
2. Go to the **Sources** tab
3. Click the **Pause** button (⏸) to pause JavaScript execution

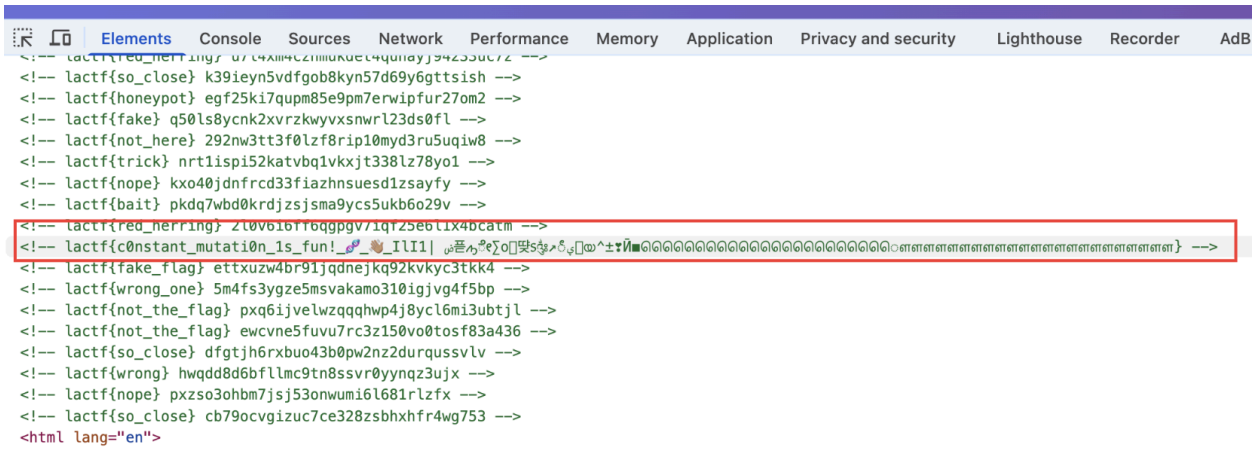


4. Switch back to the **Elements** tab
5. Scroll/look through the text output until finding a string matching a flag format (ex: `lactf{...}`)
6. Copy and paste the flag

Because the DOM was frozen while execution was paused, the flag stopped mutating long enough to copy it cleanly.

Result

I was able to successfully copy the flag directly from the frozen DOM.



What I Learned

- Even if right-click is disabled, you can still open DevTools with keyboard shortcuts.
- You don't always need to reverse engineer obfuscated JavaScript — sometimes there's a simpler way.
- **Pausing execution in the Sources tab** is a powerful trick for CTF web challenges where:
    - the DOM is changing rapidly
    - the flag flashes briefly
    - scripts are trying to hide content

Defensive Notes (Real-World Takeaway)

This kind of “security” is not real security — it’s just **client-side obfuscation**.

If a flag (or secret) exists in the client-side DOM at any point, a user can usually:

- freeze the DOM
- intercept responses
- view source
- dump memory/state
- or scrape the page