UnderTheCTF

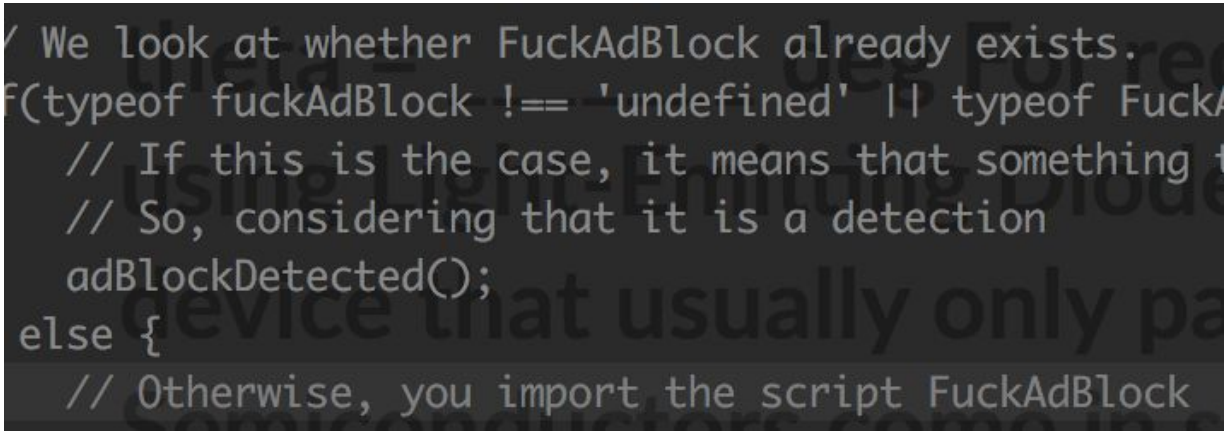
this is the part where we write the flag on the board

cyphercon

- milwaukee
- april
- sign up: https://docs.google.com/forms/d/1_0UMjMwvVCbgZRKNAkUAPbh5lfCcQy_5GmNotwZyt3g/edit?usp=drive_web

quick aside: textsheet.com

- free chegg (probably scrapes it using stolen / bought accounts
  - that or chegg doesn't actually check for abuse
- they display annoying surveys bc the person who made it wants money
- then they un-hide the answer
- fun snippet of the source code:



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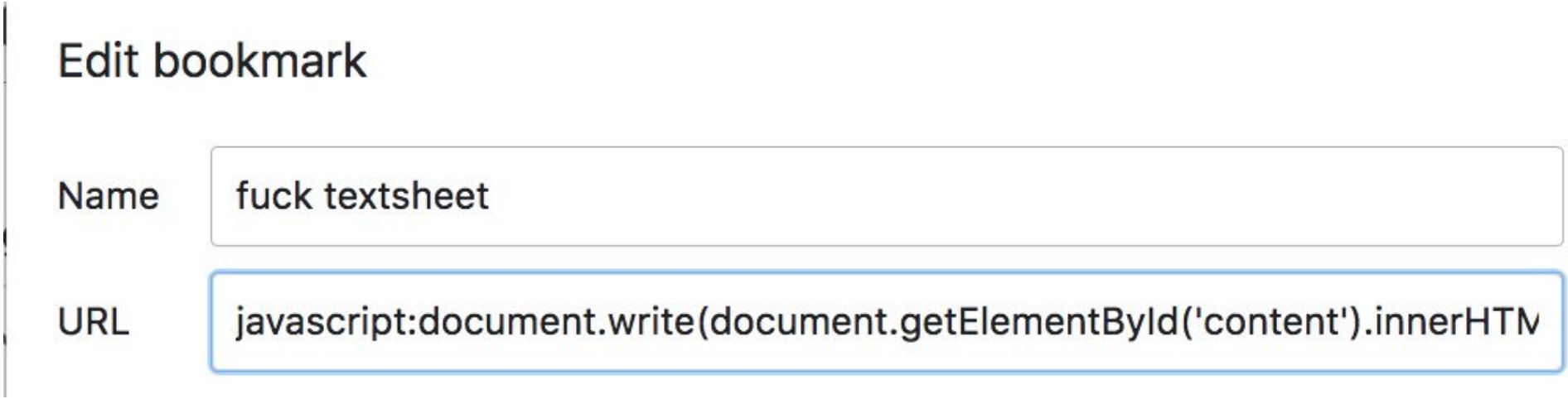
- anyway it’s trivial to bypass: the content you want has an id=”content”
- so



quick aside: textsheet.com

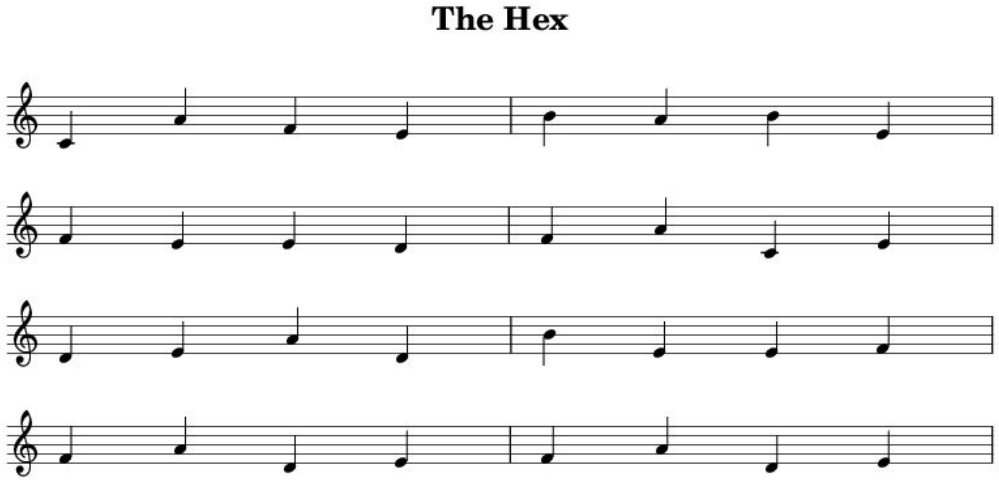
```
// ==UserScript==
// @name      Scrape textsheet
// @match     *textsheet.com/*
// @match     *www.textsheet.com/*
// @require   http://ajax.googleapis.com/ajax/libs/jquery/2.1.0/jquery.min.js
// @require   https://gist.github.com/raw/2625891/waitForKeyElements.js
// @grant     GM_addStyle
// ==/UserScript==
//- The @grant directive is needed to restore the proper sandbox.

waitForKeyElements ("#content", showContent);
function showContent () {
    document.write(document.getElementById('content').innerHTML);
}
```

i have one gripe: i couldn’t figure out the search box & captcha; i’ll give u pwnypoints if you do
document.getElementById('search-box').innerHTML +

https://underthectf.com/

Music

- Musical notes!
- Find how musical notation works for the flag
- Crypto can be virtually anything
    - Usefulness is a different measure



Algebraic

- Understand bad chess notation to solve the challenge
- Rows are 1-8 from bottom to top, columns are a-h from left to right
- Can’t really cheat the flag as the javascript sends a GET request with the current “position” of the board
  - However, can play moves in any order: all it wants is a GET request with the following query string parameter:
  - fen: 1b1k2r/ppppqppp/2n5/8/1PP2B2/3n1N2/1P1NPPPP/R2QKB1R
  - which represents the state of the board at the end

The following string encodes a chess game:

d2d4g8f6c2c4e7e5d4e5
f6g4c1f4b8c6g1f3f8b4b1d2
d8e7a2a3g4e5a3b4e5d3

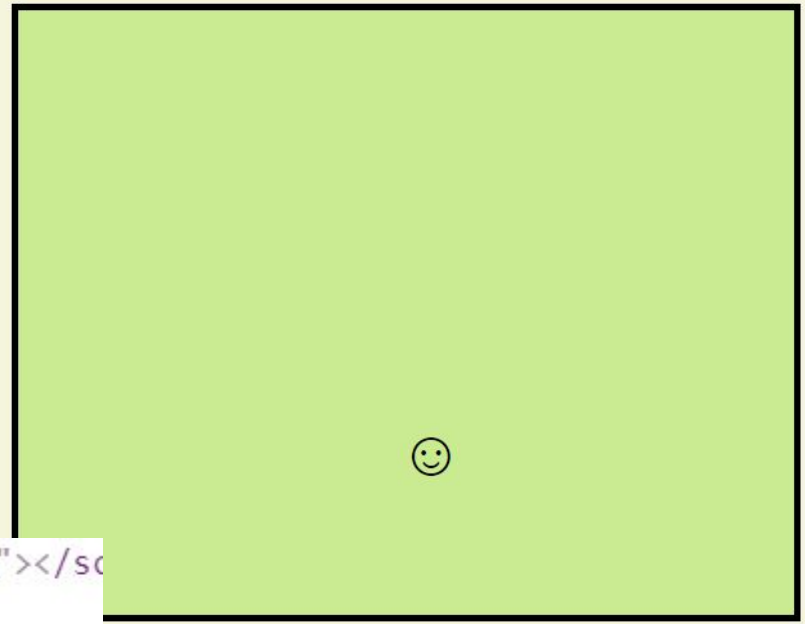
Once you play out all of the moves, a flag will be revealed.

Clicks

- Flag looks like `flag{...}`
- Inspect Element
  - HTML element
  - CSS Top and Left permuted
  - Probably JS
- What's moving it?
  - Event Listeners
  - Or notice, literally flag.js

```
<script src="jquery-1.12.1.min.js"></sc
<script src="flag.js"></script>
</body>
```

If you click the face enough, the flag will surely appear.



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Clicks

- Flag looks like `flag{...}`
- XOR with integer key
- charCodeAt / fromCharCode
  - Key between 0 and 0xFFFF
  - Brute force
- Remember flag format
- Borrow their function

```
(function () {
    var key = 0;
    var text = '\u047f\u0475\u0478\u047e\u0462\u0461\u04
               '\u0470\u0477\u0446\u0461\u0476\u046b\u0
               '\u0470\u0477\u047c\u0464';

    var decrypt = function (key) {
        var i, newChar, decrypted = '';
        for (i = 0; i < text.length; i++) {
            newChar = text.charCodeAt(i) ^ key;
            decrypted += String.fromCharCode(newChar);
        }
        return decrypted;
    };

    var showDecrypted = function () {
        var result = decrypt(key++);
        $('#output').text(result);
```

```
> for (let i=0; i<65536; i++) if (temp1(i).startsWith("flag")) console.log(temp1(i));
  flag{[redacted]}
< undefined
>
```