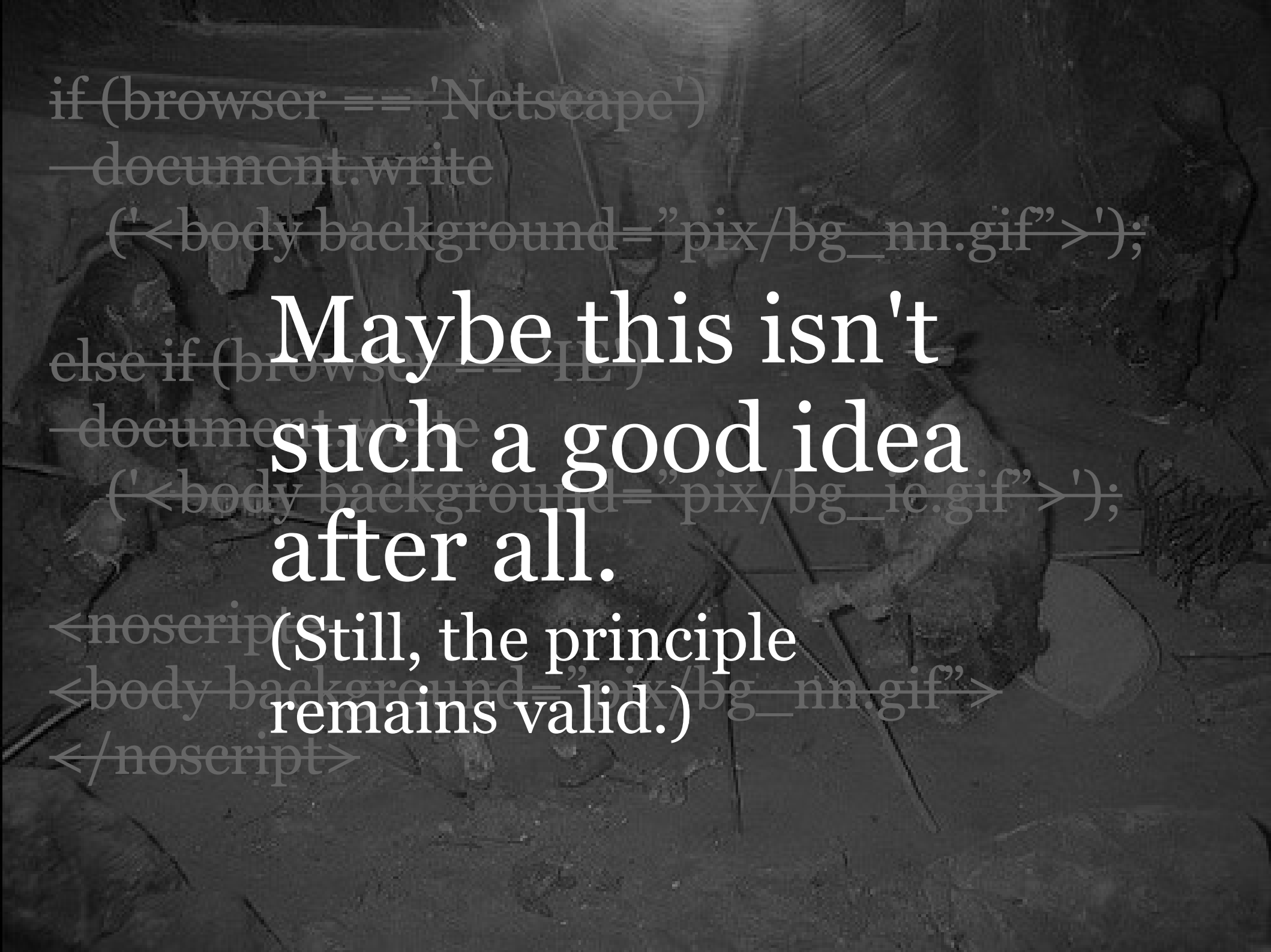
Advanced Design Techniques: JavaScript to the Rescue

Peter-Paul Koch (ppk)
http://www.quirksmode.org
VTM Conference, Oct. 24th, 2007


1998

```
if (browser == 'Netscape')
   document.write
    ('<body background=”pix/bg_nn.gif”>');

else if (browser == 'IE')
  document.write
    ('<body background=”pix/bg_ie.gif”>');

<noscript>
<body background=”pix/bg_nn.gif”>
</noscript>
```


if (browser == 'Netscape')
document.write
('<body background="pix/bg_nn.gif">');
else if (browser == 'IE')
document.write
('<body background="pix/bg_ie.gif">');
<noscript>
<body background="pix/bg_nn.gif">
</noscript>
Maybe this isn't such a good idea after all.
(Still, the principle remains valid.)


Fast forward to 2007


Using JavaScript
responsibly
to plug a few holes
in browsers' CSS
support


Zebra Lists

```
li:nth-child(even) {
  background-color: #00cc00;
}
```

Opera: Yes
IE: No
Firefox: No
Safari: No

```
<ul id=”navigation”>
   <li><a href=”#”>My books</a></li>
   <li><a href=”#”>Other books</a></li>
</ul>

<p>Titles</p>
<ul>
   <li>PPK on JavaScript</li>
   <li>Designing with Web Standards<li>
   <li>Bulletproof Web Design</li>
</ul>
```

```
<ul id=”navigation”>
   <li><a href=”#”>My books</a></li>
   <li><a href=”#”>Other books</a></li>
</ul>

<p>Titles</p>
<ul class=”zebra”>
   <li>PPK on JavaScript</li>
   <li>Designing with Web Standards<li>
   <li>Bulletproof Web Design</li>
</ul>
```

Rule #1
Use hooks to indicate which HTML elements should be affected.

Typical hooks:

- id
- class

```
var lists = getElementsByTagNames('ol,ul');
for (var i=0,list;list=lists[i];i++) {
    if (list.className != 'zebra') continue;
    var lis = list.getElementsByTagName('li');
    for (var j=0;j<lis.length;j+=2) {
        lis[j].style.backgroundColor = '#00cc00';
    }
}
```

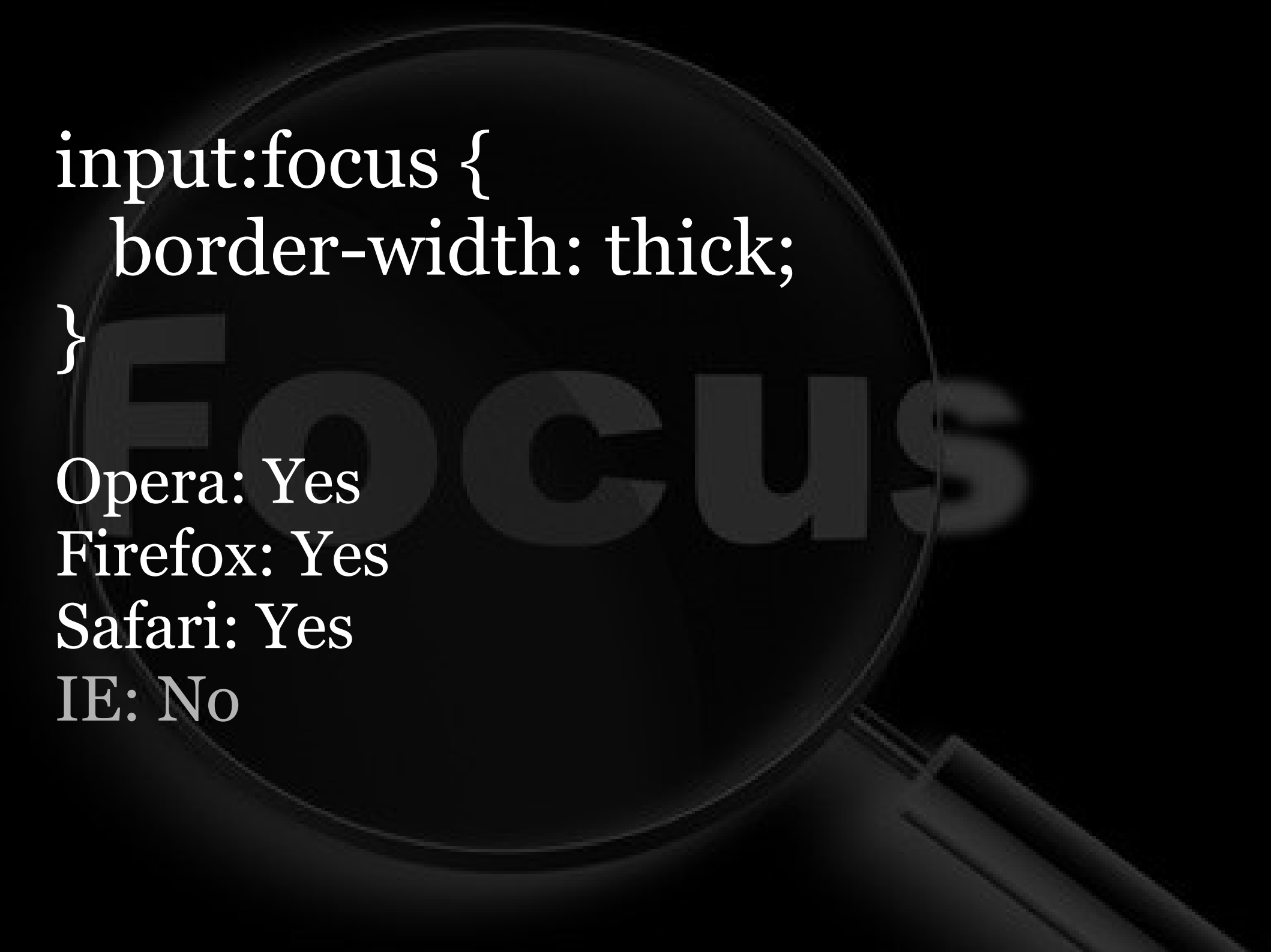
What if JavaScript is not supported?

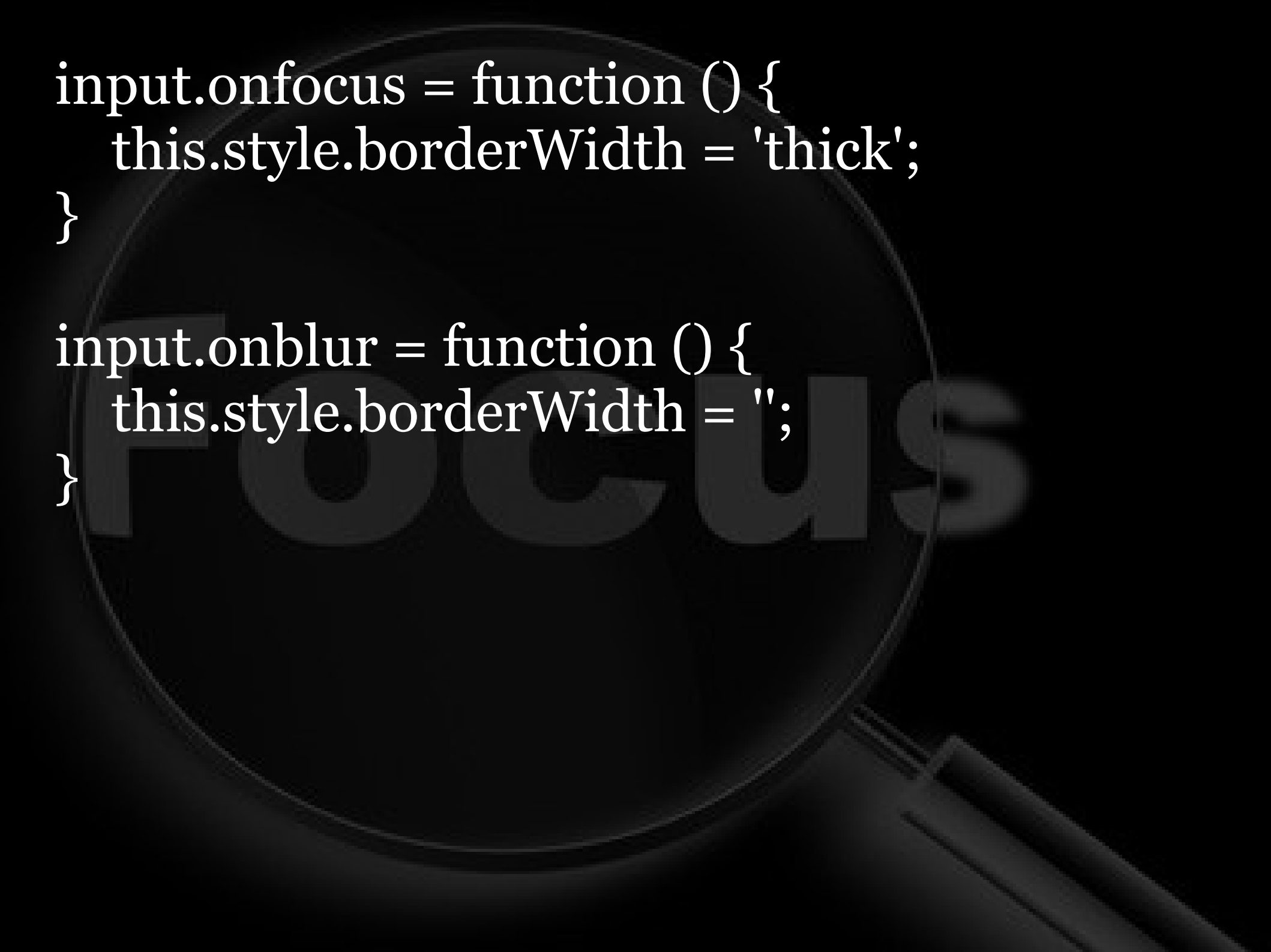
Users won't see the zebra list
but they don't know it's supposed to be there,
and the effect is not vital, anyway.

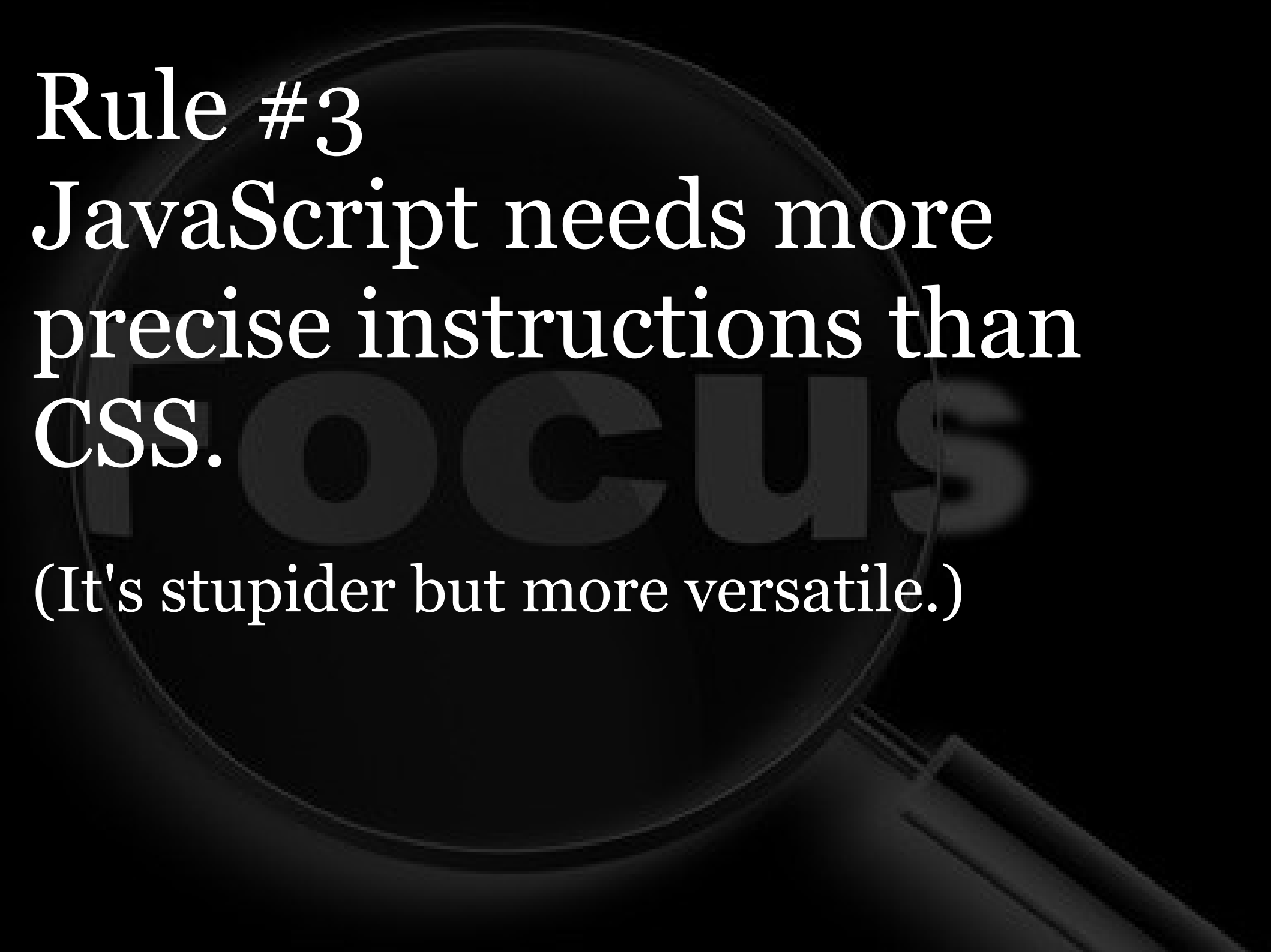
Rule #2
If JavaScript is not supported, usability suffers.

(Can't be helped.)
(Sorry.)


:focus


input:focus {
border-width: thick;
}
Focus
Opera: Yes
Firefox: Yes
Safari: Yes
IE: No

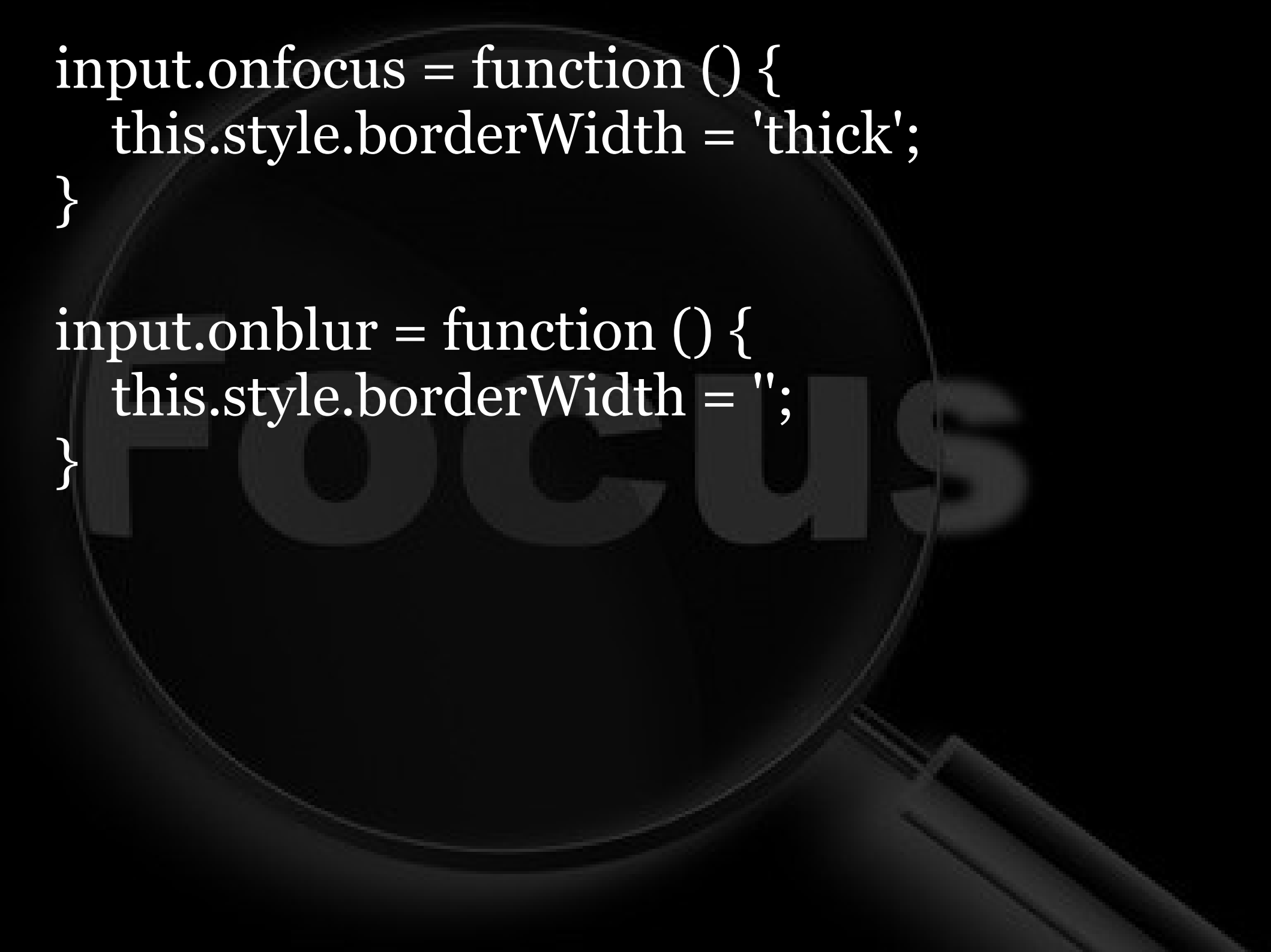

input.onfocus = function () {
this.style.borderWidth = 'thick';
}
input.onblur = function () {
this.style.borderWidth = '';
}
Focus



Rule #3
JavaScript needs more precise instructions than CSS.

(It's stupider but more versatile.)

```
input.onfocus = function () {
    this.style.borderWidth = 'thick';
}

input.onblur = function () {
    this.style.borderWidth = '';
}
```



```
input.onfocus = function () {
    this.style.borderWidth = 'thick';
    this.className += ' focused';
}

input.onblur = function () {
    this.style.borderWidth = '';
    this.className =
        this.className.replace(/focused/g,'');
}

.focused {
    border-width: thick;
}
```

Rule #4
Add class names; do not change styles.

(Ease of maintenance)
Adding class names keeps all CSS classes intact.

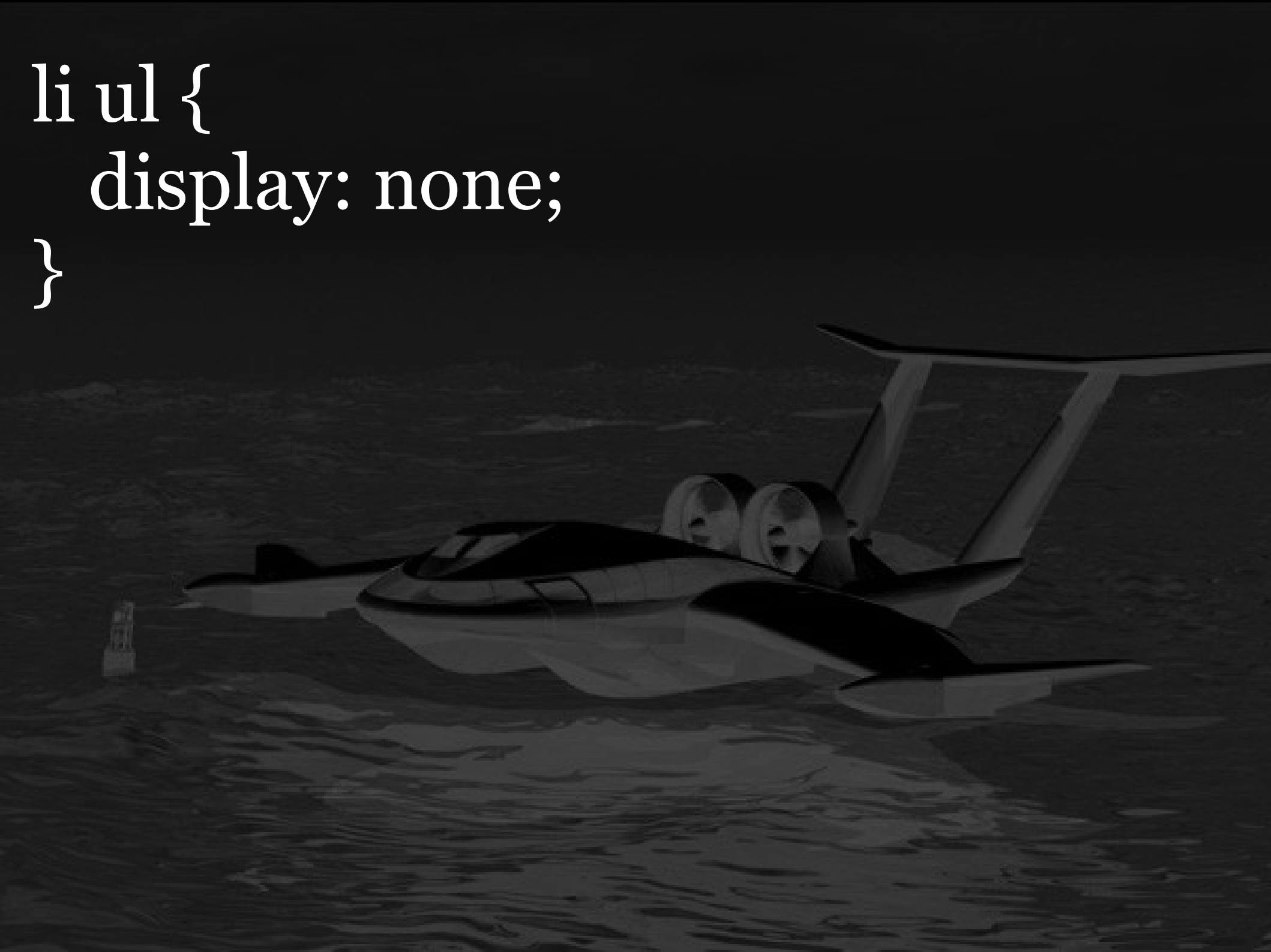
```
var lists = getElementsByTagNames('ol,ul');
for (var i=0,list;list=lists[i];i++) {
    if (list.className != 'zebra') continue;
    var lis = list.getElementsByTagName('li');
    for (var j=0;j<lis.length;j+=2) {
        lis[j].style.backgroundColor = '#00cc00';
    }
}
```

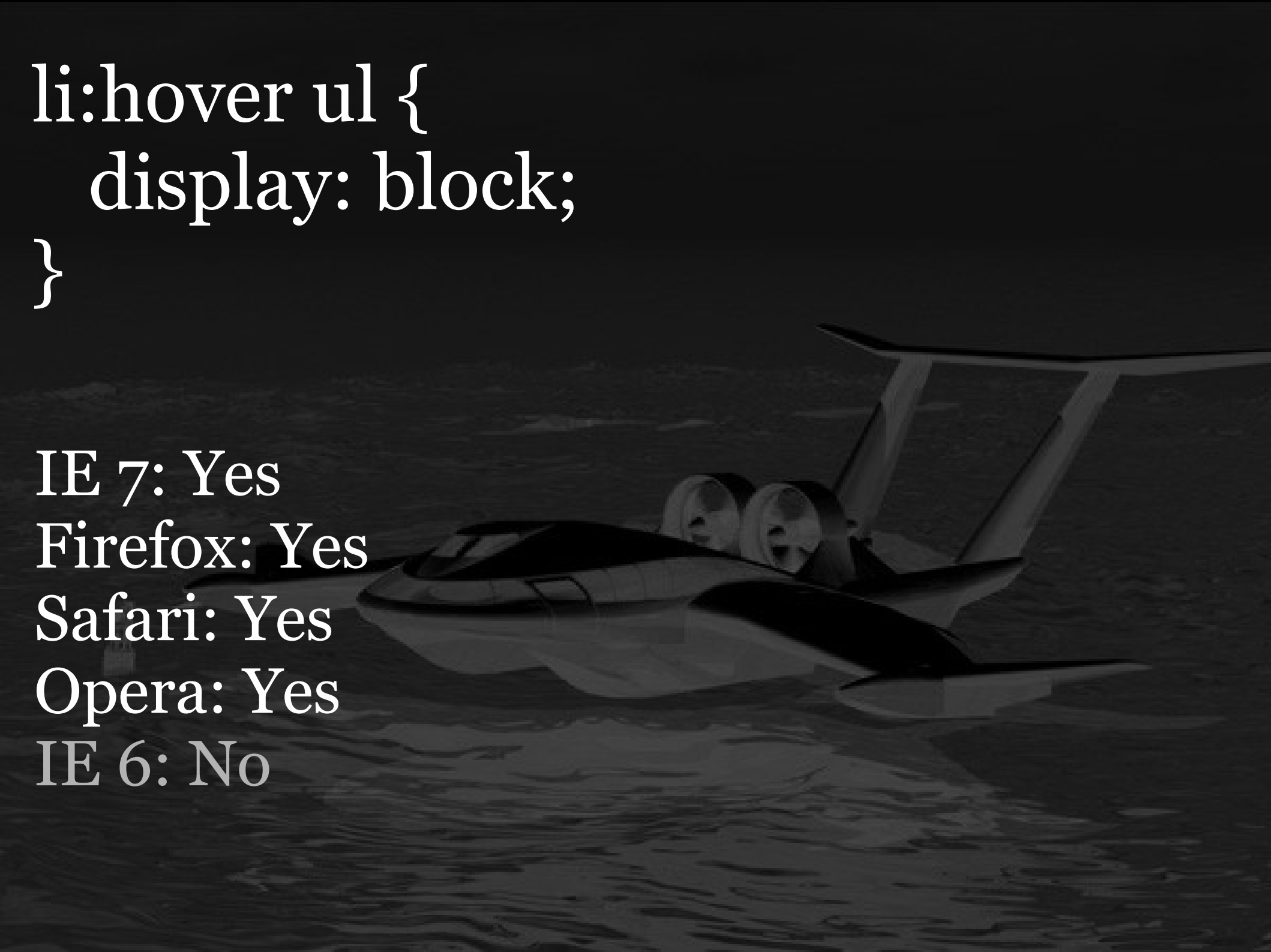
```
var lists = getElementsByTagNames('ol,ul');
for (var i=0,list;list=lists[i];i++) {
    if (list.className != 'zebra') continue;
    var lis = list.getElementsByTagName('li');
    for (var j=0;j<lis.length;j+=2) {
        lis[j].style.backgroundColor = '#00cc00';
        lis[j].className = 'even';
    }
}
```


:hover

```
<ul id=”navigation”>
   <li><a href=”#”>Multimedialize</a><li>
   <li><a href=”#”>Ajaxify</a>
      <ul>
         <li><a href=”#”>Web 1.0</a></li>
         <li><a href=”#”>Web 2.0</a></li>
         <li><a href=”#”>Web 3.0</a></li>
      </ul></li>
</ul>
```

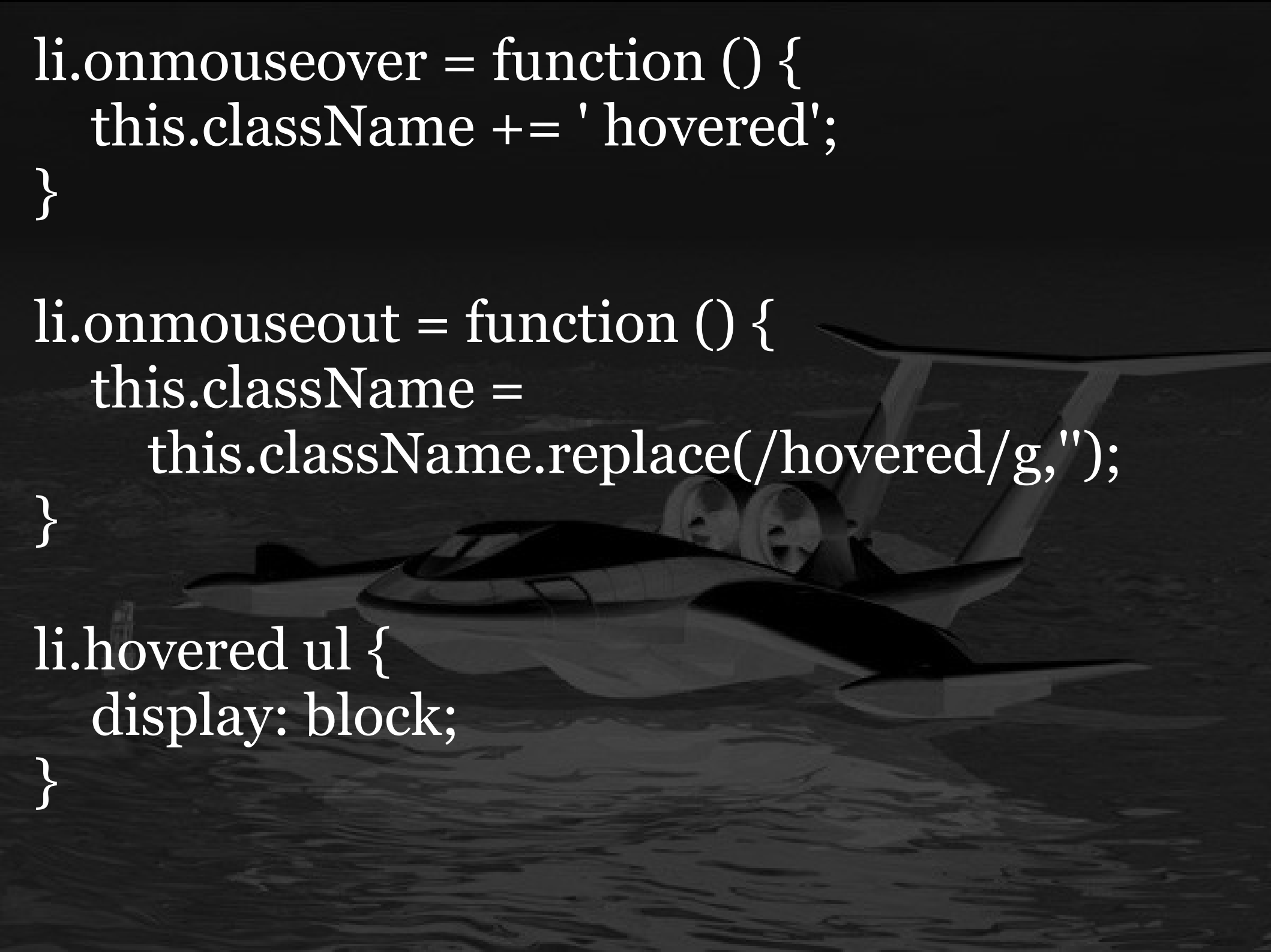
```
li ul {
   display: none;
}
```



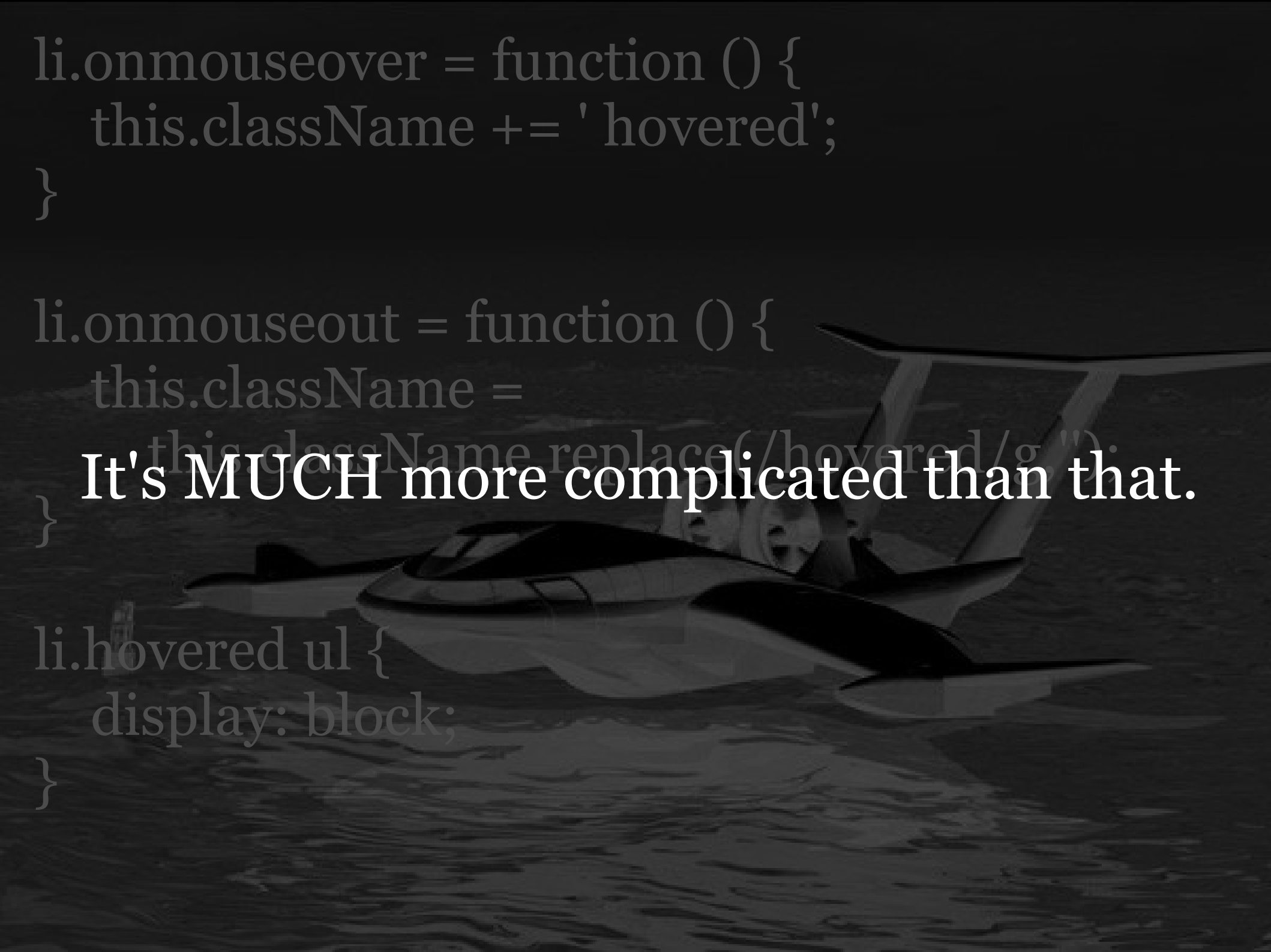


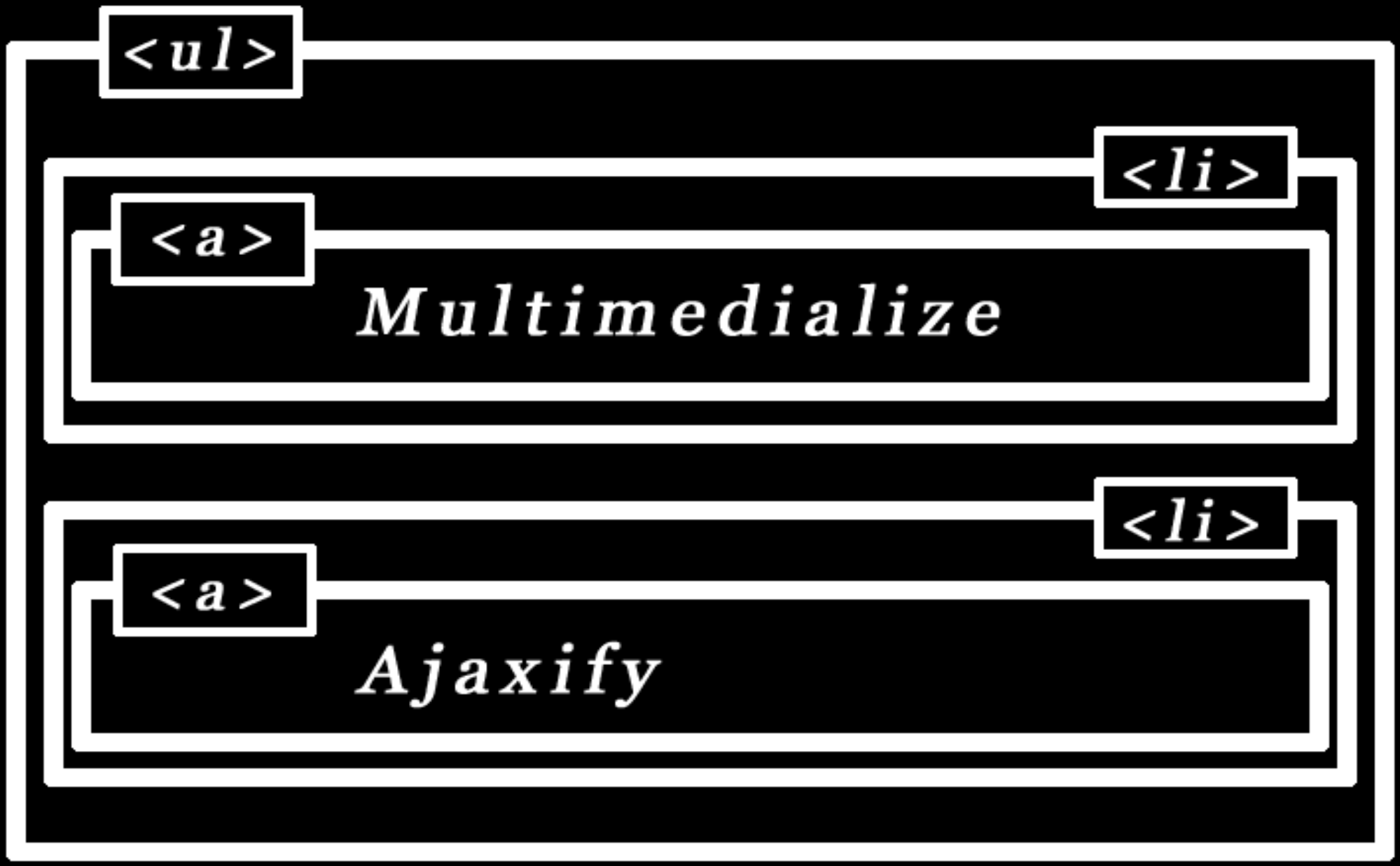
```
li:hover ul {
   display: block;
}
```

IE 7: Yes
Firefox: Yes
Safari: Yes
Opera: Yes
IE 6: No



```
li.onmouseover = function () {
    this.className += ' hovered';
}

li.onmouseout = function () {
    this.className =
        this.className.replace(/hovered/g,'');
}

li.hovered ul {
    display: block;
}
```


li.onmouseover = function () {
this.className += ' hovered';
}
li.onmouseout = function () {
this.className =
this.className.replace(/hovered/g, '');
}
li.hovered ul {
display: block;
}
It's MUCH more complicated than that.

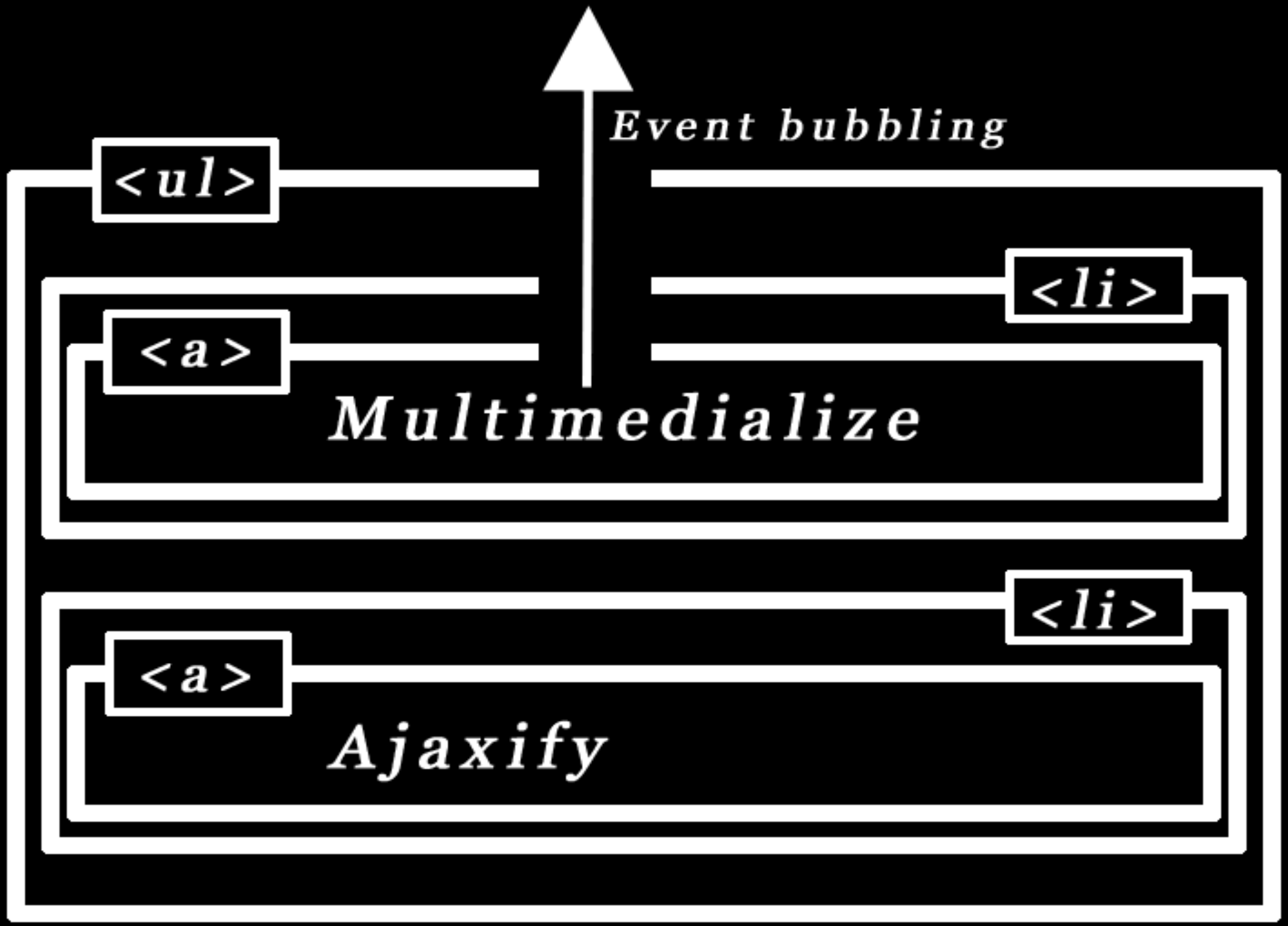


<a>
Multimedialize

<a>
Ajaxify

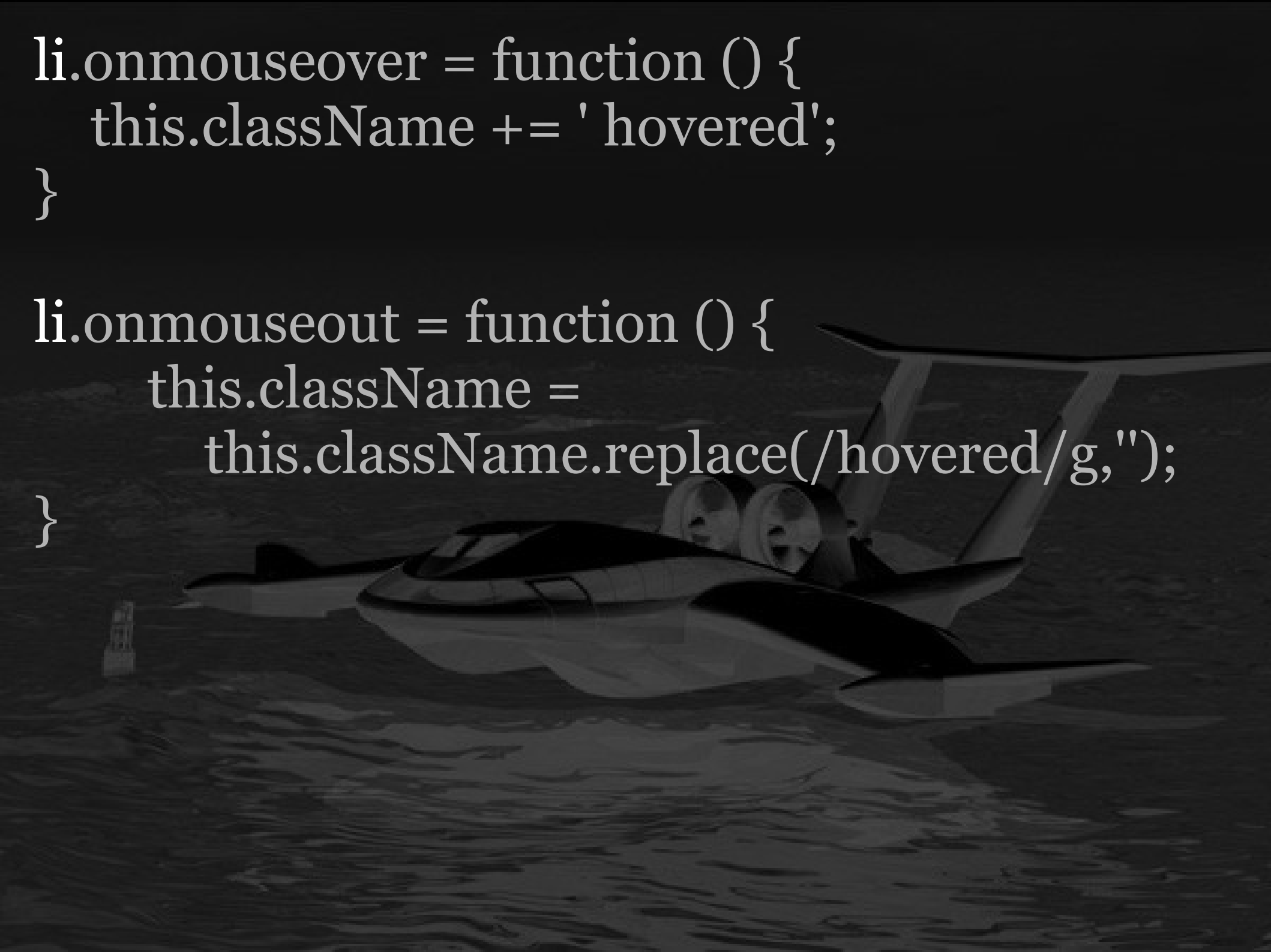
Event bubbling

Mouse events only!


Event bubbling

<a>
Multimedialize

<a>
Ajaxify



```
li.onmouseover = function () {
    this.className += ' hovered';
}

li.onmouseout = function () {
        this.className =
            this.className.replace(/hovered/g,'');
}
```

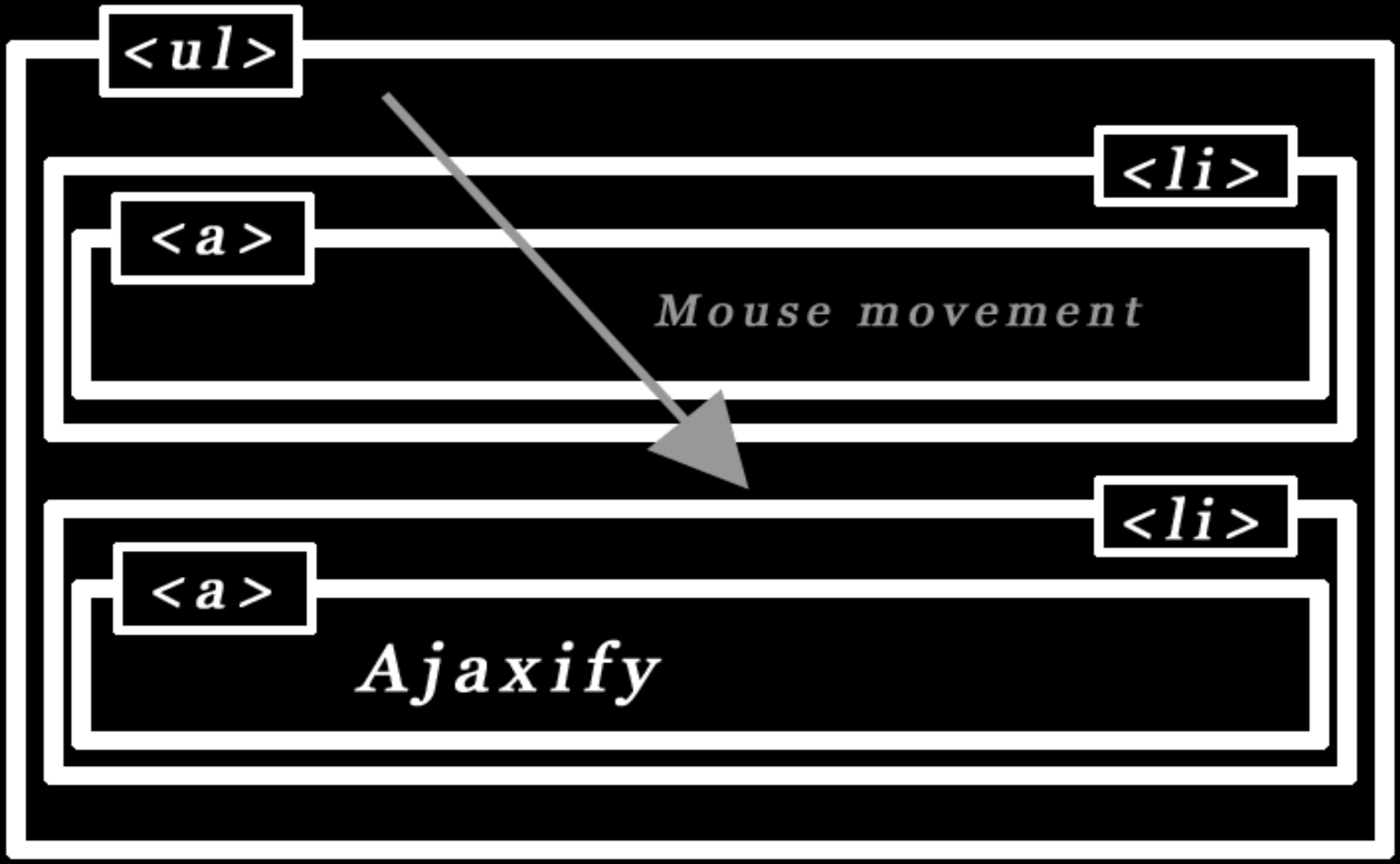
```
ul.onmouseover = function () {
    var li = [find correct li];
    li.className += ' hovered';
}

ul.onmouseout = function () {
    var li = [find correct li];
        li.className =
            li.className.replace(/hovered/g,'');
}
```

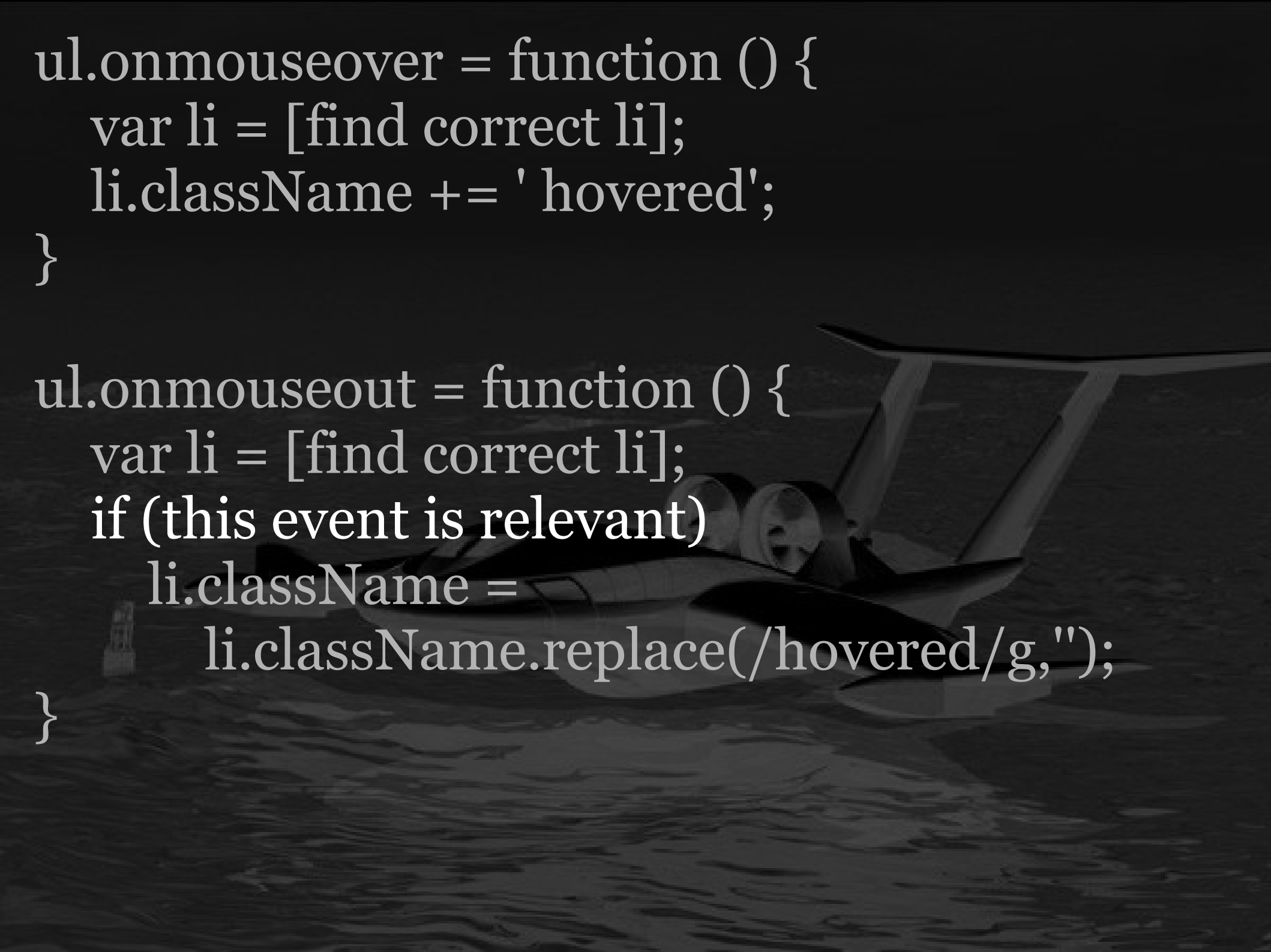
Event delegation

Event bubbling

The down side

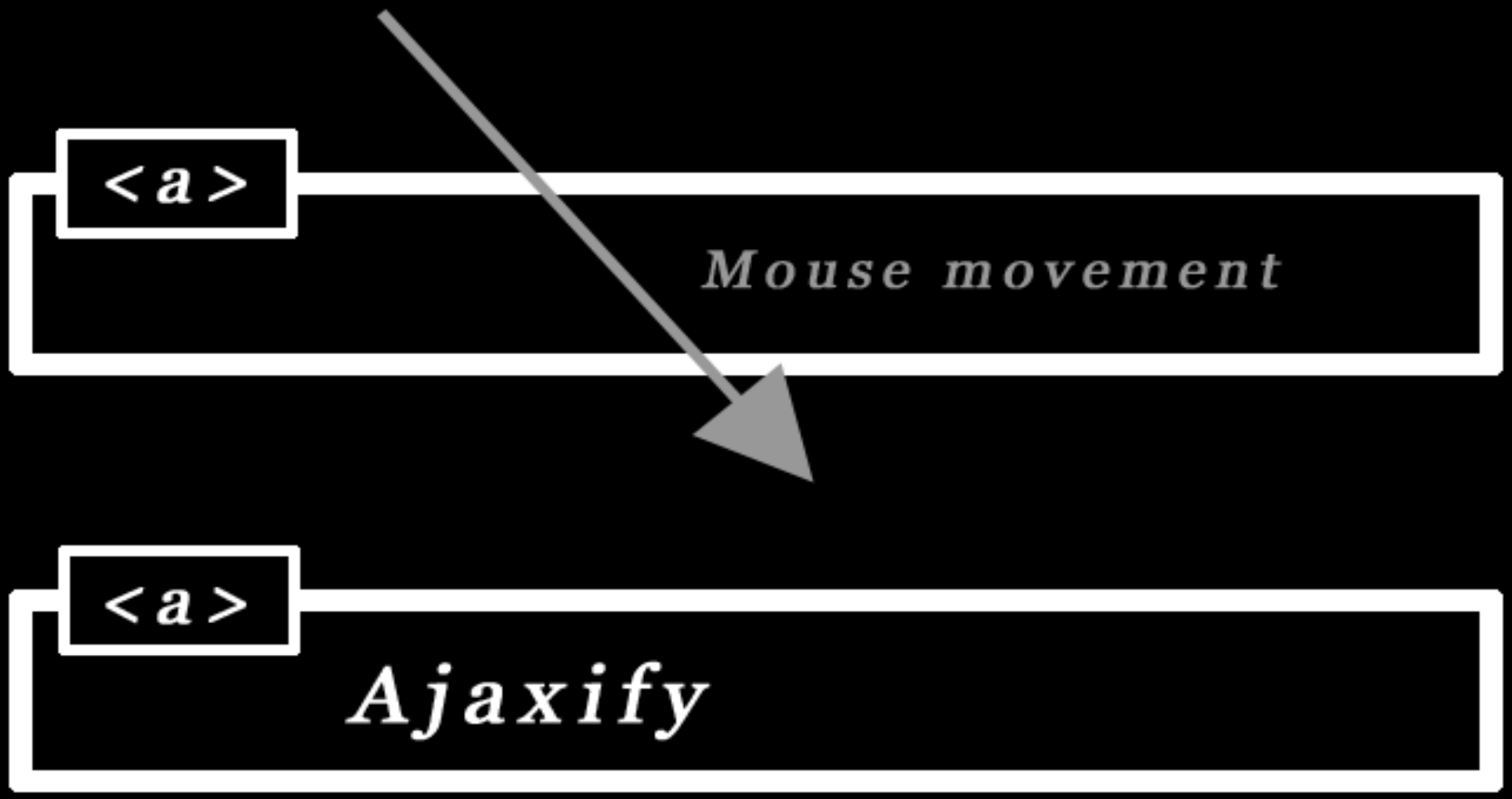
li.mouseover, li.mouseout, a.mouseover,
a.mouseout, li.mouseover, li.mouseout

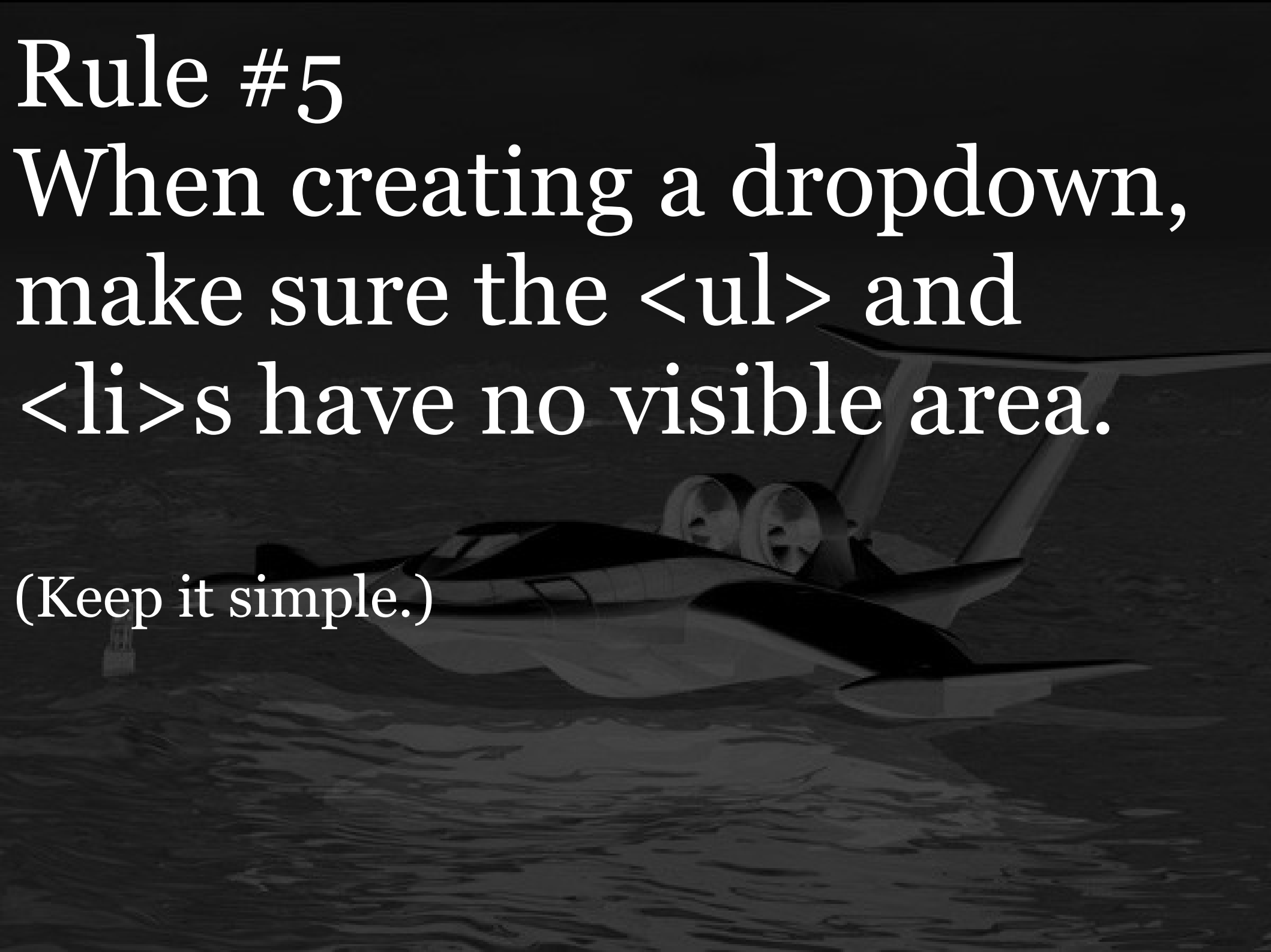




```
ul.onmouseover = function () {
    var li = [find correct li];
    li.className += ' hovered';
}

ul.onmouseout = function () {
    var li = [find correct li];
    if (this event is relevant)
        li.className =
            li.className.replace(/hovered/g,'');
}
```

a.onmouseover, a.onmouseout

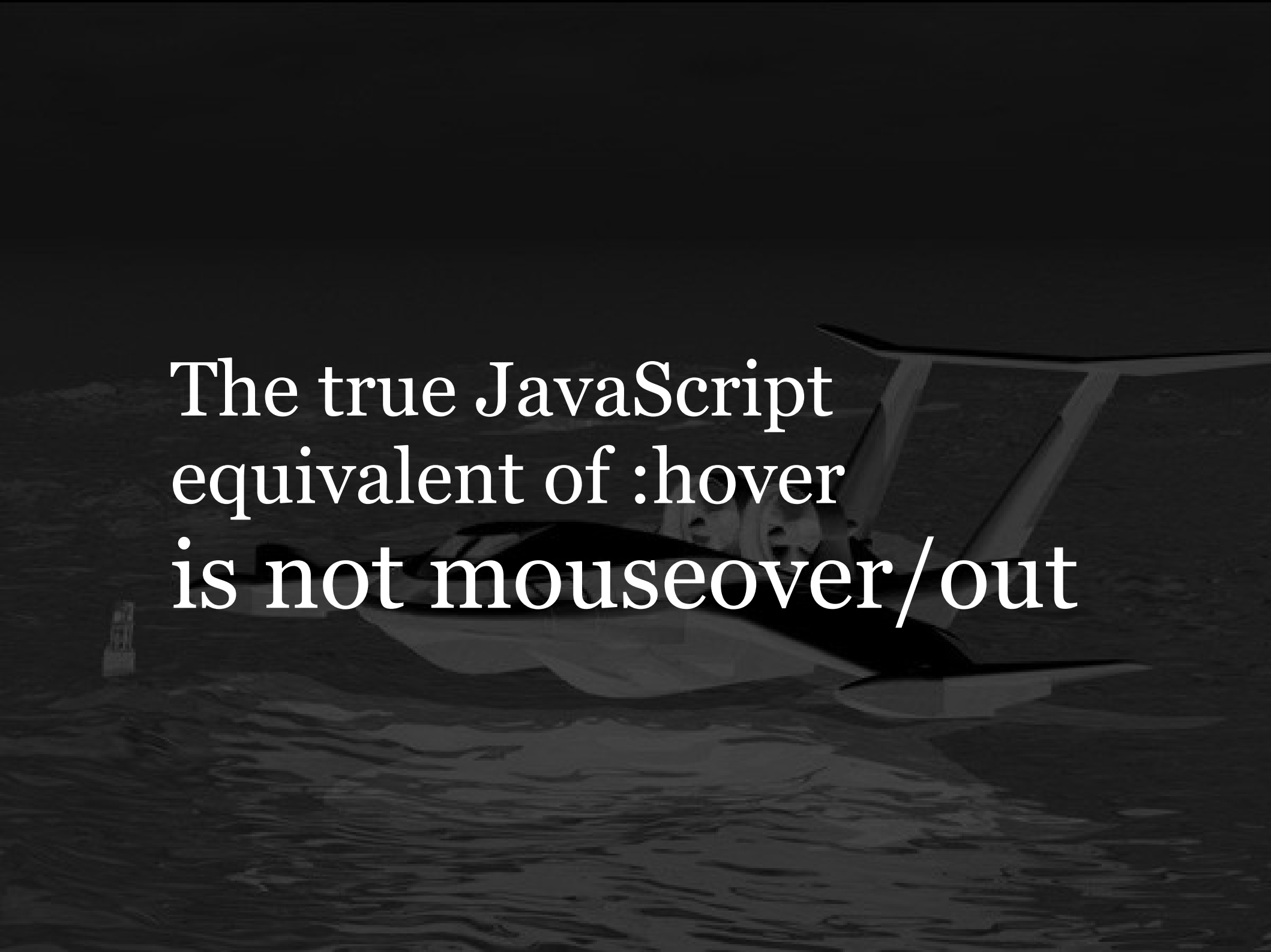


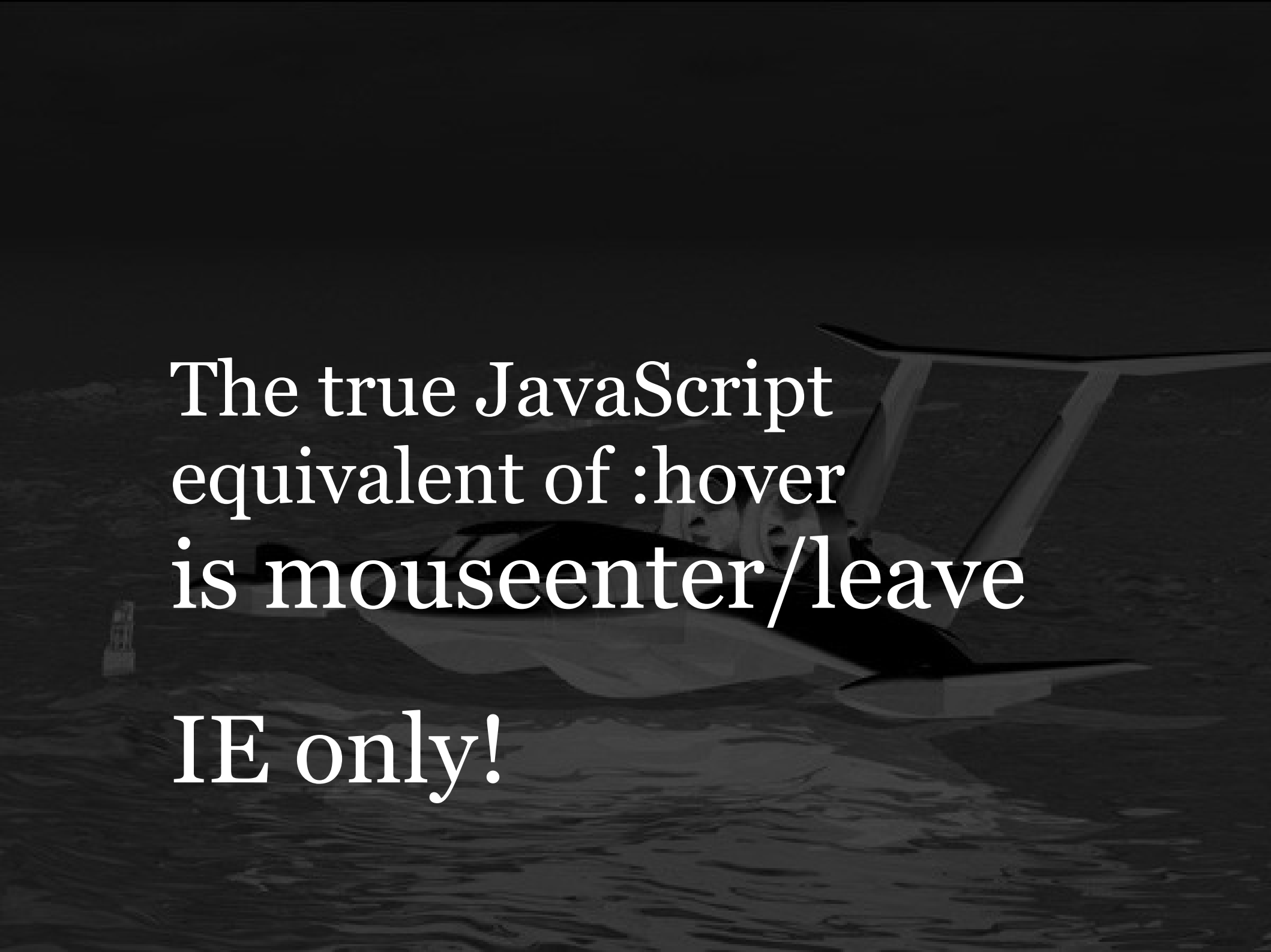


Rule #5

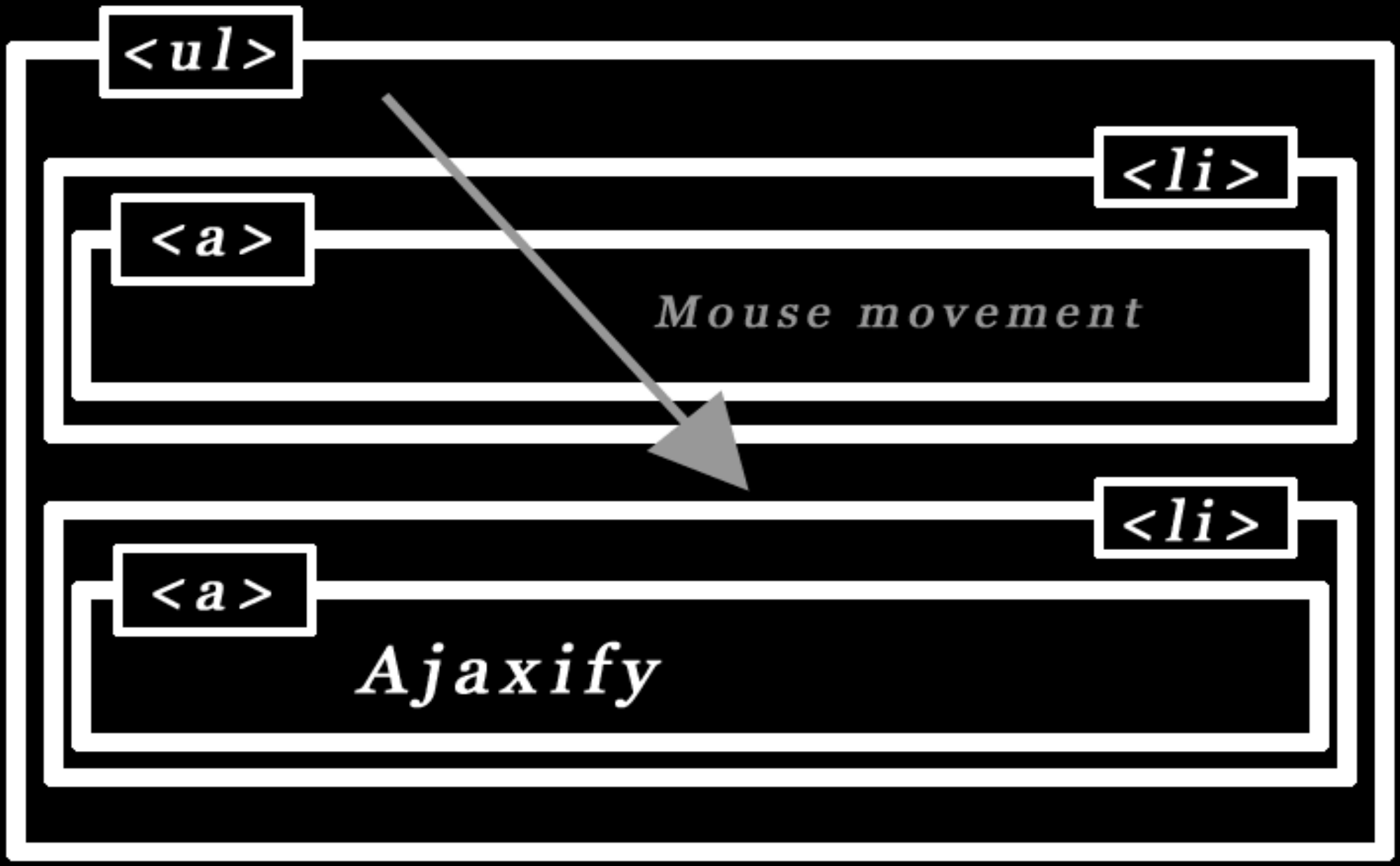
When creating a dropdown, make sure the <ul> and s have no visible area.

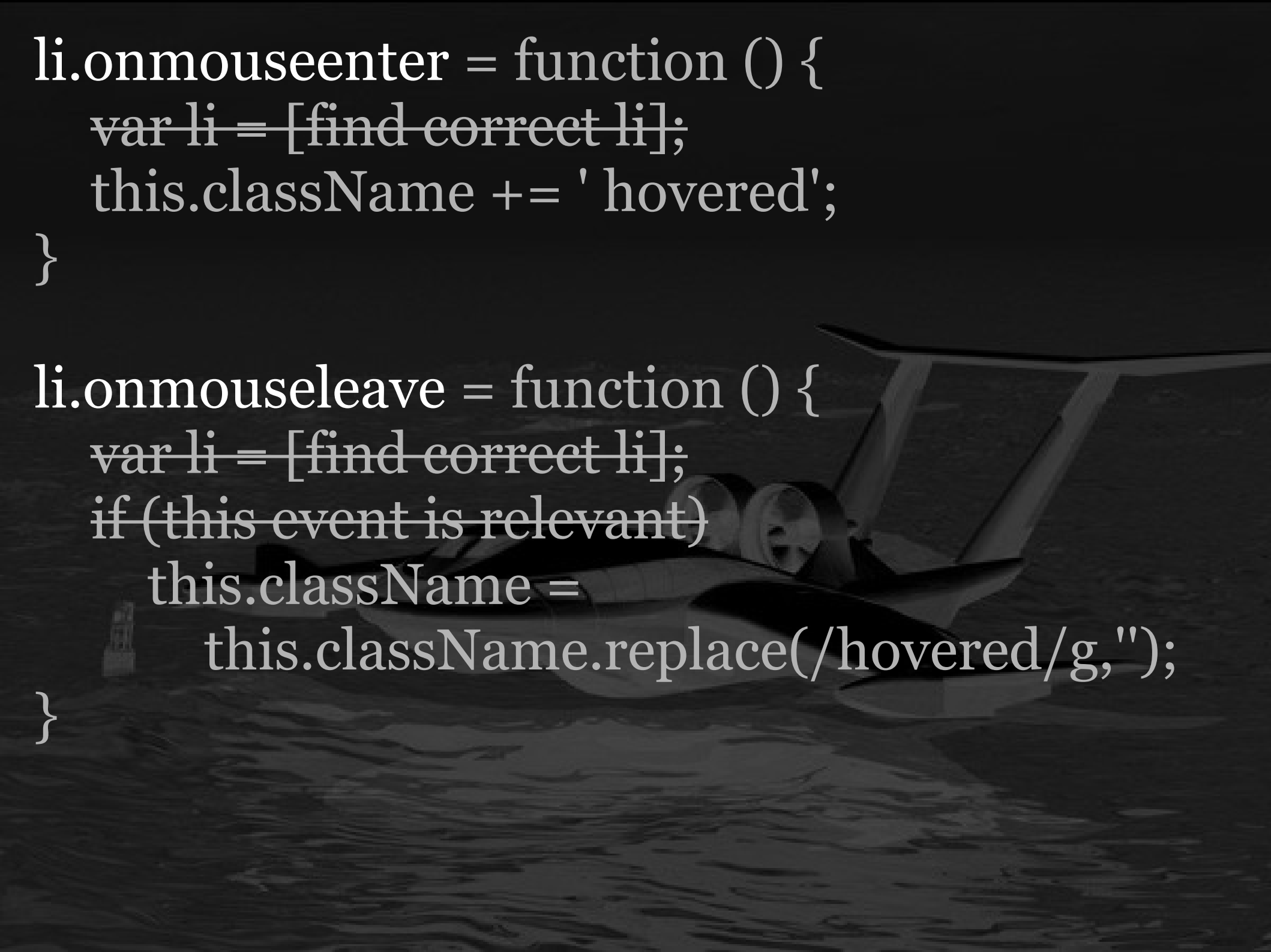
(Keep it simple.)


The true JavaScript
equivalent of :hover
is not mouseover/out


The true JavaScript
equivalent of :hover
is mouseenter/leave
IE only!

li.mouseenter, li.mouseleave



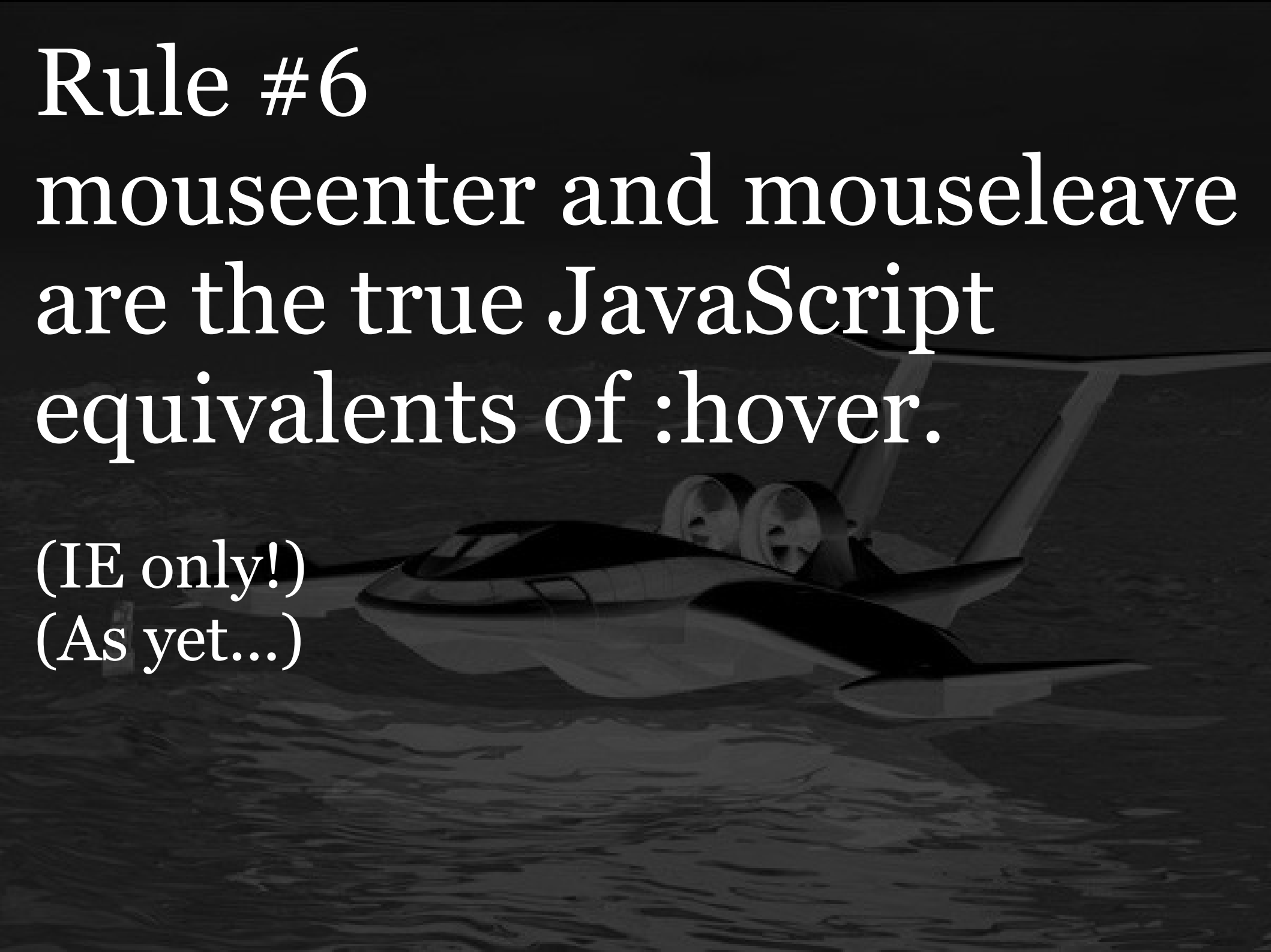


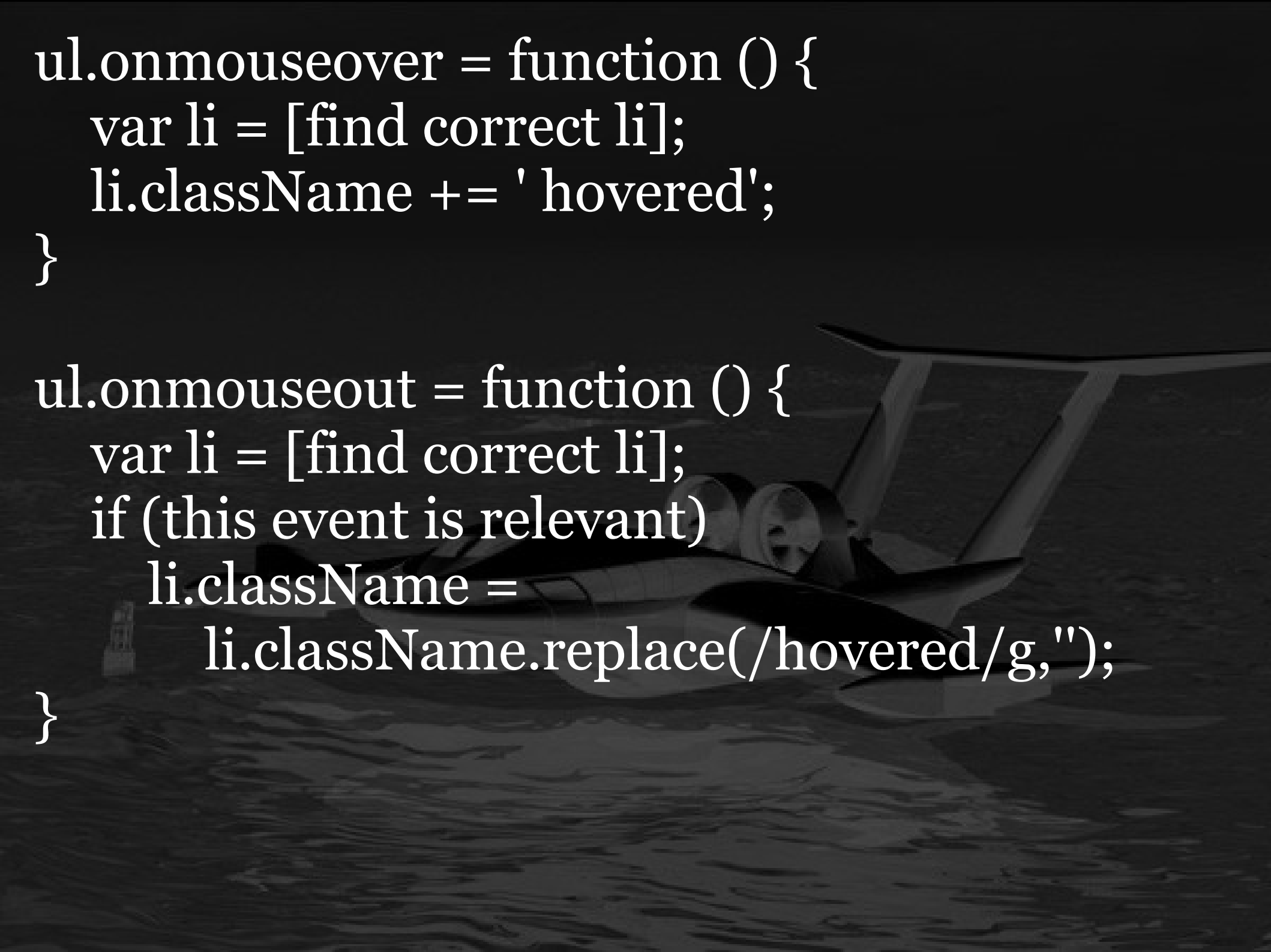
```
li.onmouseenter = function () {
    var li = [find correct li];
    this.className += ' hovered';
}

li.onmouseleave = function () {
    var li = [find correct li];
    if (this event is relevant)
        this.className =
            this.className.replace(/hovered/g,'');
}
```

Rule #6

mouseenter and mouseleave are the true JavaScript equivalents of :hover.

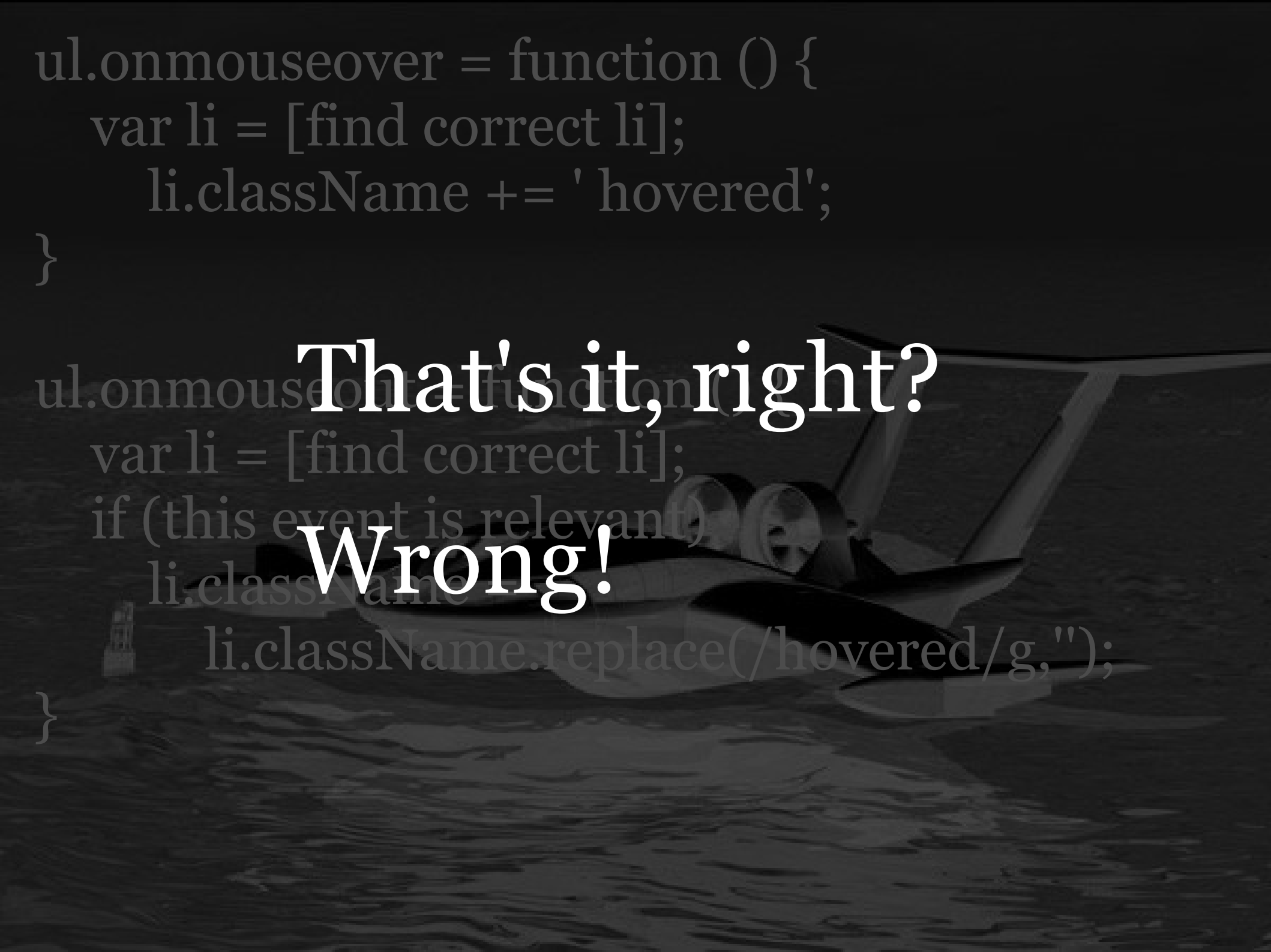
(IE only!)
(As yet...)





```
ul.onmouseover = function () {
    var li = [find correct li];
    li.className += ' hovered';
}

ul.onmouseout = function () {
    var li = [find correct li];
    if (this event is relevant)
        li.className =
            li.className.replace(/hovered/g,'');
}
```

```
ul.onmouseover = function () {
    var li = [find correct li];
        li.className += ' hovered';
}

ul.onmouseout = function () {
    var li = [find correct li];
    if (this event is relevant)
        li.className =
            li.className.replace(/hovered/g,'');
}
```




Device
Independence!

:hover and onmouseover
are mouse only.

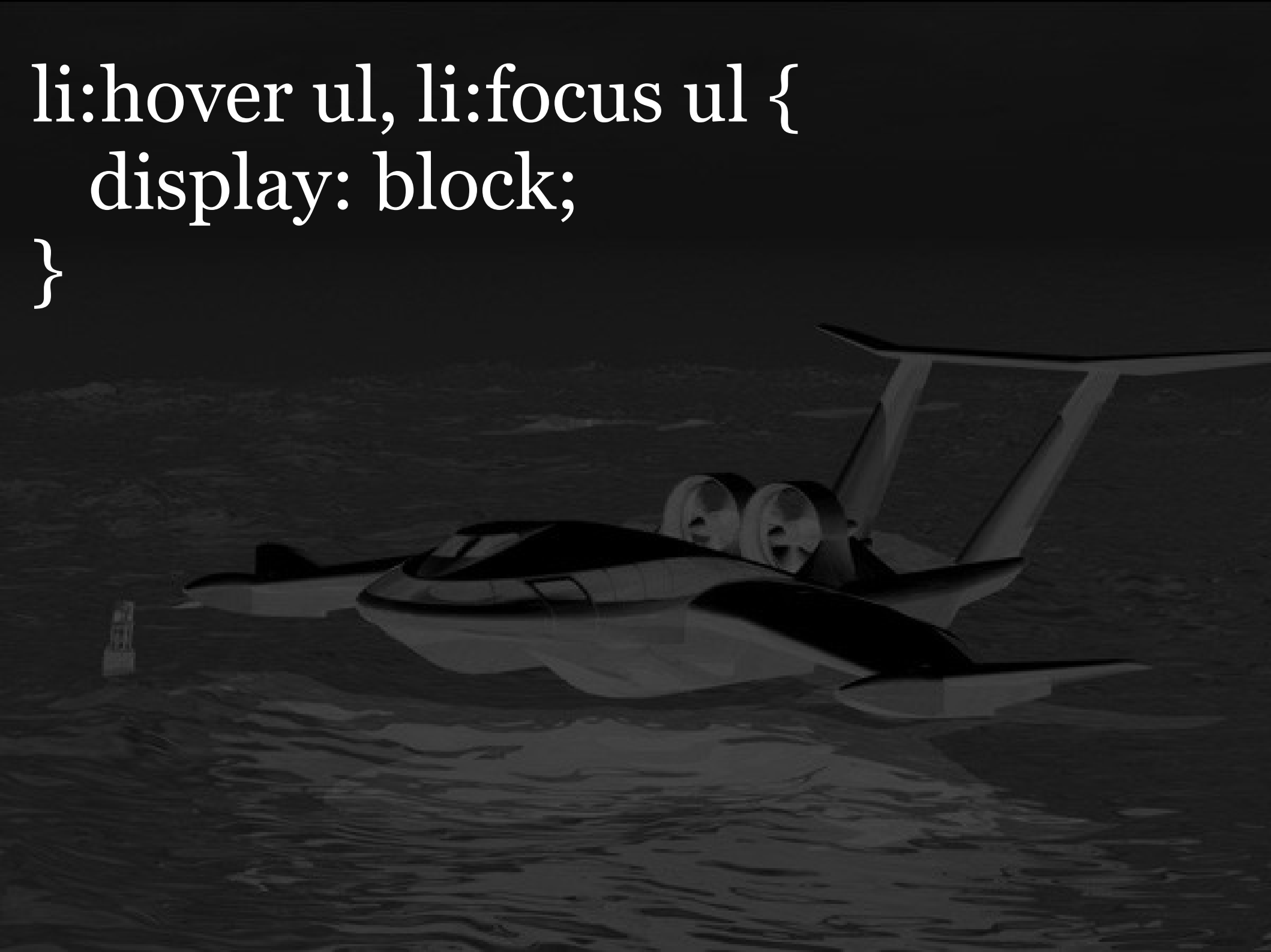
We need a keyboard handler

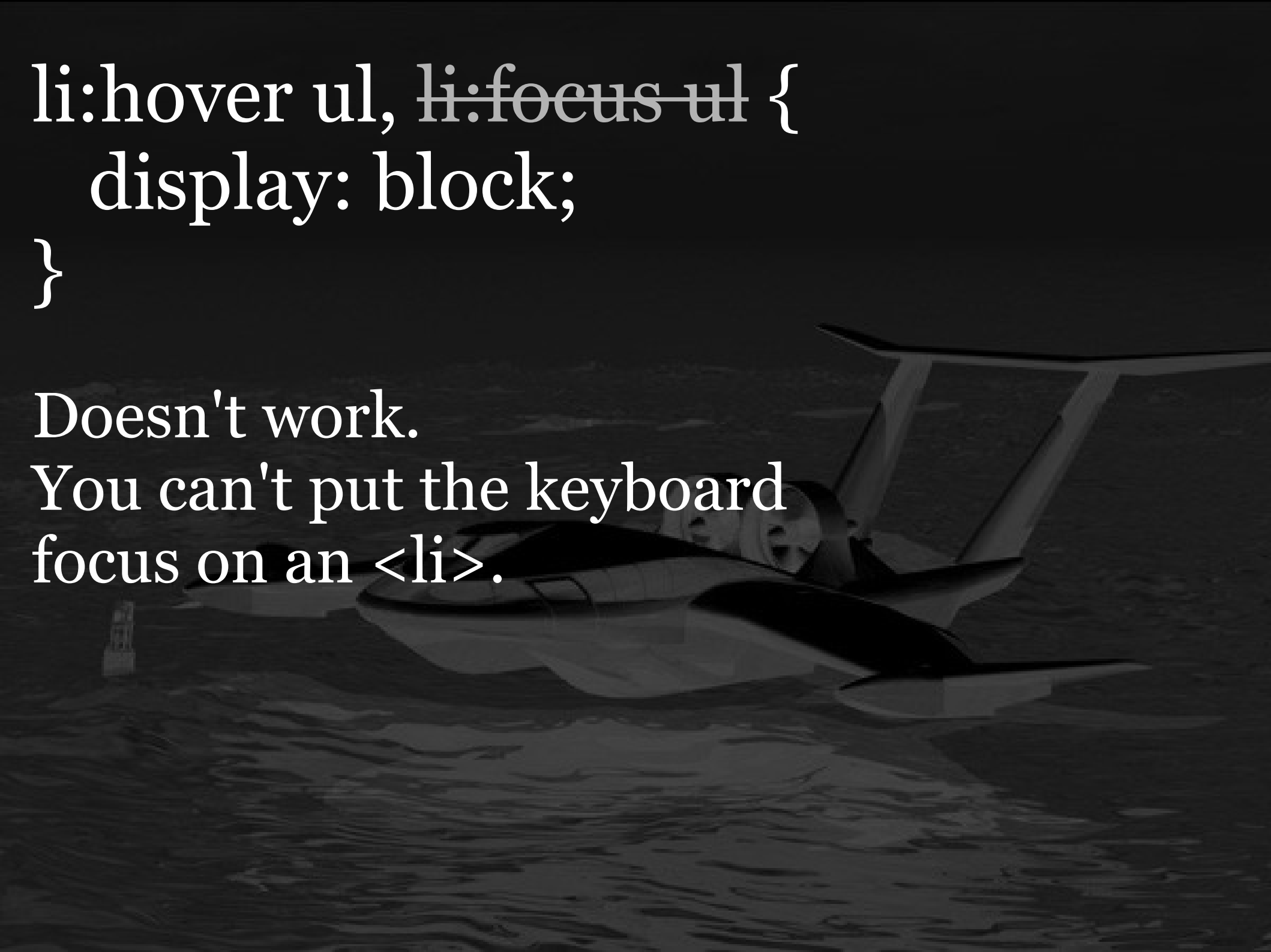
:hover and onmouseover
are mouse only.

We need a keyboard handler

:focus / onfocus

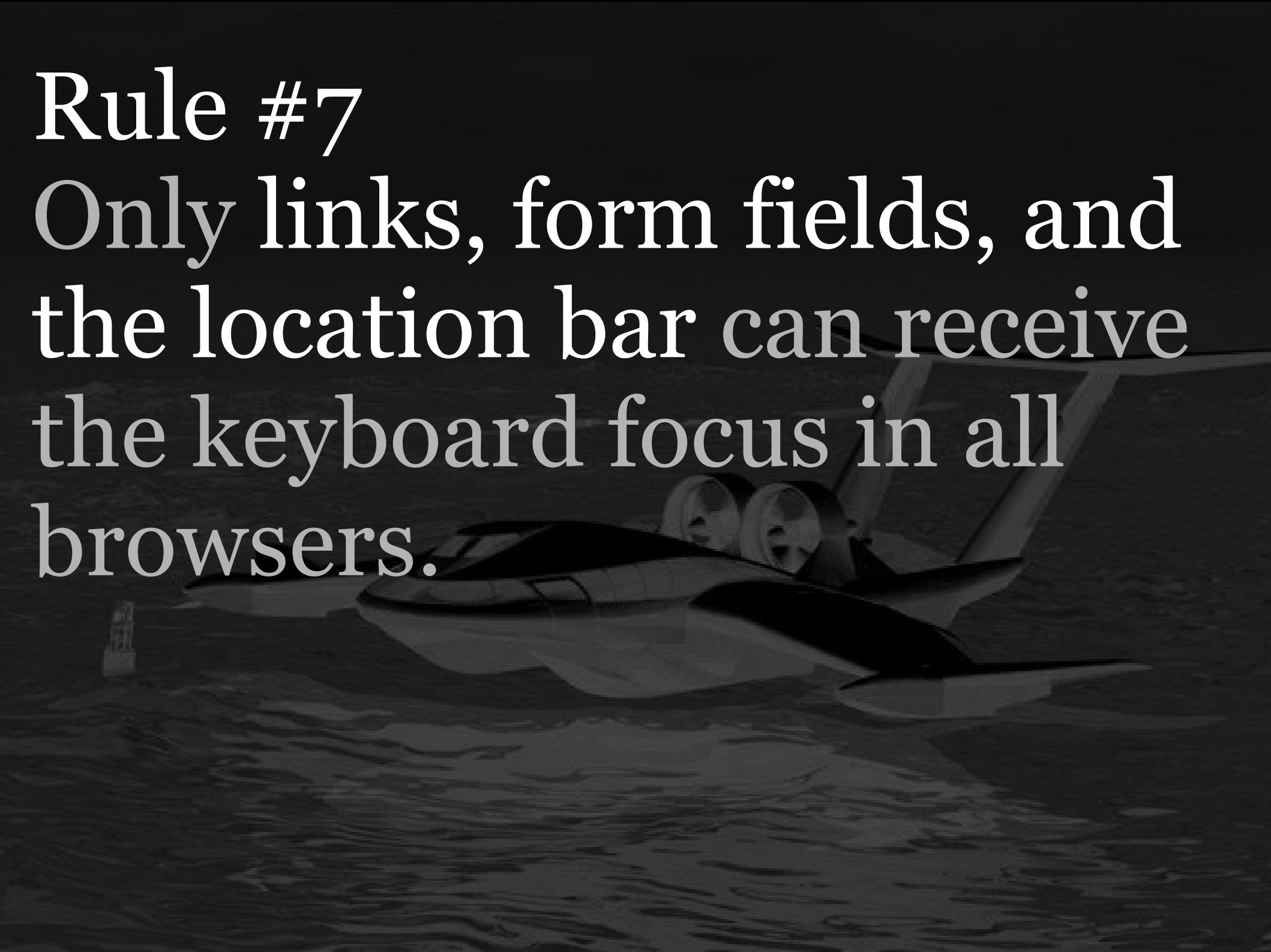
```
li:hover ul, li:focus ul {
    display: block;
}
```





```
li:hover ul, li:focus ul {
    display: block;
}
```

Doesn't work.
You can't put the keyboard focus on an <li>.

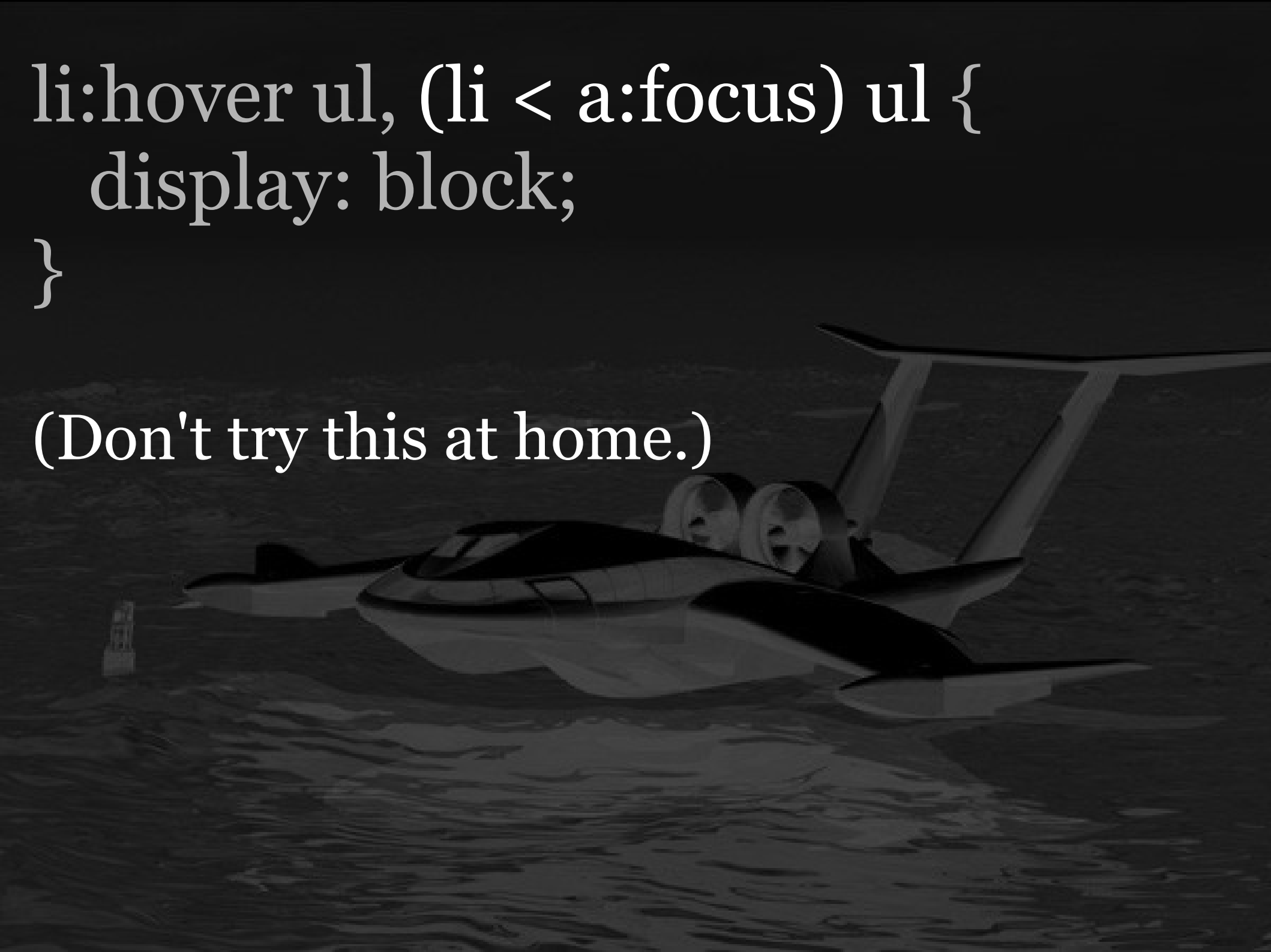


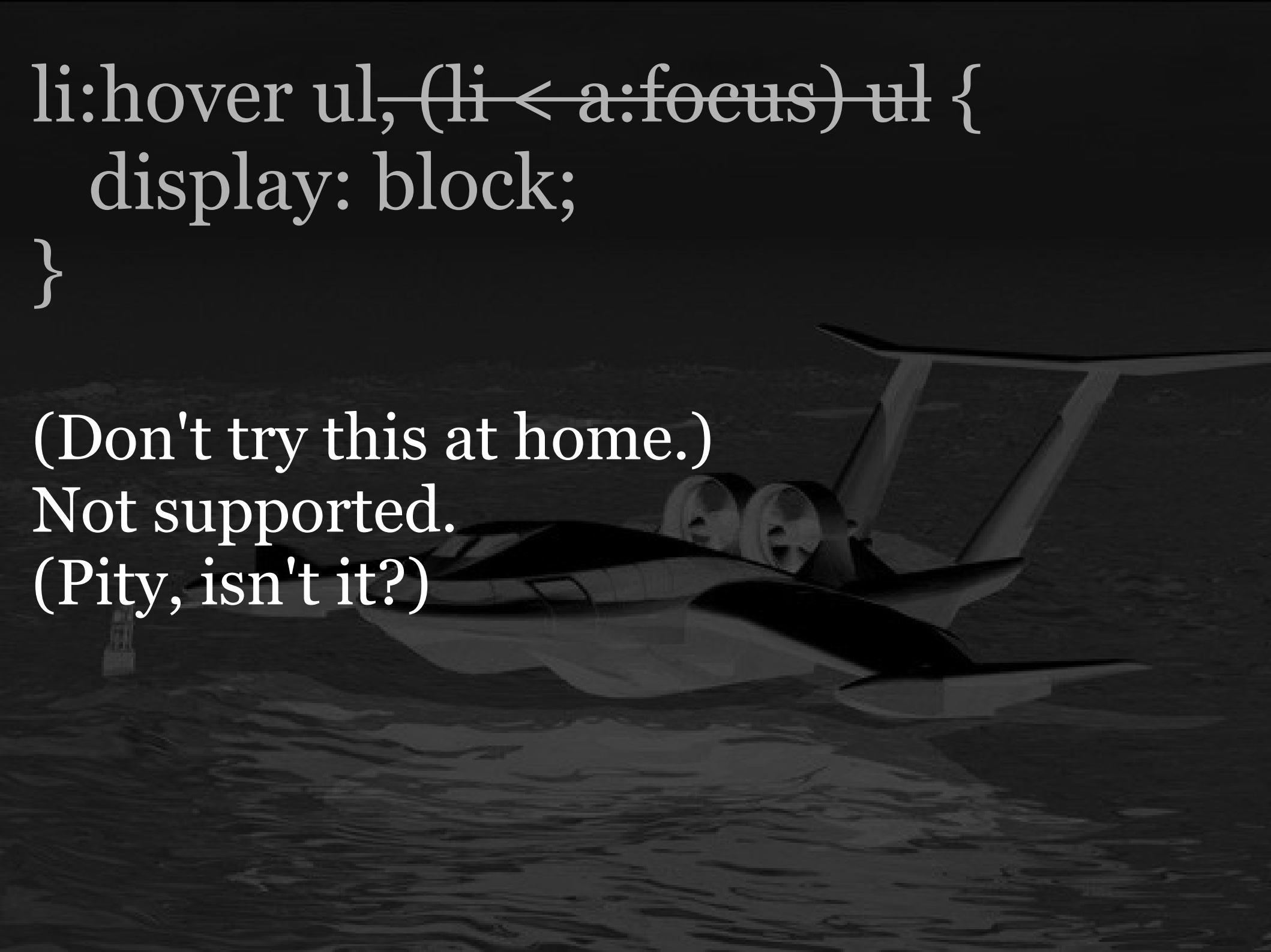
Rule #7

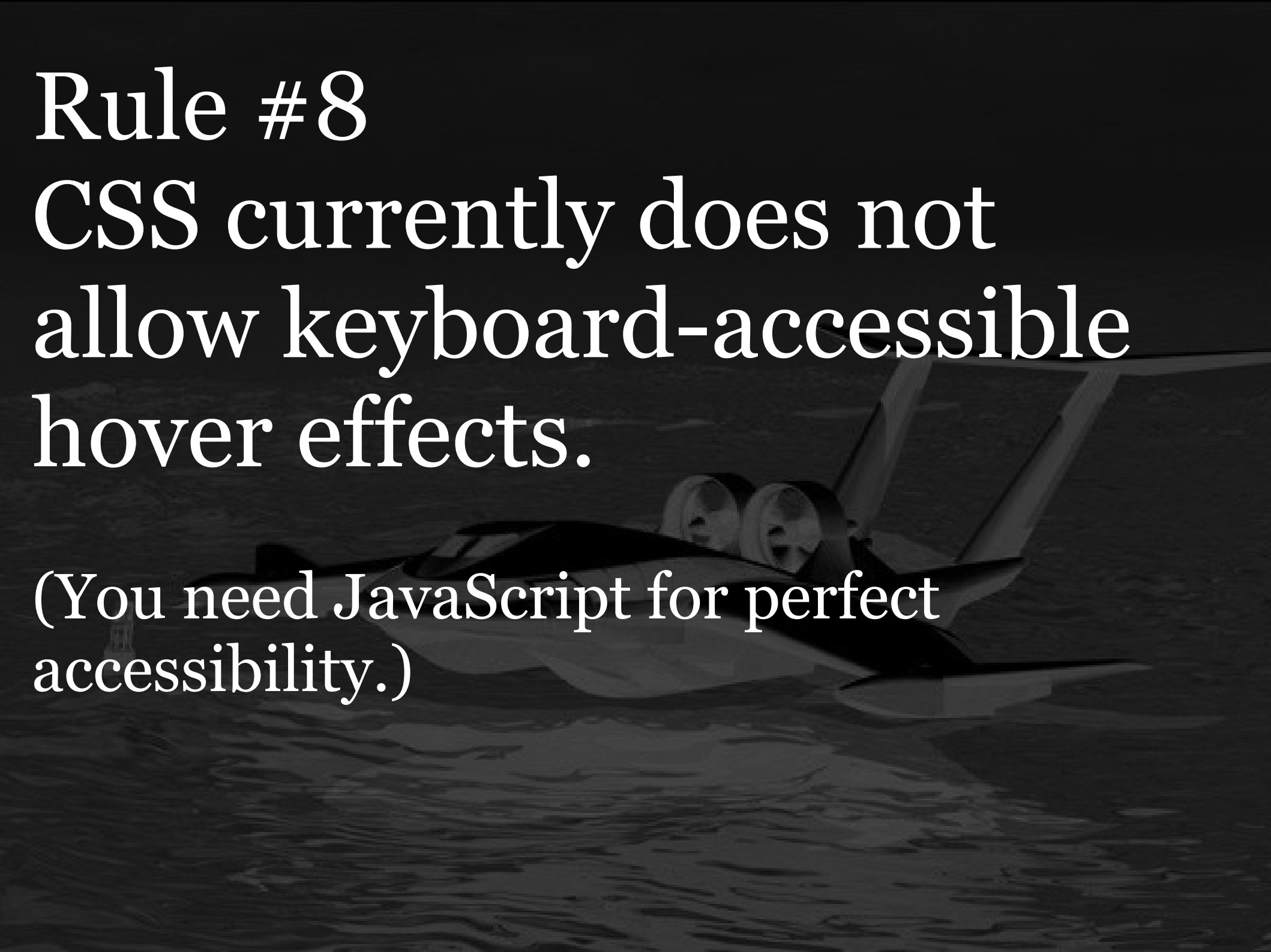
Only links, form fields, and the location bar can receive the keyboard focus in all browsers.

```
li:hover ul, (li < a:focus) ul {
   display: block;
}
```

(Don't try this at home.)

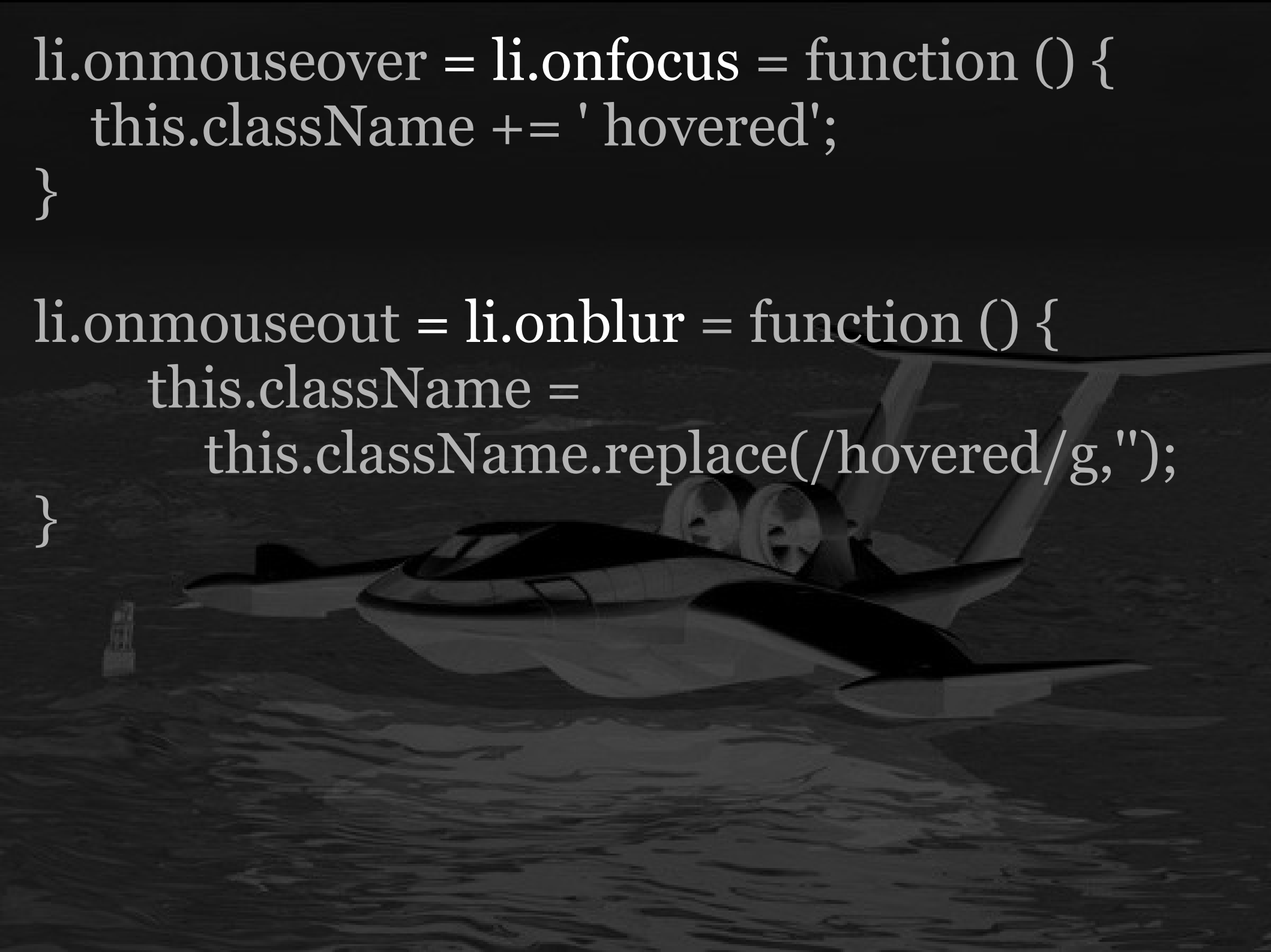



li:hover ul, (li < a:focus) ul {
display: block;
}
(Don't try this at home.)
Not supported.
(Pity, isn't it?)



Rule #8
CSS currently does not allow keyboard-accessible hover effects.

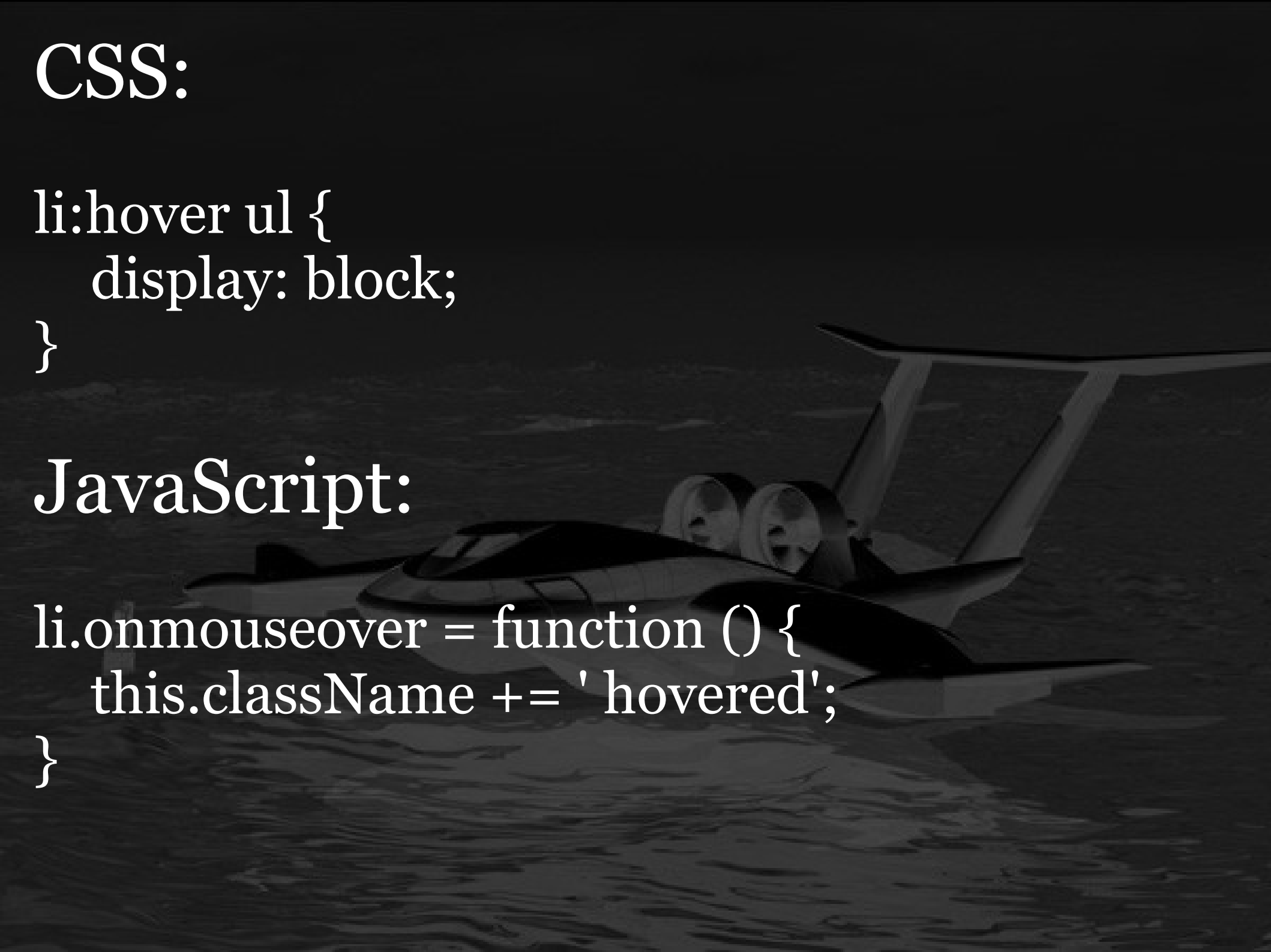
(You need JavaScript for perfect accessibility.)



```
li.onmouseover = li.onfocus = function () {
    this.className += ' hovered';
}

li.onmouseout = li.onblur = function () {
        this.className =
            this.className.replace(/hovered/g,'');
}
```

```
li.onmouseover = li.onfocus = function () {
    this.className += ' hovered';
}

li.onmouseout = li.onblur = function () {
        this.className =
            this.className.replace(/hovered/g,'');
}
```

Same problem: you can't focus on an <li>.



CSS:

```
li:hover ul {
    display: block;
}
```

JavaScript:

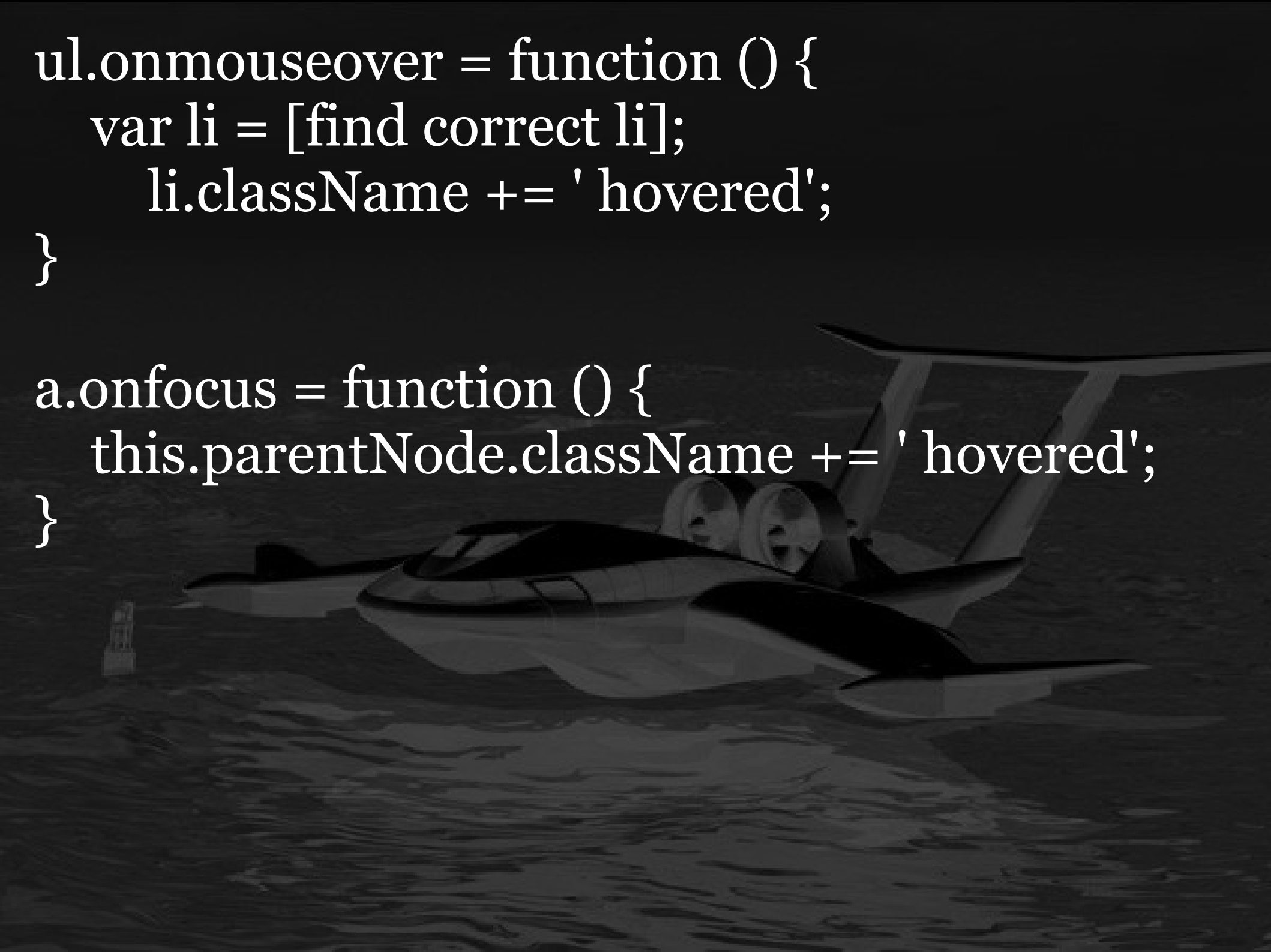
```
li.onmouseover = function () {
    this.className += ' hovered';
}
```

CSS:

```
(li < a:focus) ul {
    display: block;
}
```

JavaScript:

```
a.onfocus = function () {
    this.parentNode.className += ' hovered';
}
```



```
ul.onmouseover = function () {
    var li = [find correct li];
        li.className += ' hovered';
}

a.onfocus = function () {
    this.parentNode.className += ' hovered';
}
```

```
ul.onmouseout = function () {
    var li = [find correct li];
    if (this event is relevant)
        li.className =
            li.className.replace(/hovered/g,'');
}

a.onblur = function () {
    if (this event is relevant)
        this.parentNode.className =
            this.parentNode.className.
            replace(/hovered/g,'');
}
```


:before and :after

```
a.external:after {
    content: “ (external link)”;
}
```

Firefox: Yes
Safari: Yes
Opera: Yes
IE: No

```
var afterNode = document
    .createTextNode(' (external link)');
var links = document
    .getElementsByTagName('a');
for (var i=0;i<links.length;i++) {
    if (links[i].className != 'external') continue;
    links[i].appendChild(afterNode
        .cloneNode(true));
}
```

What happens if both the CSS and the JavaScript are executed?

“

Their findings (external link) (external link) suggest …

“

(Oops)

Situation:
- JavaScript for IE
- CSS for all other browsers

Conditional comments

```
<!--[if IE]>
  <script type=”text/javascript”
  src=”after.js”></script>
<![endif]-->
```

Rule #9

If a script is for IE only, use an IE-only way of including it.

(Conditional comments)

Option #2:
Don't use CSS at all.

Is the “ (external link)” text absolutely required?
If so, it should go in the HTML (accessibility).

If not, is it presentation or behavior?

(Personal opinion warning)

The CSS content property should not be used.
Using it is akin to using text in images.

Text belongs either in the HTML structural layer, or in the JavaScript behavior layer; but never in the CSS presentation layer.


Using JavaScript
responsibly
to plug a few holes
in browsers' CSS
support

Need any help?


Have fun!