

A WEB FOR ANYONE, ANYWHERE, ANYTIME



@rowdyrabouw

A A A B L OUS



Daredevil blind



A web for anyone, anywhere, anytime

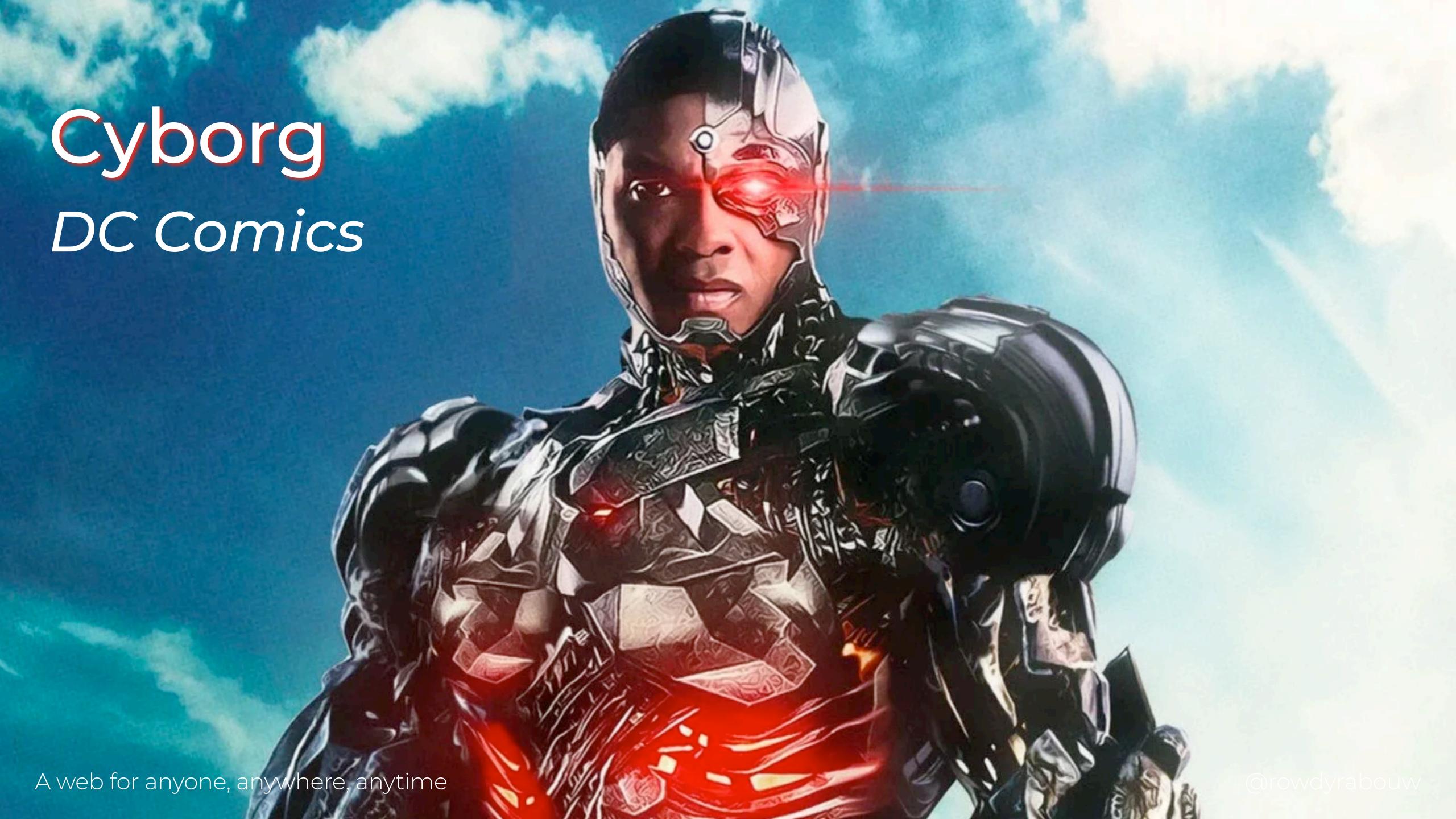
@rowdyrabouw











Rowdy Rabouw

Front-End Focused Senior DevOps Engineer with special attention for accessibility

Webdeveloper since 1996

superhero and superheroine movies





11 characters



numeronym for accessibility















WCAG2.

Web Content Accessibility Guidelines

how to make web content more accessible for people with disabilities

4 PRINCIPLES

13 guidelines — 78 success criteria

PERCEIVABLE

People must be able to find your content

OPERABLE

People must be able to use your website

UNDERSTANDABLE

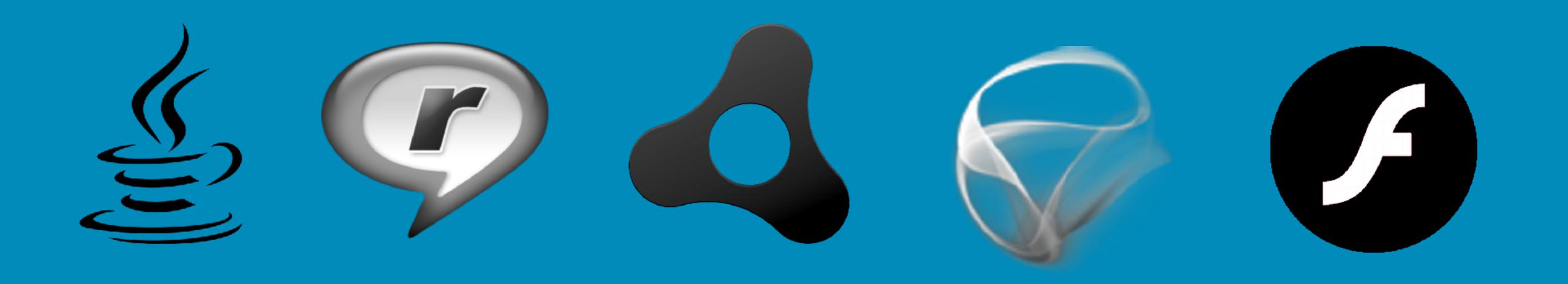
people must be able to understand your website

ROBUST

your website must work with different and future technologies

ROBUST

your website must work with different and future technologies





SEMANTIC HTML

you've got 99+ HTML elements and the DIV is just one ...



HEADINGS

```
<h1>Hulk</h1>
<h2>Hulk</h1>
<h2>Doctor Strange</h2>
<h3>Black Panther</h3>
<h4>Captain Marvel</h4>
<h5>Star-Lord</h5>
<h6>Ant-Man</h6>
```

Headings

- 1: Hulk
- 2: Doctor Strange
- 3: Black Panther
- 4: Captain Marvel
- 5: Star-Lord
- 6: Ant-Man

- only use one heading level 1 per page
- don't skip heading levels
- don't use headings for styling purposes, use classes



SECTIONING ELEMENTS

Landmarks

banner
navigation
navigation
main
complementary
content information
navigation



SECTIONING ELEMENTS

Landmarks

banner
main navigation
breadcrumbs navigation
main
complementary
content information
secondary navigation

LINK VS. BUTTON

Links

Continue

CONTINUE

Form Controls

Continue button

```
<a href="/next-page.html" class="btn">Continue</a>
```

<button type="button" class="btn" onclick="someFunction()">Continue</button>

WAI - ARIA

Web Accessibility Initiative - Accessible Rich Internet Applications

ROLES, STATES, AND PROPERTIES

alert alertdialog application article banner button cell checkbox columnheader combobox complementary contentinfo definition dialog

directory document feed figure form grid gridcell group heading img link list listbox listitem

log main marquee math menu menubar menuitem menuitemcheckbox menuitemradio navigation none note option presentation

progressbar radio radiogroup region row rowgroup rowheader scrollbar search searchbox separator slider spinbutton status

switch tab table tablist tabpanel term textbox timer toolbar tooltip tree treegrid treeitem

ROLES, STATES, AND PROPERTIES

aria-activedescendant aria-dropeffect aria-atomic aria-autocomplete aria-busy aria-checked aria-colcount aria-colindex aria-colspan aria-controls aria-current aria-describedby aria-description aria-details aria-disabled

aria-errormessage aria-expanded aria-flowto aria-grabbed aria-haspopup aria-hidden aria-invalid aria-keyshortcuts aria-label aria-labelledby aria-level aria-live aria-modal

aria-multiline aria-multiselectable aria-orientation aria-owns aria-placeholder aria-posinset aria-pressed aria-readonly aria-relevant aria-required aria-roledescription aria-rowcount aria-rowindex aria-rowspan

aria-selected aria-setsize aria-sort aria-valuemax aria-valuemin aria-valuenow aria-valuetext

FIRST RULE FOR USING ARIA

DON'T USE ARIA

native HTML elements or attributes first

SECOND RULE FOR USING ARIA

do not change native HTML semantics

THIRD RULE FOR USING ARIA

all interactive controls must be able to receive keyboard focus

```
<marvelous-button tabindex="0">.....
```

- 0 = inserts element into the natural tab order
- -1 = removes element from the natural tab order
- > 0 = jumps element to the front of the natural tab order

FOURTH RULE FOR USING ARIA

for all elements that are focusable, don't ever add role="presentation" or aria-hidden="true"

FIFTH RULE FOR USING ARIA

give all interactive elements an accessible name

```
<!-- don't do this -->
Search: <input type="text" />

<!-- do this -->
Search: <input type="text" aria-label="Search" />

<!-- or better, do this -->
<label for="search">Search</label>: <input type="text" id="search" />
```



ARIA-LABEL

overrides element's name, replacing it with text you specify

<button>x</button>



ARIA-LABEL

overrides element's name, replacing it with text you specify

<button aria-label="Close">×</button>



ARIA-LABELLEDBY

overrides element's name, replacing it with contents of another element

```
<section aria-labelledby="mcu-heading">
    <h2 id="mcu-heading">Marvel Cinematic Universe movies</h2>

            Captain America: The First Avenger
            Guardians of the Galaxy Vol. 2
            Shang-Chi and the Legend of the Ten Rings
```



ARIA-DESCRIBEDBY

sets element's description to the contents of another element

```
<form>
    <label for="username">Username</label>
    Username must be 6 to 15 characters.
    Username may contain alphanumeric characters.
    <input id="username" type="text"/>
    </form>
```



ARIA-DESCRIBEDBY

sets element's description to the contents of another element

DESCRIPTIVE LABELS

provide more information about a user interface element

```
<!-- don't do this -->
<a href="/">Read more</a>
<!-- do this -->
<a aria-label="Read more about Ant-Man" href="/">Read more</a>
<!-- or better, do this -->
<a href="/">Read more<span class="sr-only"> about Ant-Man</a>/span></a></a>
```

DESCRIPTIVE LABELS

CSS class to visually hide content, but not for screen readers

```
.sr-only:not(:focus):not(:active) {
   clip: rect(0 0 0 0);
   clip-path: inset(50%);
   height: 1px;
   overflow: hidden;
   position: absolute;
   white-space: nowrap;
   width: 1px;
}
```

PERCEIVABLE

People must be able to find your content

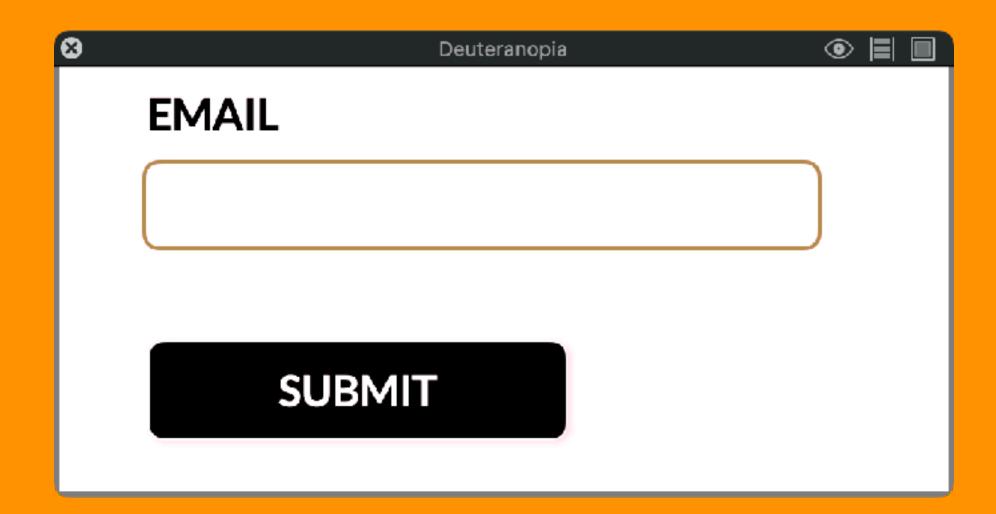
USE OF COLOR

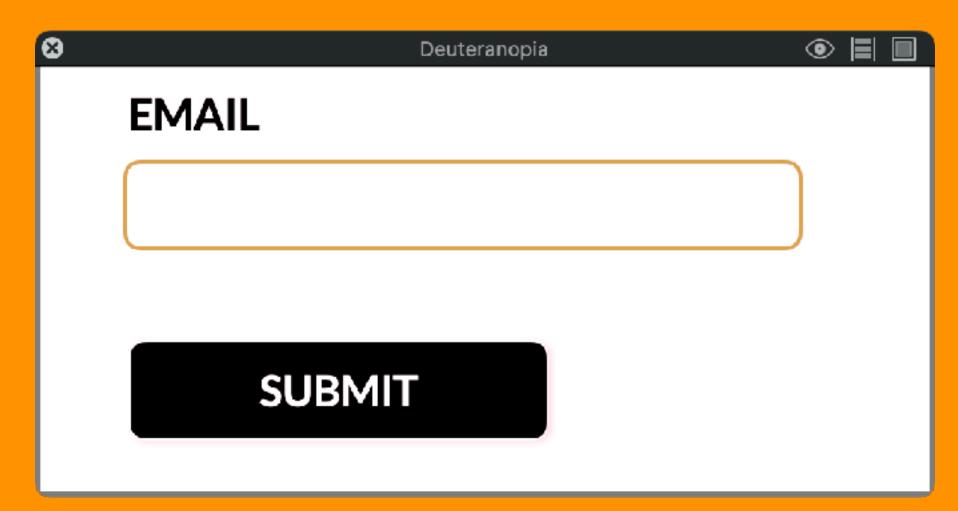
color should not be solely relied upon to convey information

DALTONISM

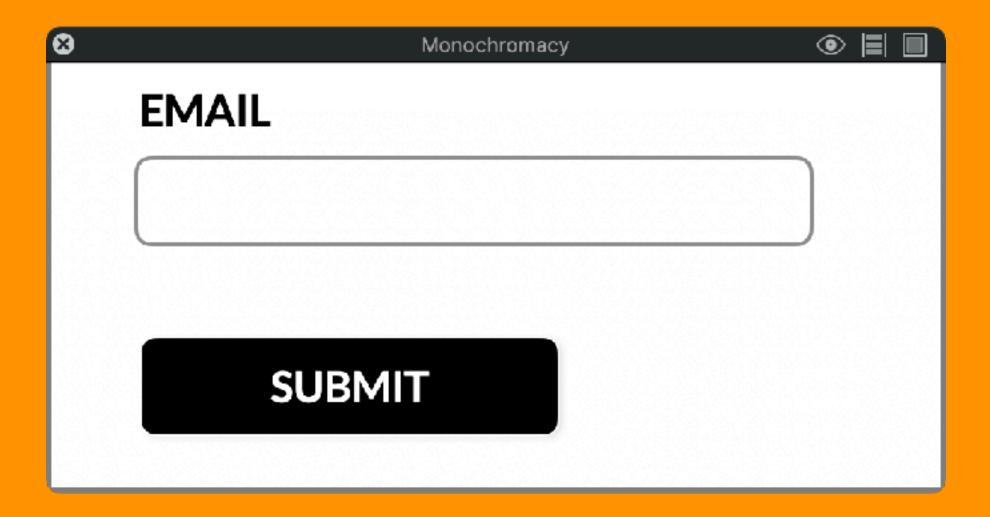
| E | EMAIL | |
|---|--------|--|
| | | |
| | SUBMIT | |

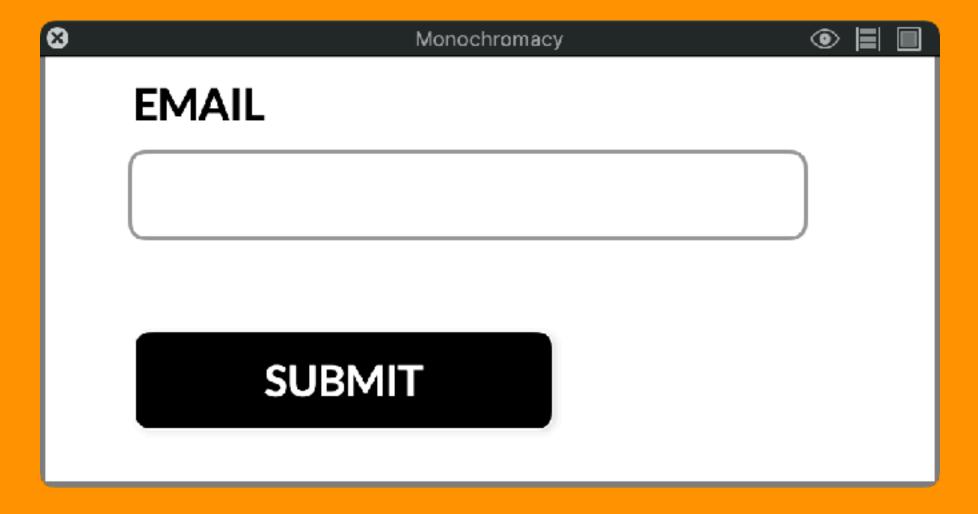
DEUTERANOPIA





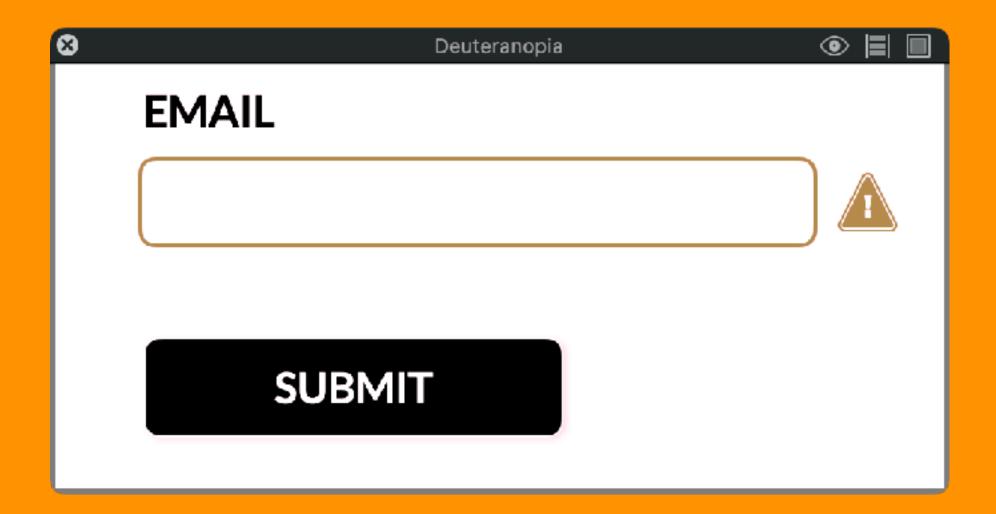
MONOCHROMACY

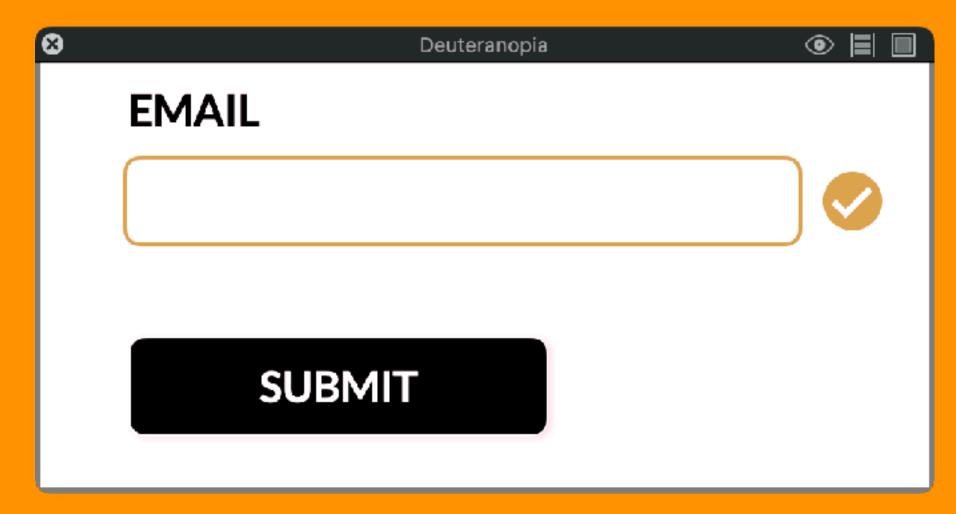




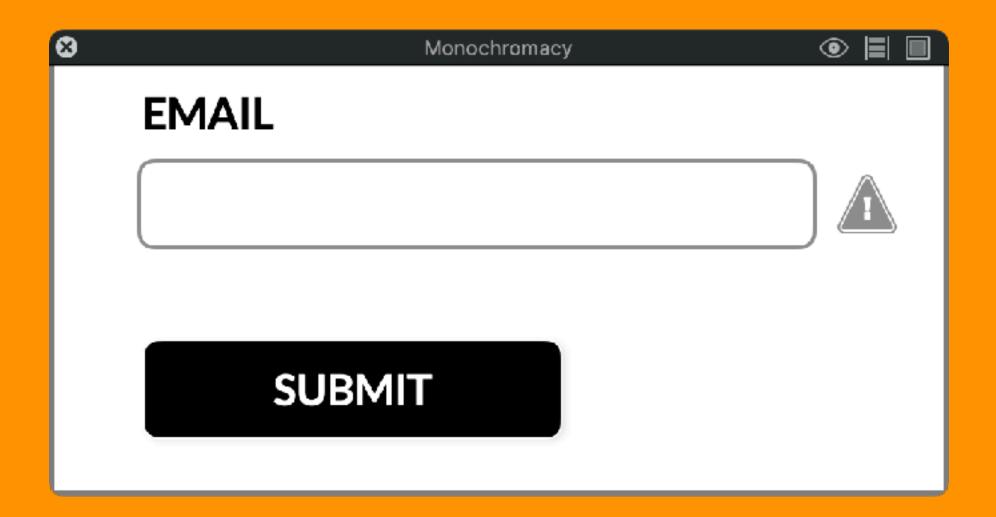


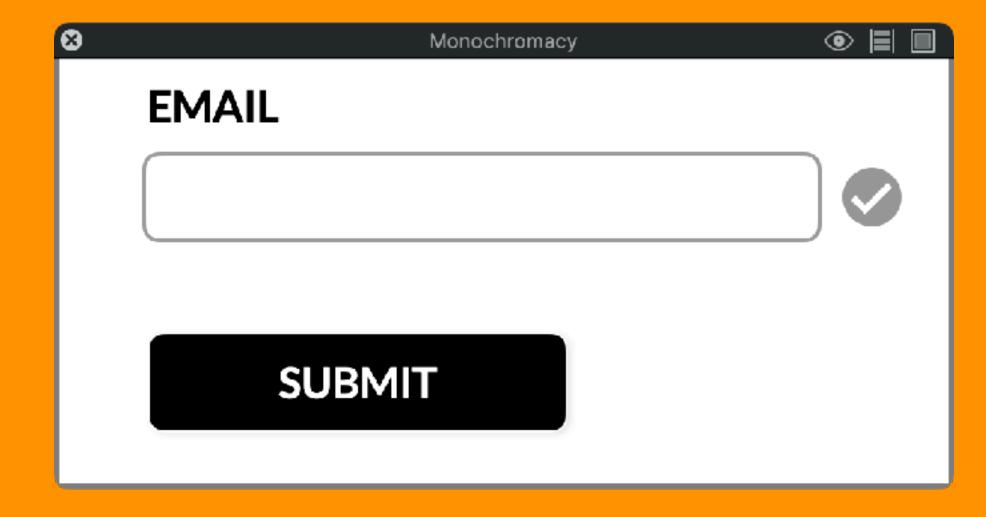
DEUTERANOPIA





MONOCHROMACY





COLOR CONTRAST

color contrast between background and foreground content should be at a minimum level to ensure legibility



LOW CONTRAST TEXT 83,9%

The WebAIM Million
https://webaim.org/projects/million/

CONTRAST RATIO

can range from 1 to 21 (commonly written 1:1 to 21:1)

text should have a minimum ratio of 4.5:1 large text or bold text should have a minimum ratio of 3:1

18pt ≈ 24px 14pt bold ≈ 18.5px

(L1 + 0.05) / (L2 + 0.05)

L1 is the relative luminance of the lighter of the two colors, and L2 is the relative luminance of the darker of the colors

RELATIVE LUMINANCE

relative brightness of any point in a colorspace

0

1

for the sRGB colorspace, the relative luminance of a color is defined as L = 0.2126 * R + 0.7152 * G + 0.0722 * B

where R, G and B are defined as

```
if RsRGB <= 0.04045 then R = RsRGB/12.92 else R = ((RsRGB+0.055)/1.055) ^2 2.4 if GsRGB <= 0.04045 then G = GsRGB/12.92 else G = ((GsRGB+0.055)/1.055) ^2 2.4 if BsRGB <= 0.04045 then B = BsRGB/12.92 else B = ((BsRGB+0.055)/1.055) ^2 2.4
```

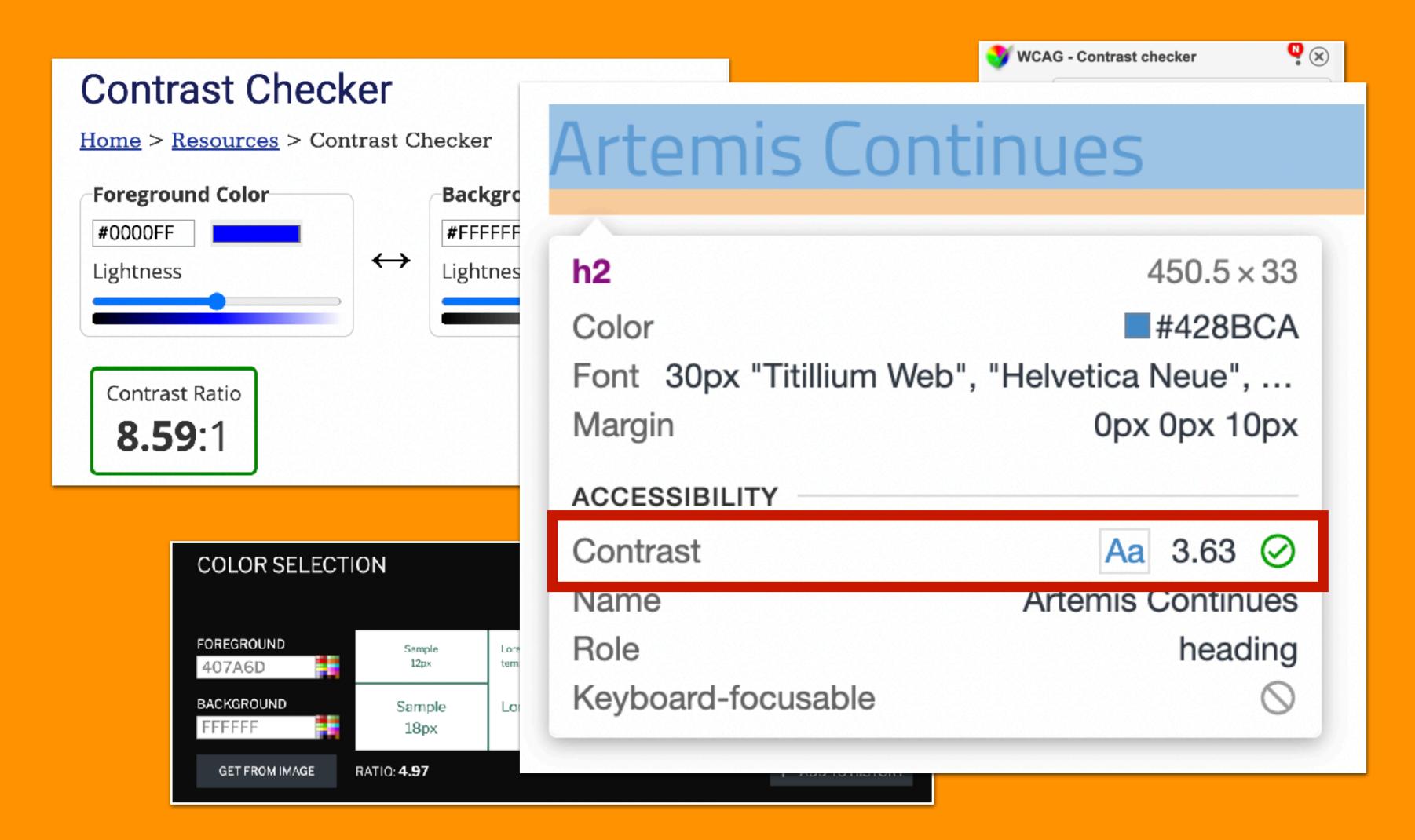
and RsRGB, GsRGB, and BsRGB are defined as

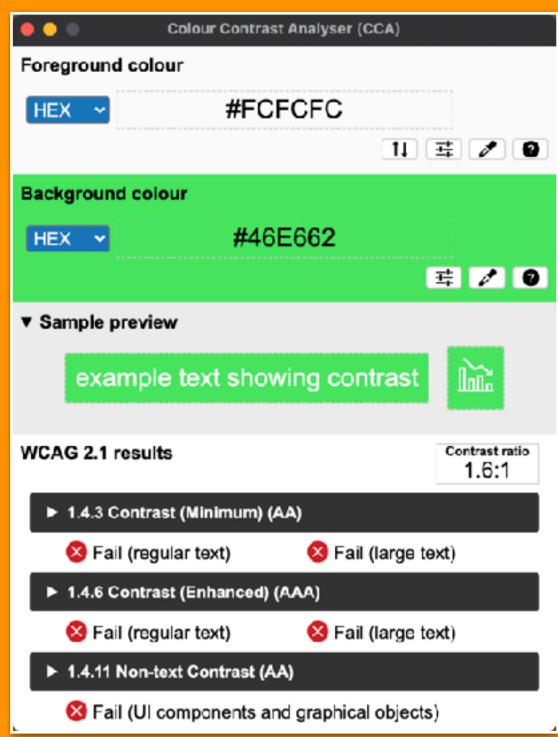
RsRGB = R8bit/255

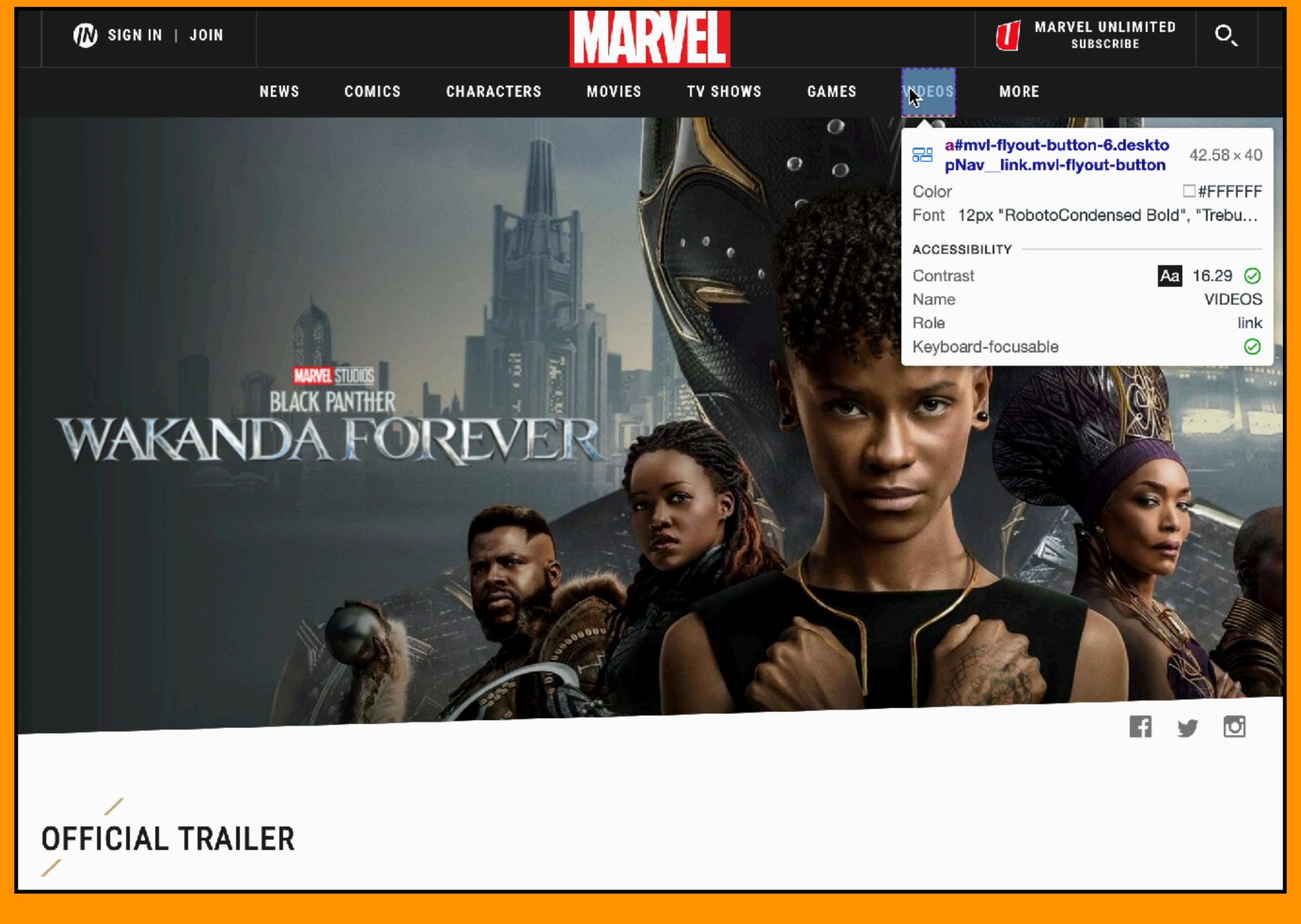
GsRGB = G8bit/255

BsRGB = B8bit/255

COLOR CONTRAST CHECKERS











CONTRAST RATIO

BE CAREFUL WITH TEXT SHADOWS

BE CAREFUL WITH TEXT OUTLINES



ALTIEXT

all images that convey meaningful content should be given suitable alternative text



MISSING ALTERNATIVE TEXT 55,4%

The WebAIM Million
https://webaim.org/projects/million/



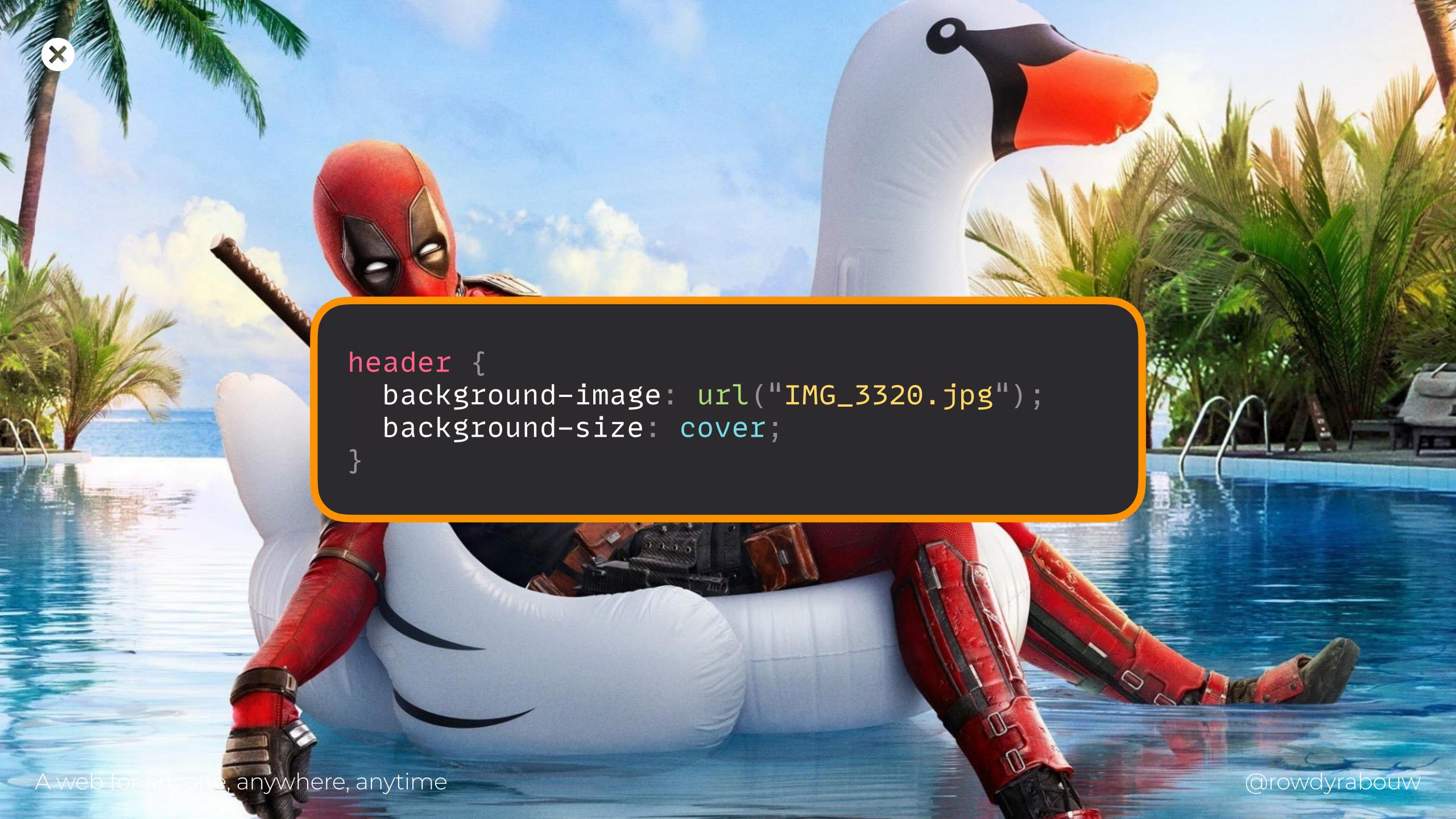






```
<img
src="-mg-9370-1.jpg"
alt="Nick Fury is holding Goose the Flerken. Multiple tentacles extend
from Goose's mouth in order to swallow the Tesseract. Captain Marvel
(seen from the back) is holding the Tesseract." />
```





CAPTIONS

provide captions for video presented on the web for the benefit of people who can't hear the audio part of the video



SUBTITLES

translation for viewers who may not speak the language

CLOSED CAPTIONS

not only show what's being said but also describe other sounds

OPEN CAPTIONS

burnt into the video and can't be turned off



AUDIO DESCRIPTIONS

audio descriptions should be provided if the existing audio does not convey the full meaning expressed by the video



ORIGINAL VIDEO HIDDEN ON PURPOSE



AUDIO DESCRIBED VIDEO HIDDEN ON PURPOSE



OPERABLE

People must be able to use your website

visual indicator must be shown for currently focused element



I'm the strongest Avenger, okay?

Okay, so the "how" works. Now we gotta figure out the when and the where. Almost all of us has had an encounter with at least one of the six <u>Infinity Stones</u>. Look, us sitting here staring at that thing is not gonna bring everybody back. I'm the strongest Avenger, okay? So this responsibility falls upon me. It's my duty.

- Iron man
- Captain America
- Black Widow

Favorite Avenger

pick up Mjölnir



I'm the strongest Avenger, okay?

Okay, so the "how" works. Now we gotta figure out the when and the where. Almost all of us has had an encounter with at least one of the six <u>Infinity Stones</u>. Look, us sitting here staring at that thing is not gonna bring everybody back. I'm the strongest Avenger, okay? So this responsibility falls upon me. It's my duty.

- Iron man
- Captain America
- Black Widow

Favorite Avenger

pick up Mjölnir

```
/* don't do this */
*:focus {
  outline: 0;
}
```



I'm the strongest Avenger, okay?

Okay, so the "how" works. Now we gotta figure out the when and the where. Almost all of us has had an encounter with at least one of the six <u>Infinity Stones</u>. Look, us sitting here staring at that thing is not gonna bring everybody back. I'm the strongest Avenger, okay? So this responsibility falls upon me. It's my duty.

- Iron man
- Captain America
- Black Widow

Favorite Avenger

pick up Mjölnir

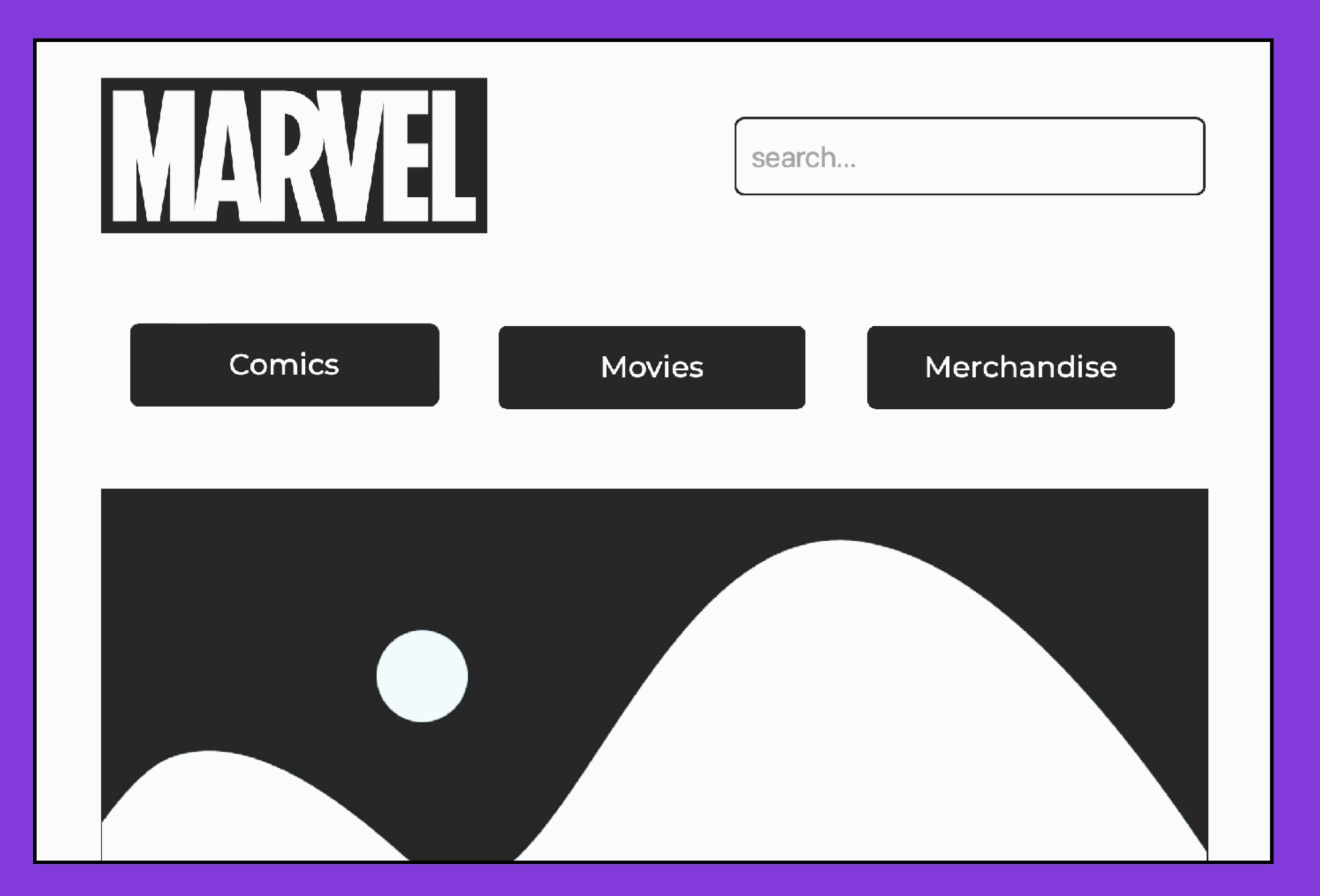


```
/* you can do this */
*:focus {
  outline: 0;
}
/* if you also do this */
```

```
a:focus {
  color: #fff;
  box-shadow: inset 250px 0 0 0 #c02f39;
  transition: color 0.3s ease-in-out,
              box-shadow 0.3s ease-in-out;
label:focus-within {
  background-color: #c02f39;
  color: #fff;
  padding-right: 0.5rem;
input[type="text"]:focus {
  border: 2px dashed #c02f39;
  color: #c02f39;
button:focus {
  background-color: #c02f39;
  color: rgb(255, 255, 255);
```

SKIP TO CONTENT

make it easy to skip segments

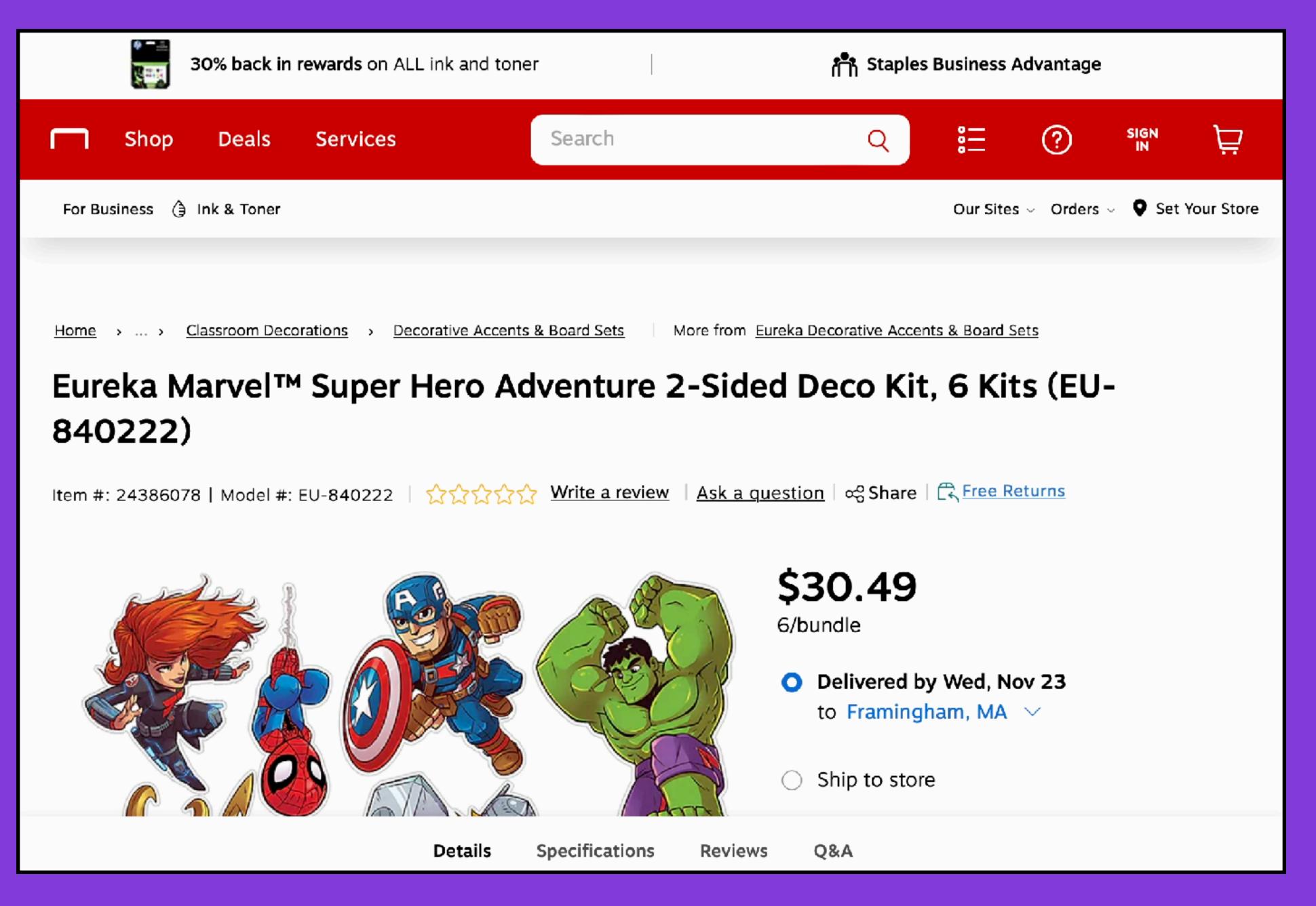




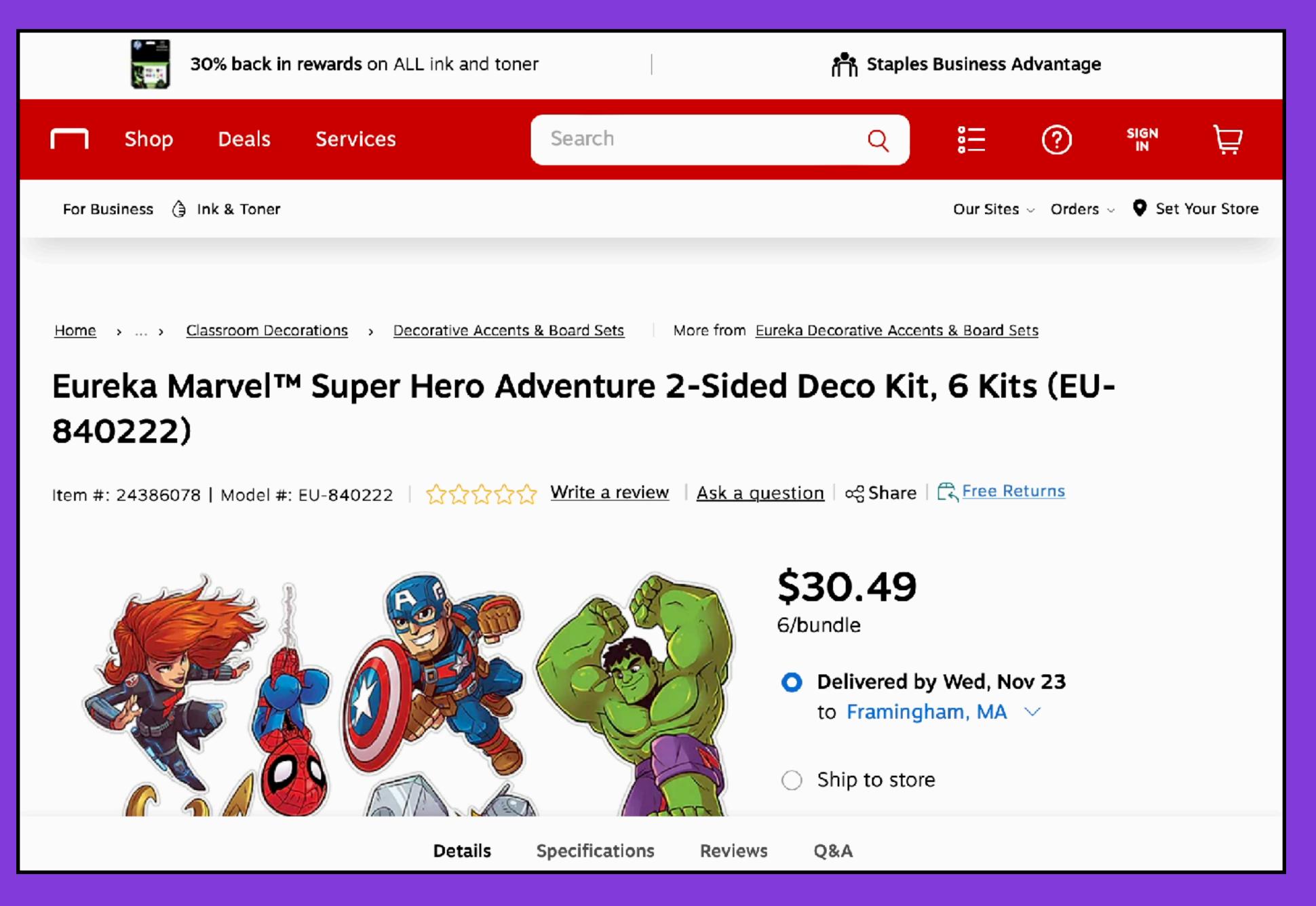
```
<body>
     <a href="#main-content" class="skip-link">Skip to content</a>
     <header>
     <main id="main-content">
          <h1>Avengers Endgame Ipsum</h1></main
```

```
.skip-link {
 clip: rect(1px, 1px, 1px, 1px);
 display: block;
 height: 1px;
 overflow: hidden;
 position: absolute;
 width: 1px;
 top: 1rem;
 left: 1rem;
 z-index: 999;
  outline: 0;
 text-decoration: none;
```

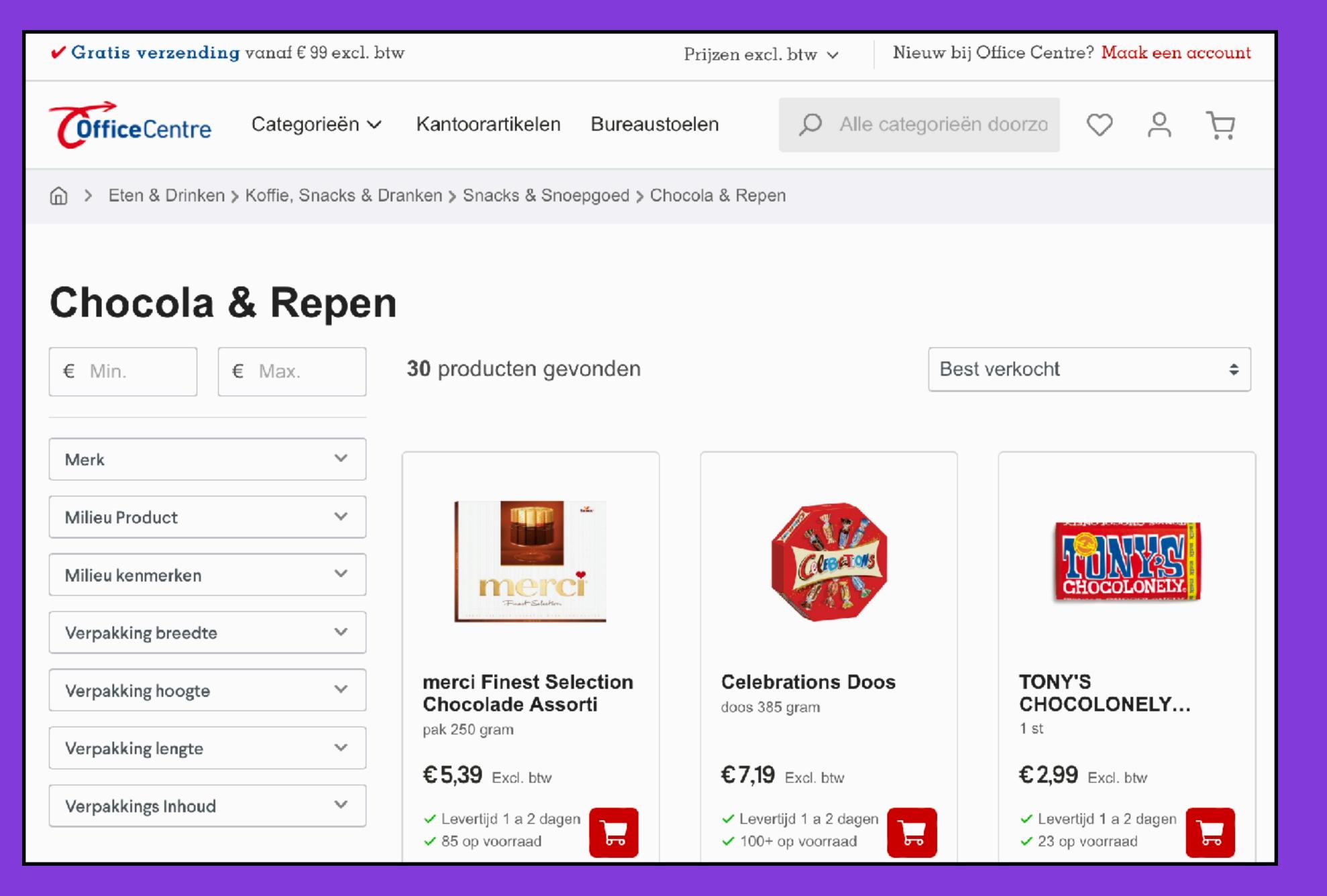
```
.skip-link:focus {
 clip: auto;
 height: auto;
 overflow: visible;
 width: auto;
 color: #fff;
 background-color: #282828;
 border: 4px solid #fff;
 border-radius: 0.5em;
 padding: 0.75rem 1.5rem;
```

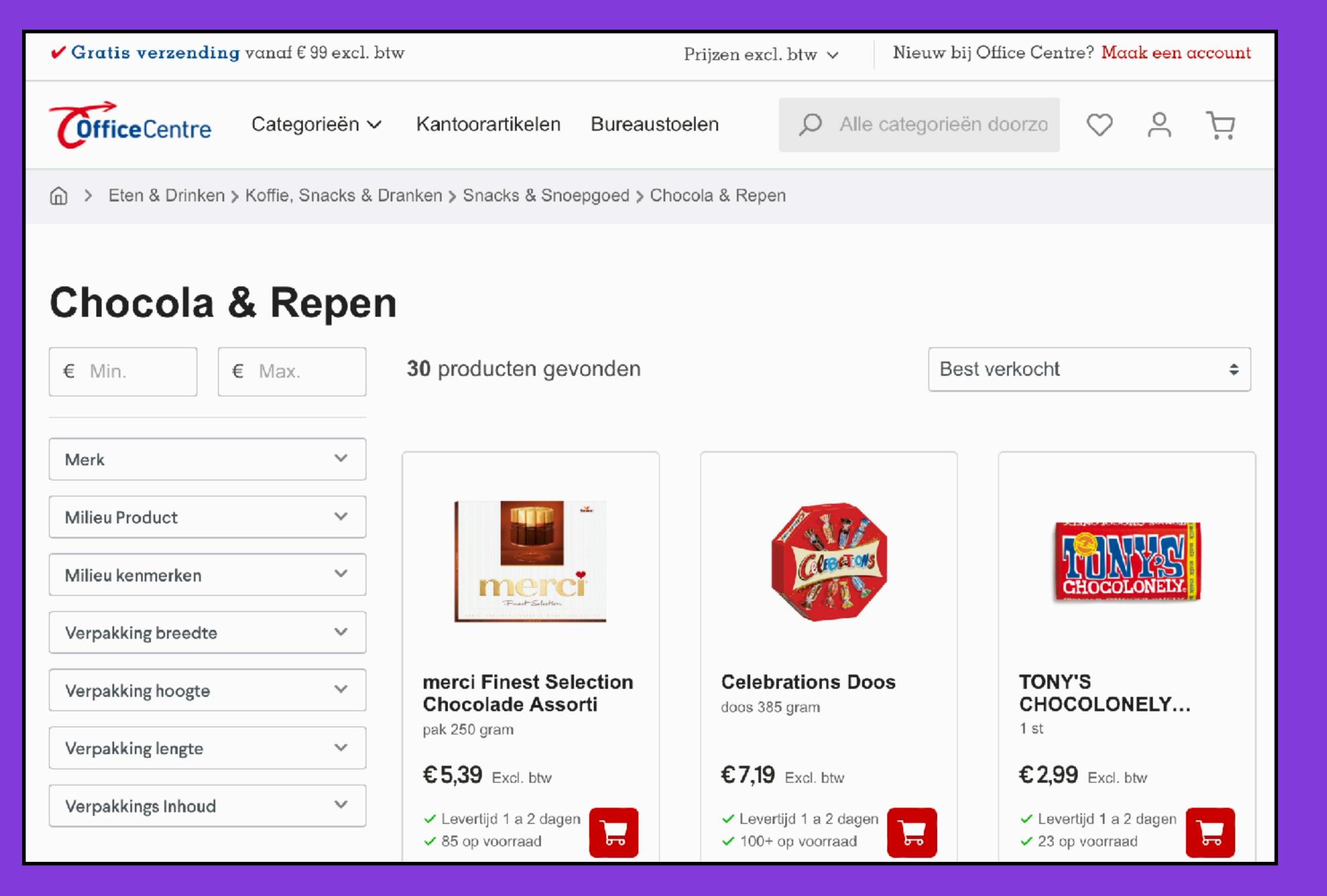












UNDERSTANDABLE

people must be able to understand your website

LANG ATTRIBUTE

specifies the natural language of the content



MISSING DOCUMENT LANGUAGE 22,3%

The WebAIM Million
https://webaim.org/projects/million/

- screen readers
- search engines



Un sourire coûte moins cher que l'électricité, mais donne autant de lumière.

```
<blockquote>Un sourire coûte moins cher que
l'électricité, mais donne autant de lumière.
<!--
A smile costs less than electricity, but gives as much light. — Abbé Pierre

→</pre>
```



Un sourire coûte moins cher que l'électricité, mais donne autant de lumière.

```
<blockquote lang="fr">Un sourire coûte moins cher que
l'électricité, mais donne autant de lumière.
<!--
A smile costs less than electricity, but gives as
much light. — Abbé Pierre

→</pre>
```



من طلب العلى سيهر الليالي

```
<blockquote lang="ar">من طلب العلى سهر الليالي
<!—
He who desires the top must sit up many nights
aka The road to success is paved with hard work
— Arabic proverb
—</pre>
```



من طلب العلى سهر الليالي

```
@font-face {
  font-family: "cairo-regular";
  src: url("/assets/fonts/cairo.woff") format("woff");
}
:lang(ar) {
  font-family: "cairo-regular", serif;
  direction: rtl;
}
```

FORMS



MISSING FORM INPUT LABELS

46,1%

The WebAIM Million

https://webaim.org/projects/million/

FORM INPUT LABEL

```
←!— please don't do this →
  <form>
     <input name="email" placeholder="E-mail" />
      <button class="btn">Submit</button>
  </form>
```

```
<!-- do this -->
<form>
    <label for="email">E-mail</label>
        <input id="email" name="email" />
        <button class="btn">Submit</button>
        </form>
```

PLACEHOLDER ATTRIBUTE

DATE OF BIRTH DD-MM-YYYY

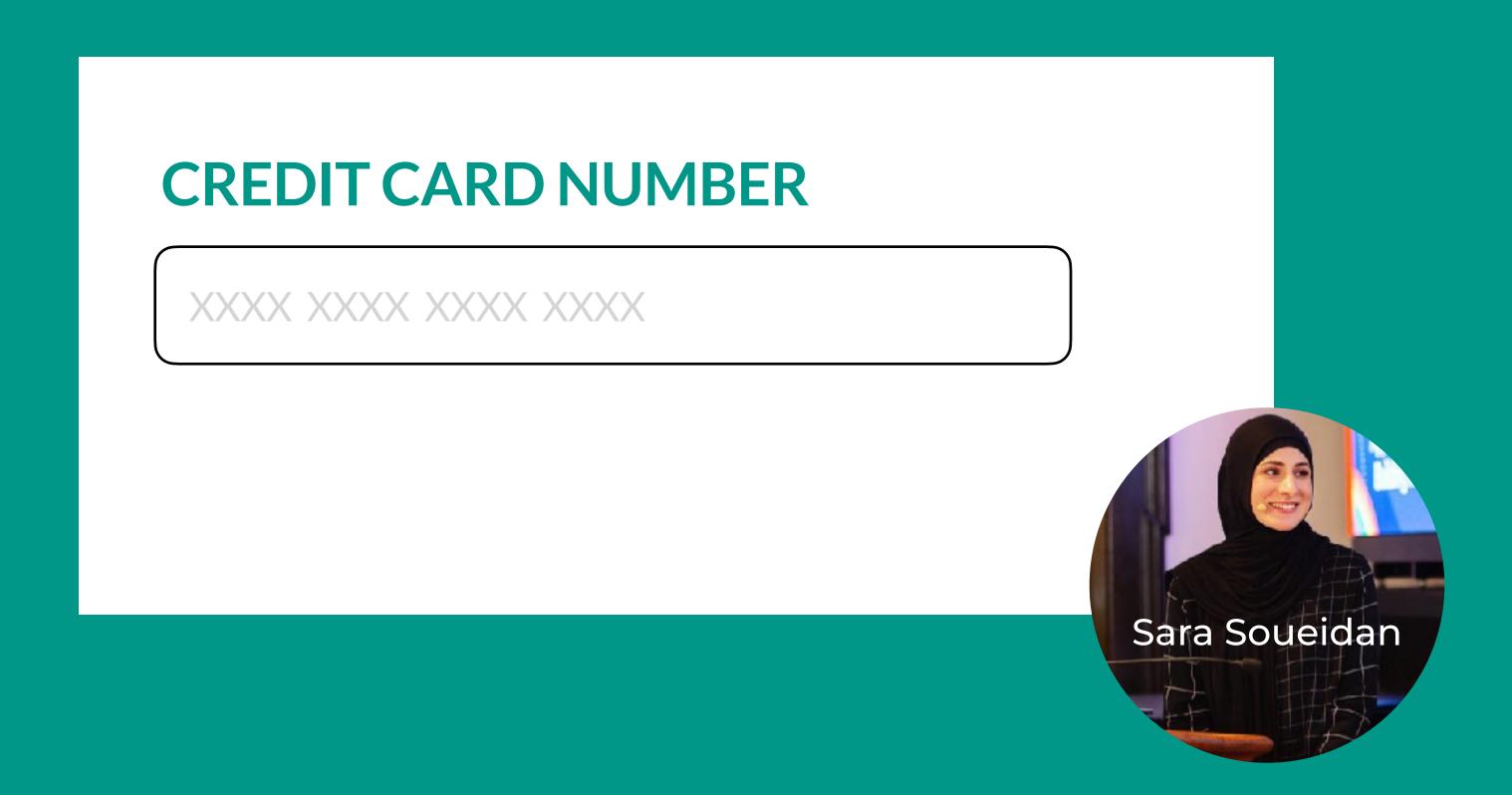
- hard to read
- hard to remember

PLACEHOLDER ATTRIBUTE

| DATE OF BIRTH | |
|--------------------|--|
| Format: DD-MM-YYYY | |
| | |
| | |
| | |



PLACEHOLDER ATTRIBUTE



ERROR MESSAGES



01-23456789



Please enter a valid phone number

- what's wrong?

ERROR MESSAGES

PHONE NUMBER

01-23456789



Please only enter digits



ERROR MESSAGES

PHONE NUMBER

0123456789



LEGIBILITY

PEOPLE WITH MINIMAL EDUCATION, DYSLEXIA OR INTELLECTUAL DISABILITIES

- * Do not use difficult words or metaphors
- * Keep sentences short
- * Use positive sentences and active language
- * Use a font that is easy to read
- * Do not put text too close together
- * DO NOT OVERUSE ALL CAPS

A særifffontis ilsahærdærdærdærde.

MAKETHE WEB A BETTER PLACE

Excelsior!

DARKMODE

let the user choose

○ 🗅 🗝 127.0.0.1:3002/simple-dark-mode/index.html



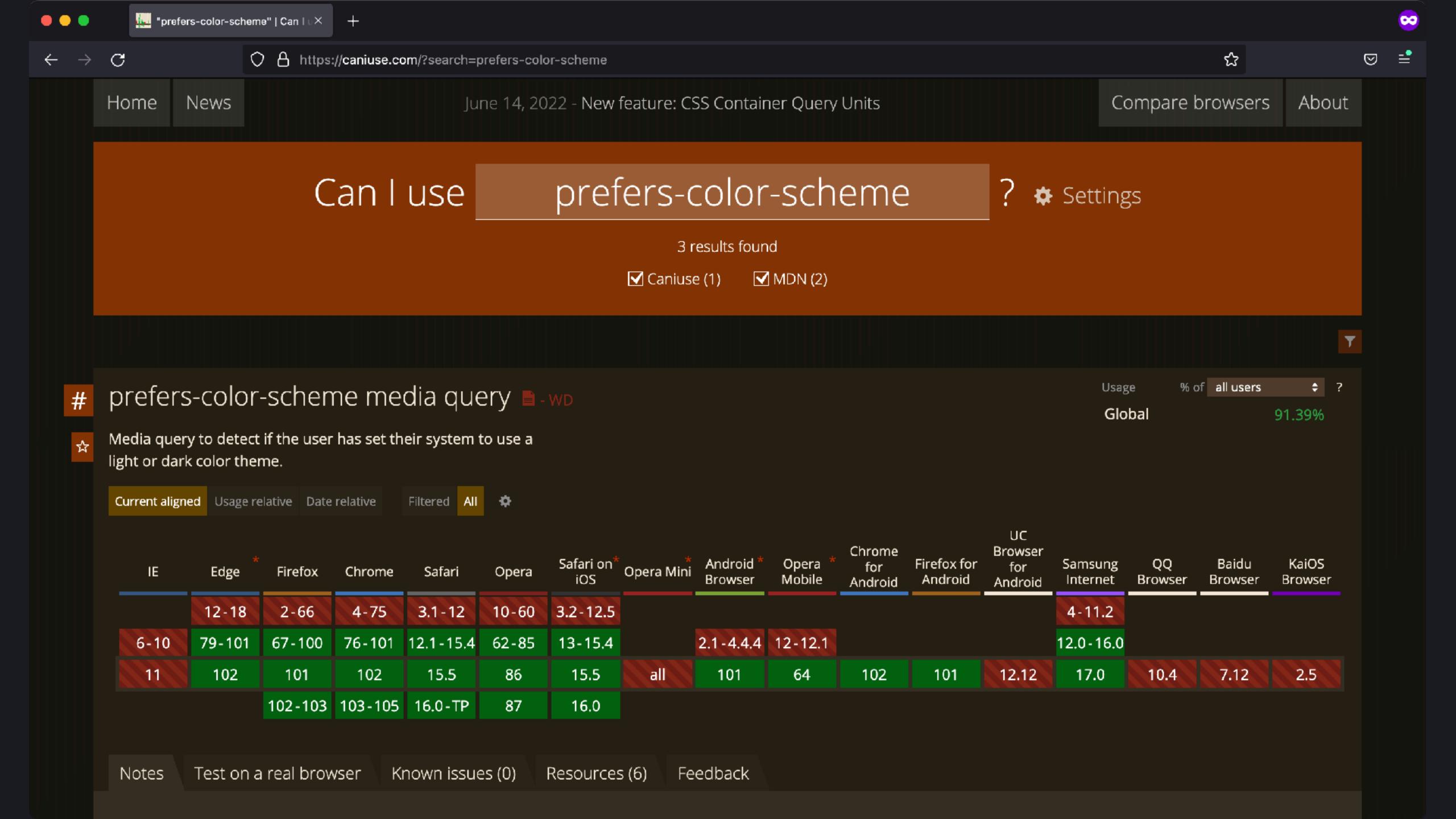
prefers-color-scheme

Detect if the user prefers a light or dark color theme.

The user can indicate this through an OS or browser setting.

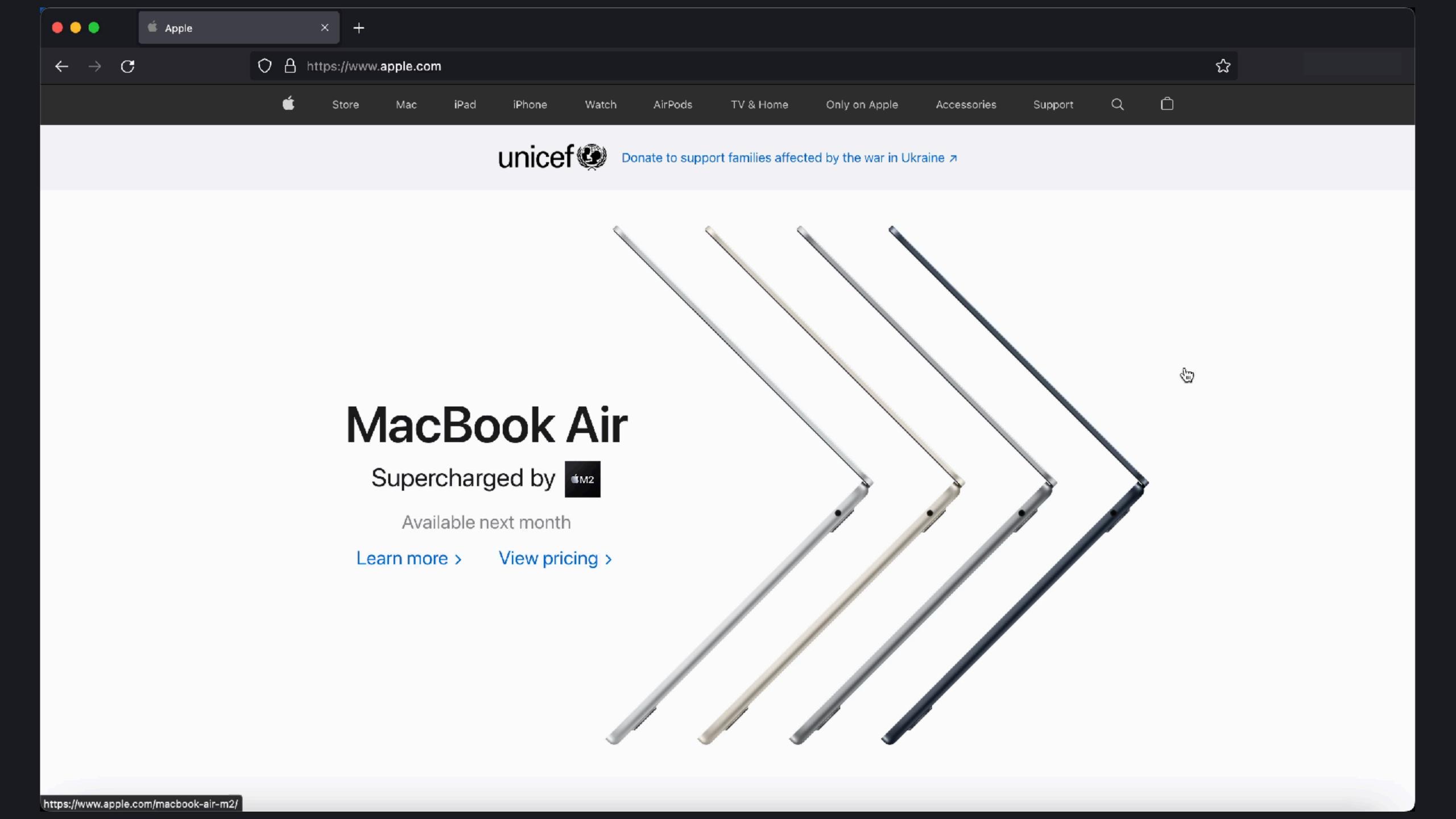
```
:root {
  --light: rgb(238, 238, 238);
  --dark: rgb(68, 68, 68);
body {
  background: var(--light);
  color: var(--dark);
@media (prefers-color-scheme: dark) {
  body |
    background: var(--dark);
    color: var(--light);
```

```
:root {
  --light: rgb(238, 238, 238);
  --dark: rgb(68, 68, 68);
body {
  background: var(--light);
  color: var(--dark);
@media (prefers-color-scheme: dark) {
  body {
    background: var(--dark);
    color: var(--light);
```



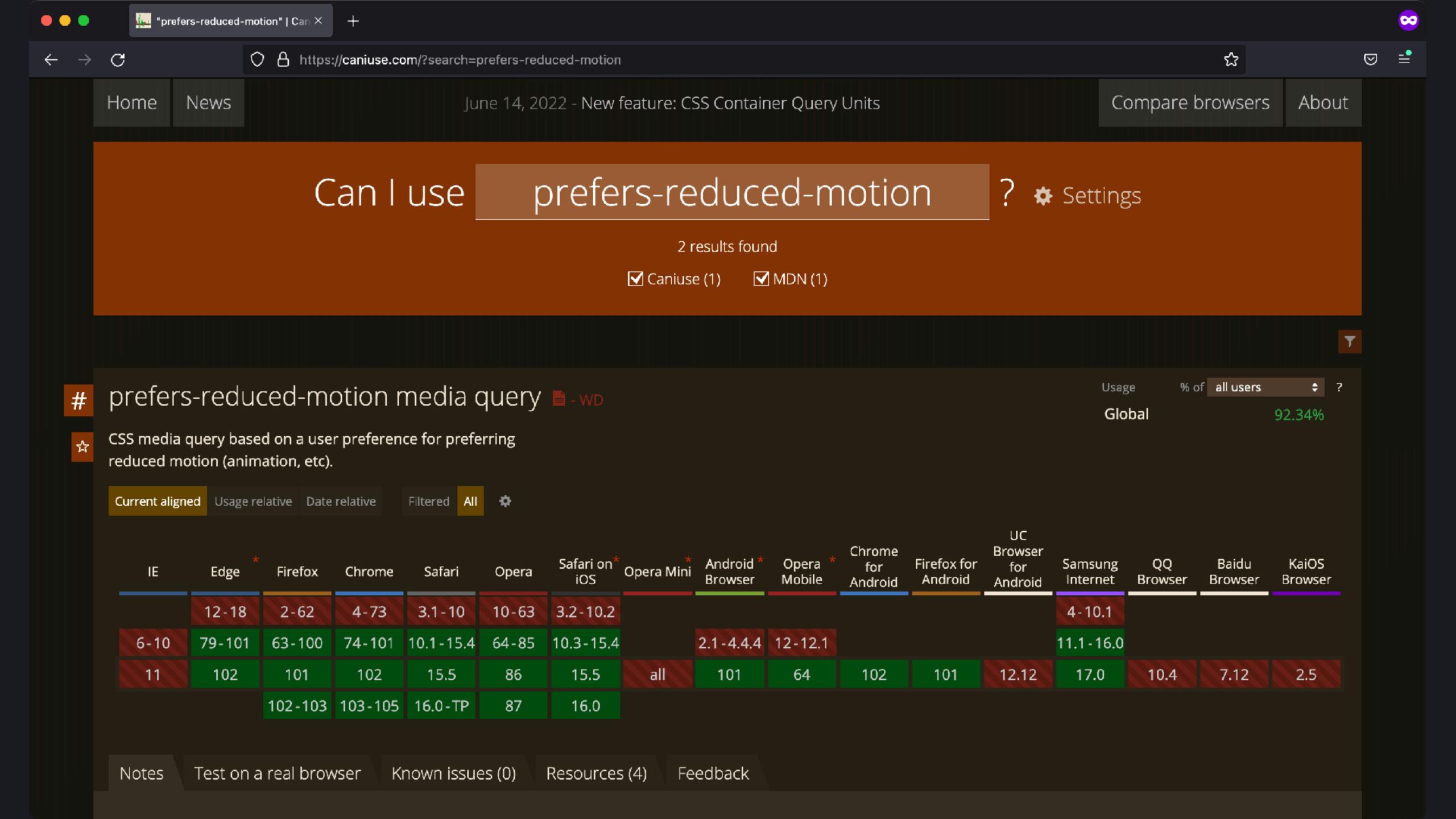
REDUCE MOTION

stop making people with motion sensitivities sick



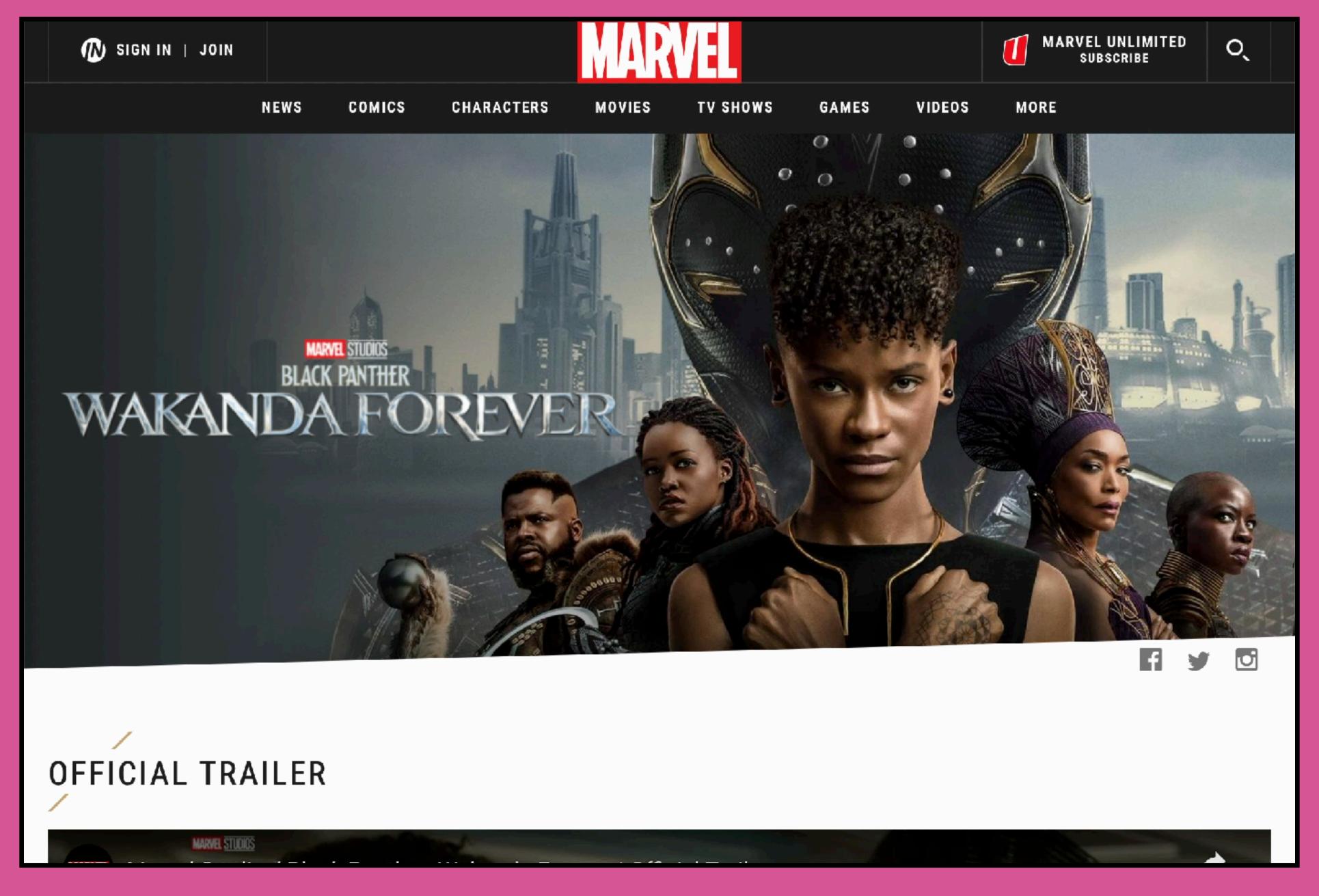
```
h1 {
   animation: bouncing 1.5s linear infinite alternate;
}

@media (prefers-reduced-motion: reduce) {
   h1 {
      animation: none;
   }
}
```



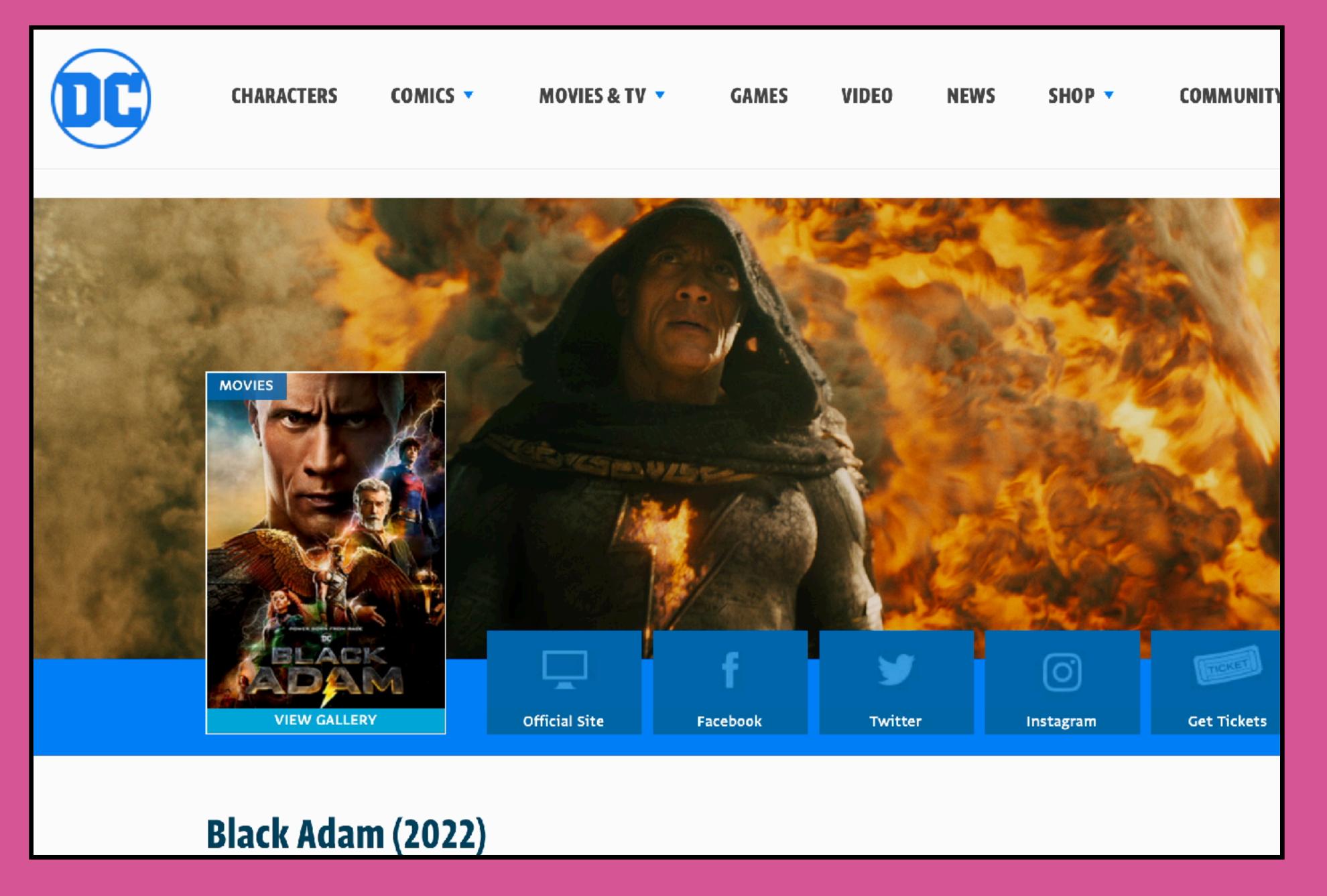
PRINT CSS

save the planet one paper sheet at a time











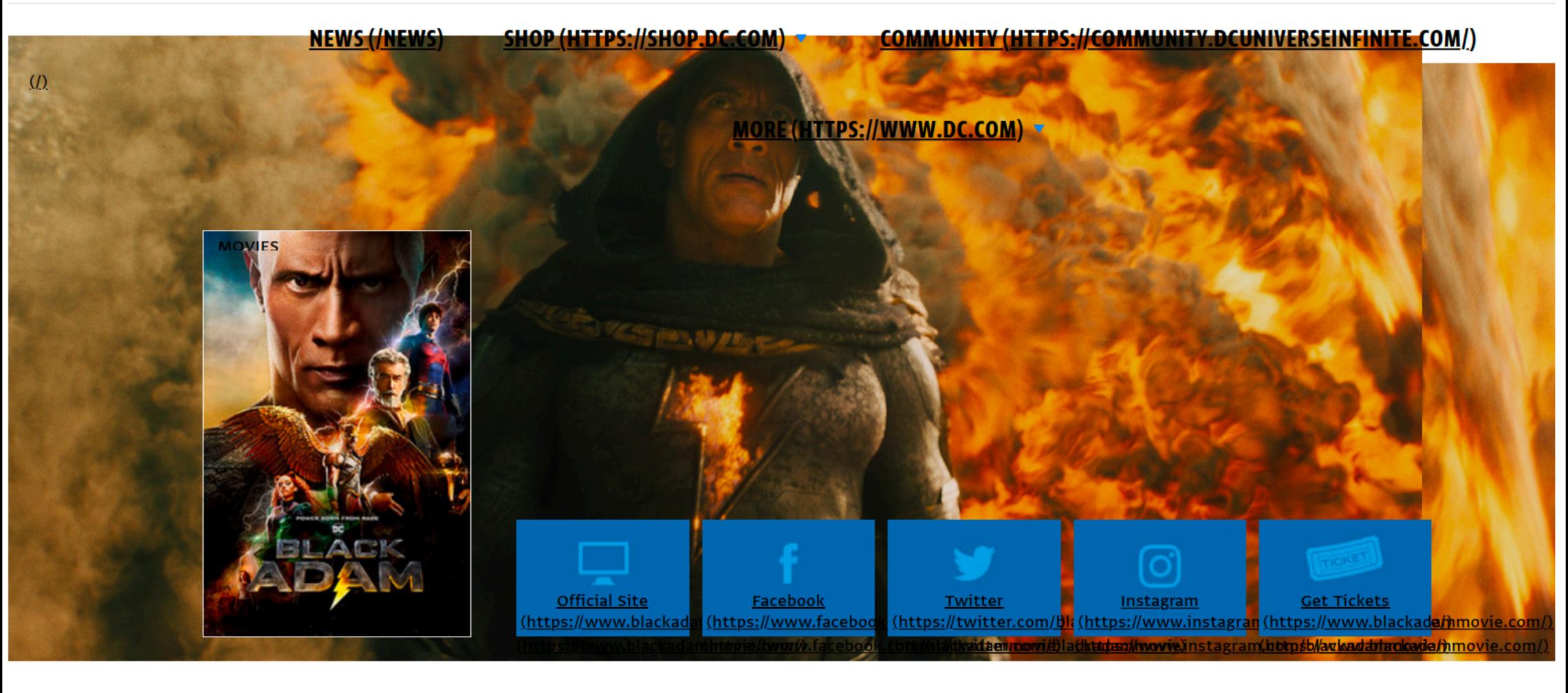
CHARACTERS (/CHARACTERS)

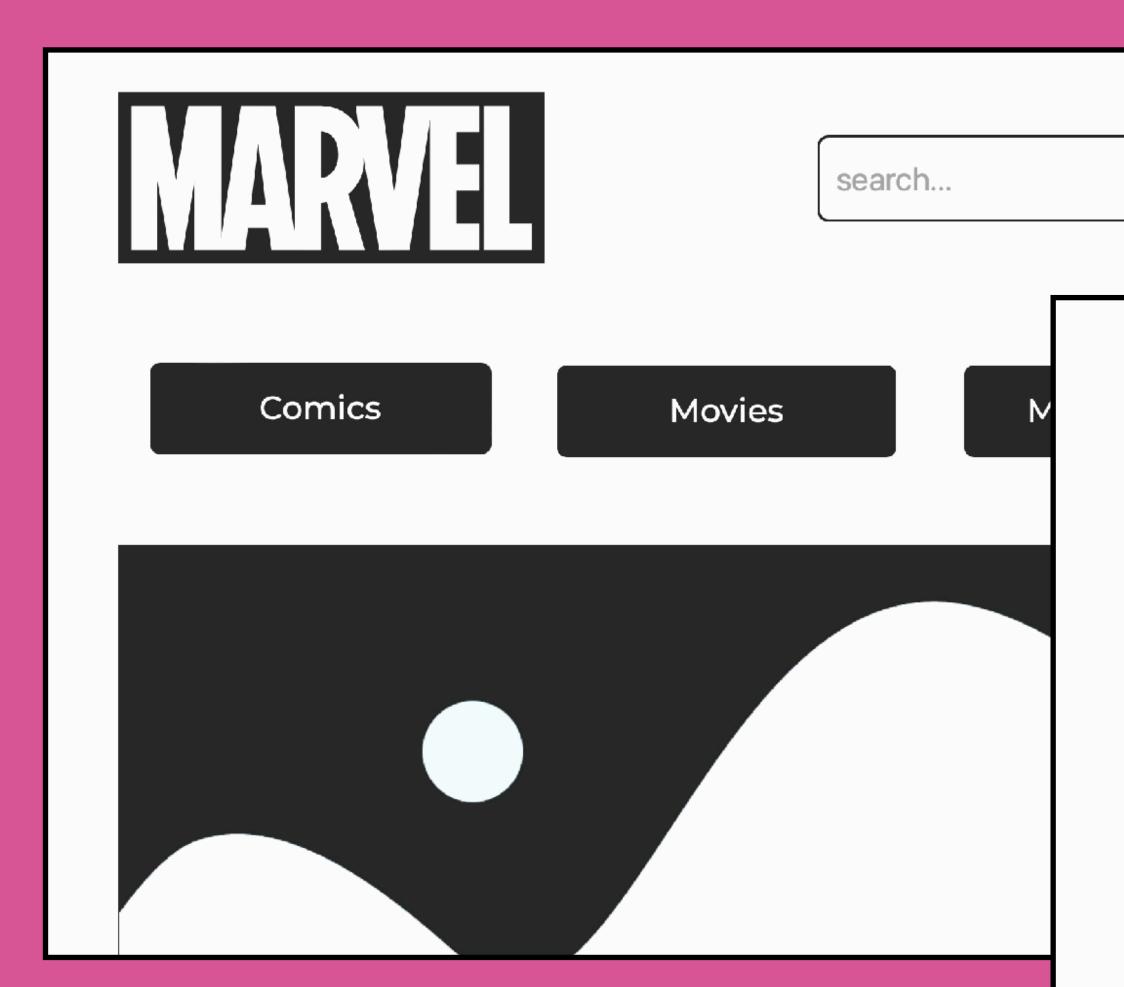
<u>COMICS</u> (/<u>COMICS</u>) ▼

MOVIES & TV_(HTTPS://WWW.DC.COM)

GAMES (/GAMES)

<u>VIDEO (/VID</u>

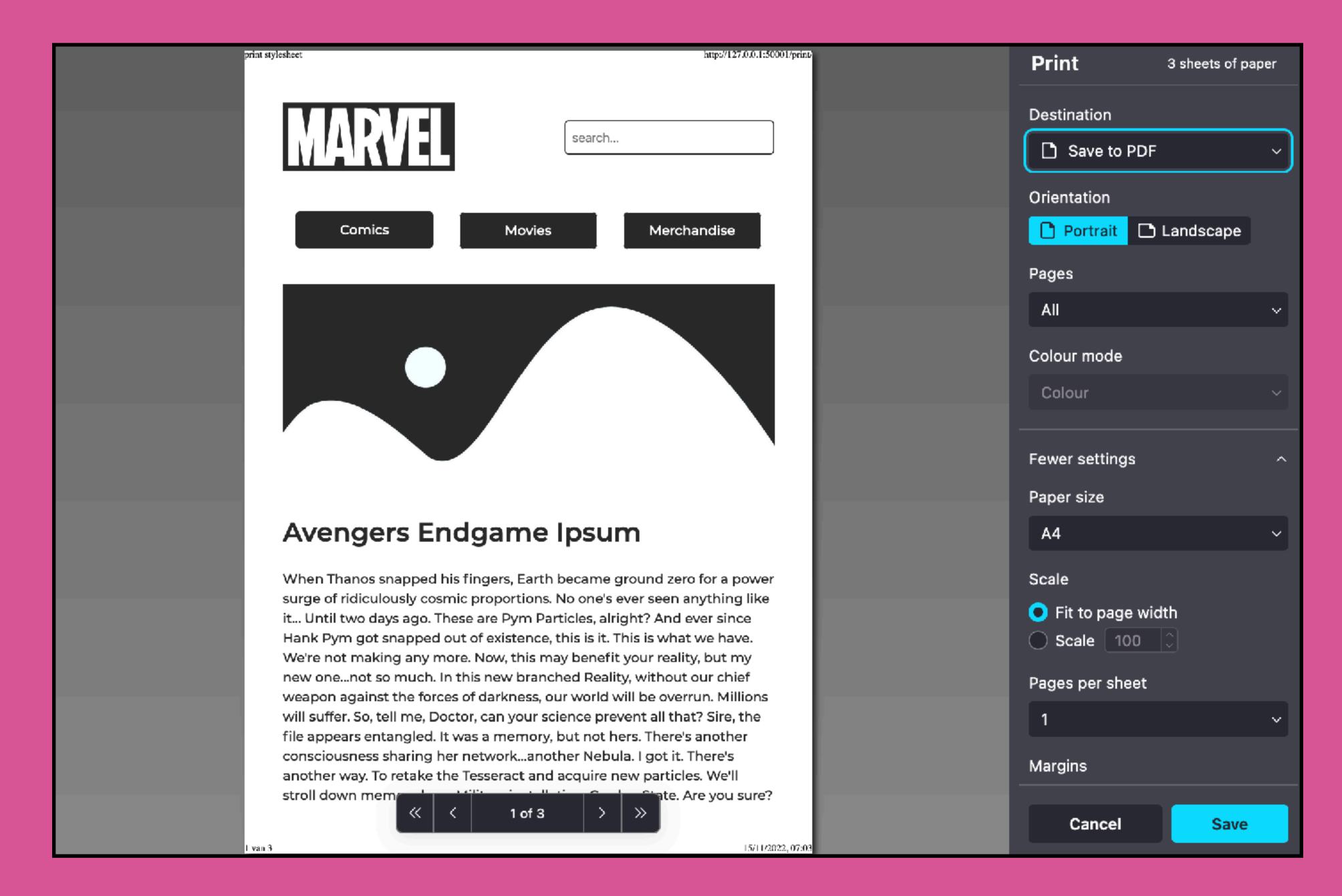


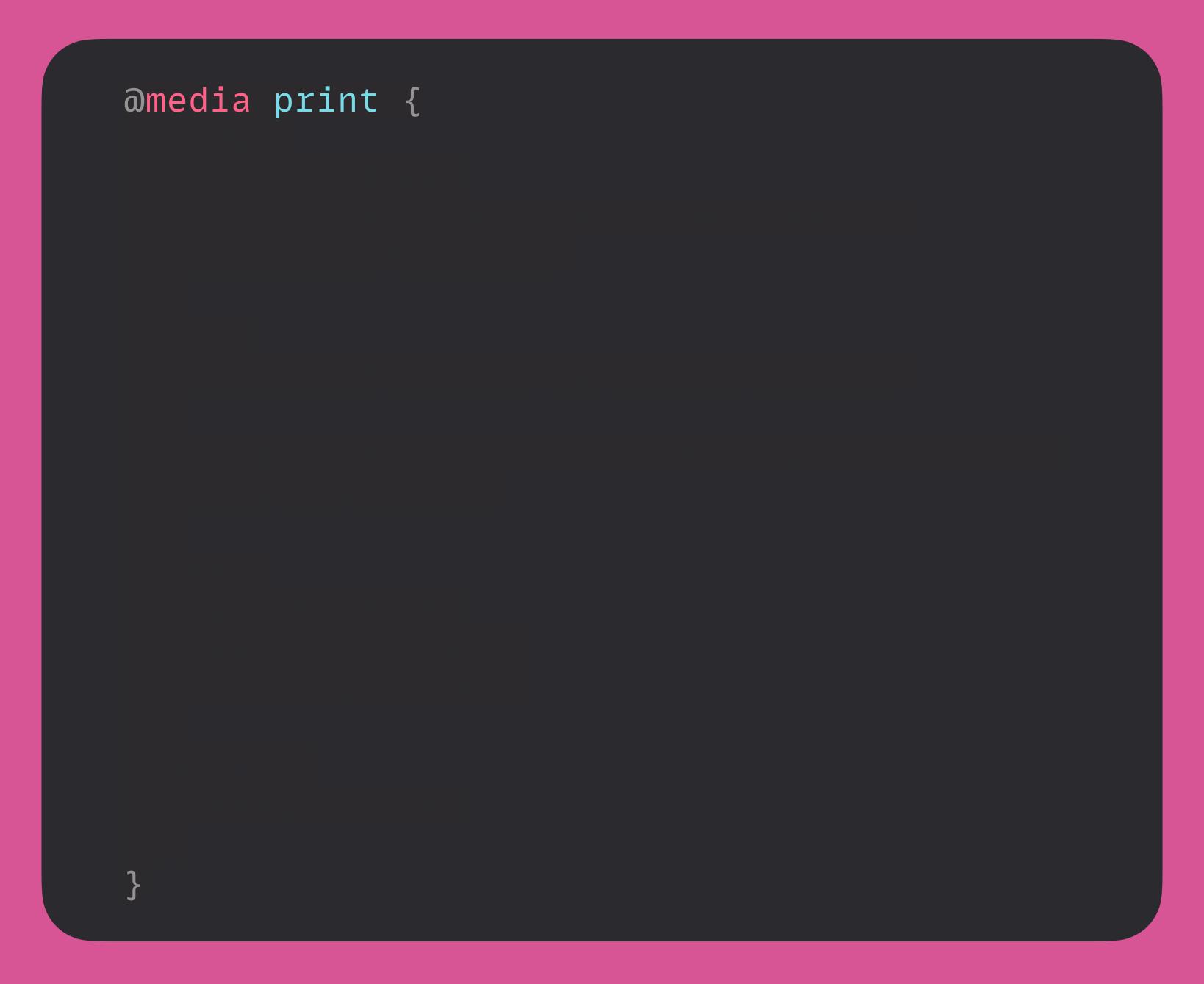


Avengers Endgame Ipsum

When Thanos snapped his fingers, Earth became ground zero for a power surge of ridiculously cosmic proportions. No one's ever seen anything like it... Until two days ago. These are Pym Particles, alright? And ever since Hank Pym got snapped out of existence, this is it. This is what we have. We're not making any more. Now, this may benefit your reality, but my new one...not so much. In this new branched Reality, without our chief weapon against the forces of darkness, our world will be overrun. Millions will suffer. So, tell me, Doctor, can your science prevent all that? Sire, the file appears entangled. It was a memory, but not hers. There's another consciousness sharing her network...another Nebula. I got it. There's another way. To retake the Tesseract and acquire new particles. We'll stroll down memory lane. Military installation, Garden State. Are you sure? - Cap. Captain. Steve, sorry, America. Rogers. Look, if you do this, and this doesn't work, you're not coming back.

You'd love her. Very practical. Only a tiny bit sadistic. Some fuel cells were





```
amedia print {
  body {
    color: #000;
    font: 14pt Georgia, Times, serif;
    line-height: 1.3;
```

```
amedia print {
  body {
    color: #000;
    font: 14pt Georgia, Times, serif;
    line-height: 1.3;
  h1 {
    font: 24pt Georgia, Times, serif;
```

```
amedia print {
  body {
    color: #000;
    font: 14pt Georgia, Times, serif;
    line-height: 1.3;
  h1 {
    font: 24pt Georgia, Times, serif;
  a.logo, header nav, header input, footer {
    display: none;
```

```
amedia print {
  body {
    color: #000;
    font: 14pt Georgia, Times, serif;
    line-height: 1.3;
  h1 {
    font: 24pt Georgia, Times, serif;
  a.logo, header nav, header input, footer {
    display: none;
  img {
    width: 10cm;
    margin: 0 auto;
    display: block;
```

```
amedia print {
  body {
    color: #000;
    font: 14pt Georgia, Times, serif;
    line-height: 1.3;
  h1 {
    font: 24pt Georgia, Times, serif;
  a.logo, header nav, header input, footer {
    display: none;
  img {
    width: 10cm;
    margin: 0 auto;
    display: block;
  apage {
    margin: 1cm;
```

print stylesheet http://127.0.0.1:50001/print/



Avengers Endgame Ipsum

When Thanos snapped his fingers, Earth became ground zero for a power surge of ridiculously cosmic proportions. No one's ever seen anything like it... Until two days ago. These are Pym Particles, alright? And ever since Hank Pym got snapped out of existence, this is it. This is what we have. We're not making any more. Now, this may benefit your reality, but my new one...not so much. In this new branched Reality, without our chief weapon against the forces of darkness, our world will be overrun. Millions will suffer. So, tell me, Doctor, can your science prevent all that? Sire, the file appears entangled. It was a memory, but not hers. There's another consciousness sharing her network...another Nebula. I got it. There's another way. To retake the Tesseract and acquire new particles. We'll stroll down memory lane. Military installation, Garden State. Are you sure? - Cap. Captain. Steve, sorry, America. Rogers. Look, if you do this, and this doesn't work, you're not coming back.

You'd love her. Very practical. Only a tiny bit sadistic. Some fuel cells were cracked during battle, but we figured out a way to reverse the ion charge to buy ourselves about 48 hours of time. We got a shot at getting these stones, but I gotta tell you my priorities: Bring back what we lost? I hope, yes. Keep what I got? I have to, at all costs. And... maybe not die trying will be nice. Will you keep that a little quiet? Didn't bring one for the whole team. We just, wait around for this Quill guy to show up, and then he leads us to the Power Stone, is that it? Sire, the file appears entangled. It was a memory, but not hers. There's another consciousness sharing her network...another Nebula.

I did. For years, I've been treating the Hulk like he's some kind of disease, something to get rid of. But then I started looking at him as the cure. Eighteen months in a gamma lab. I put the brains and the brawn together. And now look at me. Best of both worlds... I don't know why everyone believes that, but that isn't true. Think about it: If you travel to the past, that past becomes your future. And your former present becomes the past. Which can't now be changed by your new future... Oh, there she is. That's Jane... She's... an old flame of mine... She... she stuck her hand inside a rock this one time... and then the Aether stuck itself inside her... And, she became very, very sick. So I had to take her to Asgard, which is where I'm from. And we had to try and fix her. We were dating at the time, you see. I got to introduce her to my Mother... who's dead, Oh, he's gonna answer to us. Odin can have what's left. And I'm gonna need that case, that's been SHIELD property for over 70 years. Nothing. Yet. They're not trying to stop something I'm going to do in our time. They're trying to undo something I've already done in theirs. No amount of money ever bought a second of time. For the last five years I've been trying to do one thing: Get to right here. That's all it's been about. Bringing everybody back.

The universe required correction. After that, the stones served no purpose, beyond temptation. Gotta say, sometimes I miss that giddy optimism. However, high hopes won't help if there's no logical, tangible way for me to safely execute said time heist. I believe the most likely outcome would be our collective demise. I did. For years, I've been treating the Hulk like he's some kind of disease, something to get rid of. But then I started looking at him as the cure. Righteen months in a gamma lab. I put the brains and the brawn together. And now look at me. Best of both worlds... We're good! Get your helmet on, Scott. I'm gonna send you back a week, let you walk around for an hour, then bring you back in 10 seconds. Makes sense? These are Pym Particles, alright? And ever since Hank Pym got snapped out of existence, this is it. This is what we have. We're not making any more. I thought my dad was tough on me. And now, looking back, I just remember the good stuff, you know. He d

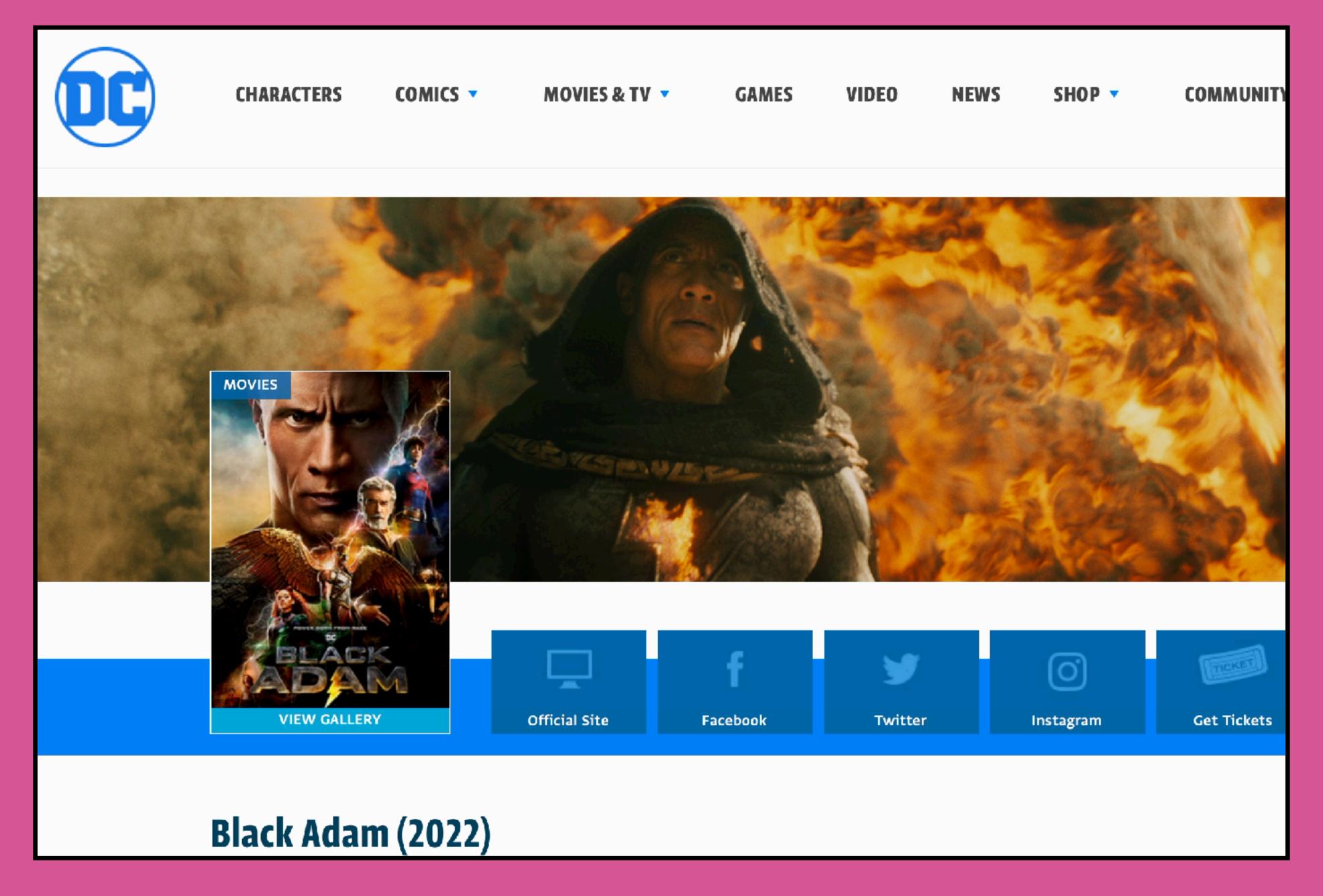
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