

FINESSING FORCED-COLORS:

Tailoring the High Contrast Experience

@soMelanieSaid at TPAC 2019
Web Developer Meetup

Settings

High contrast

Make text and apps easier to see by using more distinct colors.

Use high contrast

Turn on high contrast

☐ Off

Press left Alt + left Shift + Print Screen to turn high contrast on and off.

Choose a theme

High Contrast Black

Select a colored rectangle to customize high contrast colors

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

TAILORED WEB:

ly Honoring Visual Preferences

MelanieSaid at View Source 2019

Settings

High contrast

Make text and apps easier to see by using more distinct colors.

Use high contrast

Turn on high contrast

☒ On

Press left Alt + left Shift + Print Screen to turn high contrast on and off.

Choose a theme

High Contrast Black

Select a colored rectangle to customize high contrast colors

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

TAILORED WEB:

y Honoring Visual Preferences

MelanieSaid at View Source 2019

“The text on the blue
background is kind
of hard to read”

“The text on the blue
background is kind
of hard to read”

Contrast ratio:

1.74:1

“The text on the blue
background is kind
of hard to read”

Contrast ratio:

21:1

“That’s much better!”

Contrast ratio:

21:1



@nkachanovsky on Unsplash



HOW IT WORKS

The style quiz

We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:



SOFT PASTELS



CLASSIC
NEUTRALS



POPS OF WARM
COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?



HOW IT WORKS

The style quiz

We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE



HOW IT WORKS

The style quiz

We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not

You gravitate towards these palettes:

We can tailor our websites to
users' visual needs.

HOW IT WORKS

The style quiz

We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.
You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:

SOFT PASTELS

CLASSIC NEUTRALS

POPS OF WARM COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?


Wardrobe gaps

Next we'll ask some questions to pinpoint what you need more of in your wardrobe, so we're not sending you pieces you already have enough of:


EXAMPLE WARDROBE GAPS

Based on what you told us your wardrobe needs, we'll focus on curating:


BUSINESS CASUAL PIECES



DRESSES



BAGS AND OTHER ACCESSORIES



More about you

And of course, a few more logistical questions to make sure we get it right:

Sizing information

Brands you prefer

How much you prefer to spend on a piece

Set up your service

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

...

Define your aesthetic
with our style quiz!

YOUR NAME

EMAIL ADDRESS

COUNTRY

Please select your country

☐ I agree to such and such terms

Sign up to start quiz



HOW IT WORKS

The style quiz

We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:



SOFT PASTELS



CLASSIC
NEUTRALS



POPS OF WARM
COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?

Wardrobe gaps

Next we'll ask some questions to pinpoint what you need more of in your wardrobe, so we're not sending you pieces you already have enough of:

EXAMPLE WARDROBE GAPS

Based on what you told us your wardrobe needs, we'll focus on curating:

BUSINESS CASUAL PIECES



DRESSES



BAGS AND OTHER ACCESSORIES



More about you

And of course, a few more logistical questions to make sure we get it right:

Sizing information

Brands you prefer

How much you prefer to spend on a piece

Set up your service

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.


...

Define your aesthetic
with our style quiz!

YOUR NAME

EMAIL ADDRESS

COUNTRY

☐ I agree to such and such terms

Sign up to start quiz

A FEW RELATED MEDIA QUERIES

prefers-color-scheme

prefers-contrast

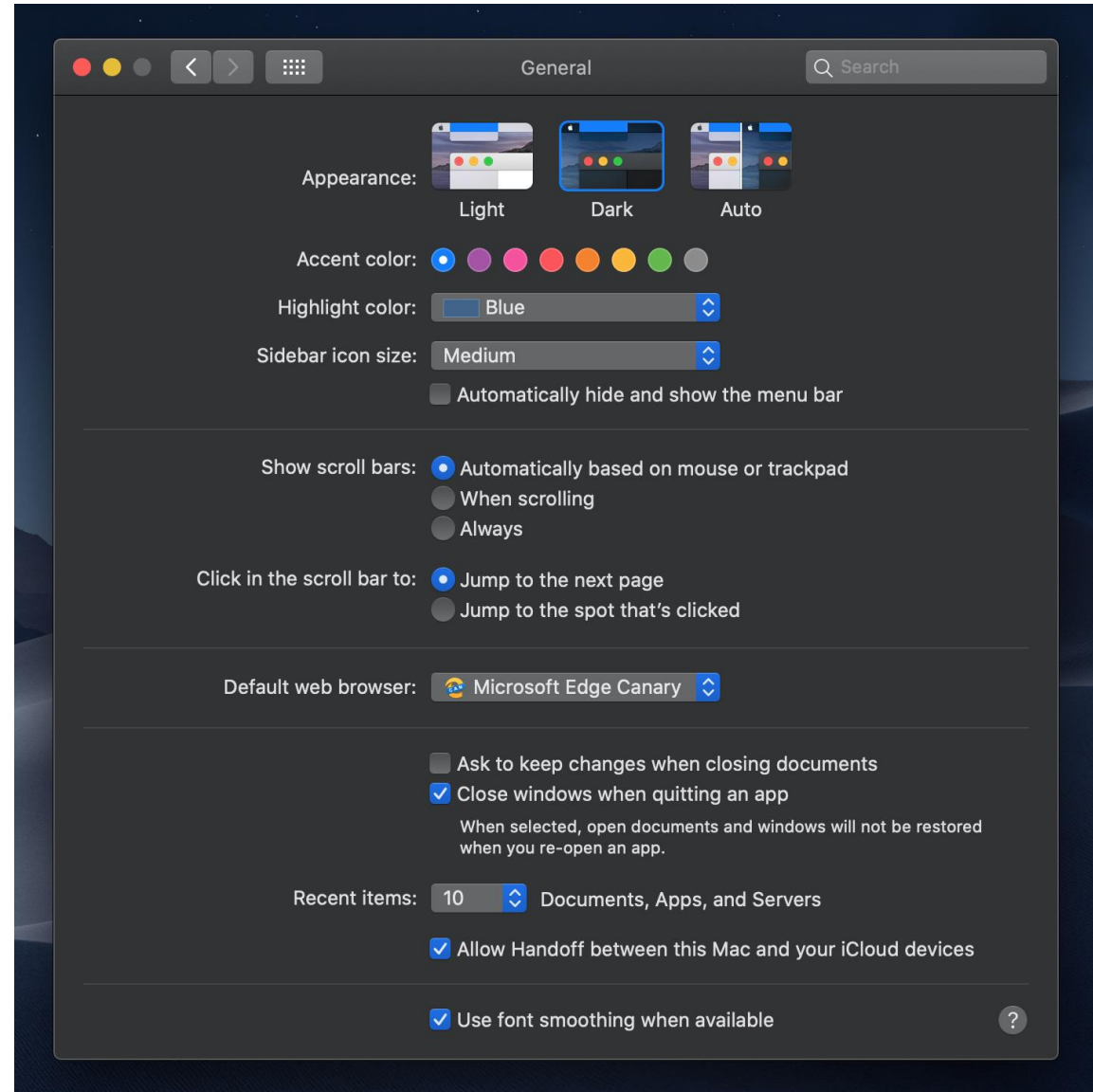
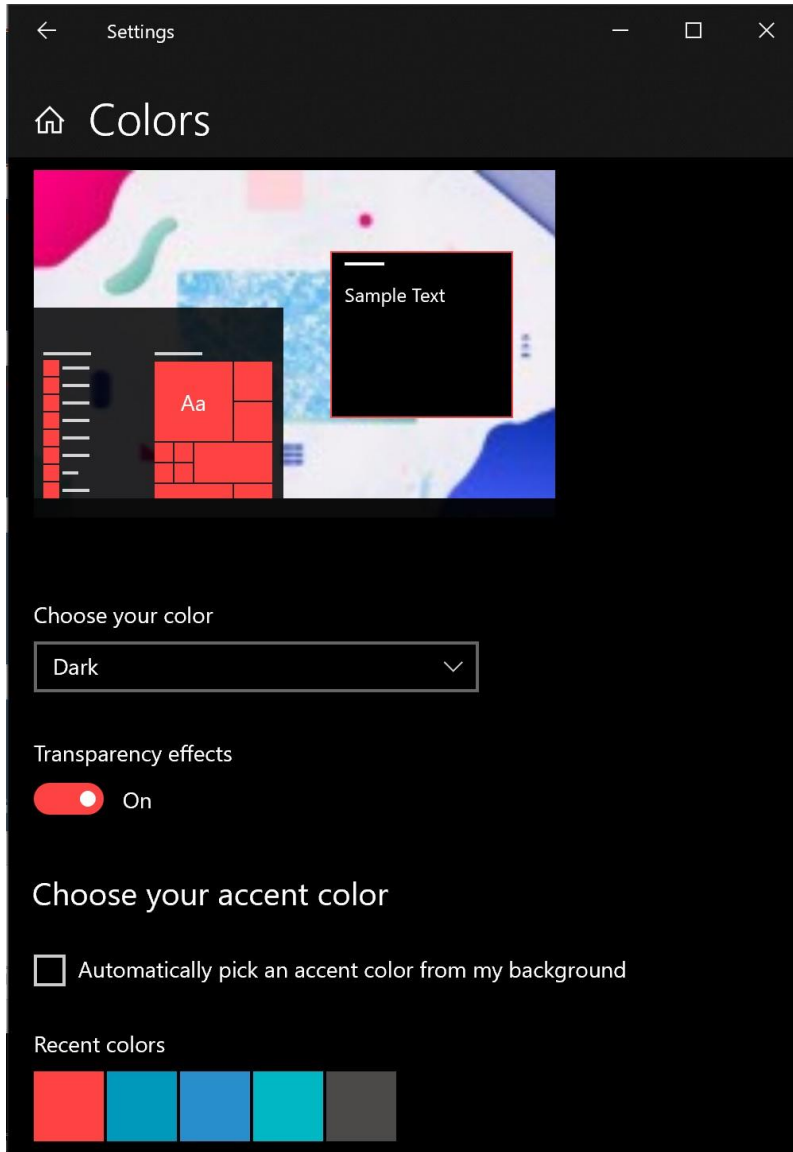
forced-colors

prefers-color-scheme

prefers-contrast

forced-colors

Hint to provide a
particular color
scheme (e.g. dark)



```
@media (prefers-color-scheme: dark) {
  /* “Dark mode” styles */
}
```

HOW IT WORKS

The style quiz


We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences




We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces.

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.
You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:

		
SOFT PASTELS	CLASSIC NEUTRALS	POPS OF WARM COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?


Wardrobe gaps

Next we'll ask some questions to pinpoint what you need more of in your wardrobe, so we're not sending you pieces you already have enough of.


EXAMPLE WARDROBE GAPS

Based on what you told us your wardrobe needs, we'll focus on curating:


BUSINESS CASUAL PIECES



DRESSES



BAGS AND OTHER ACCESSORIES



More about you

And of course, a few more logistical questions to make sure we get it right:

Sizing information

Brands you prefer

How much you prefer to spend on a piece

Set up your service

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

...

Define your aesthetic with
our style quiz!

YOUR NAME

EMAIL ADDRESS

COUNTRY

Please select your country

☒ I agree to such and such terms

[Sign up to start quiz](#)

prefers-color-scheme

prefers-contrast

forced-colors

Hint to increase or
decrease contrast

prefers-color-scheme

prefers-contrast

forced-colors

Hint that content is
rendered in user's
system colors

prefers-color-scheme

prefers-contrast

forced-colors

Expectation:
the website will
fully manage its
own color scheme
and contrast

prefers-color-scheme

prefers-contrast

forced-colors

Expectation:
colors are applied
by the browser; the
website may want
to optimize
its design

FORCED COLORS

Settings

High contrast

Make text and apps easier to see by using more distinct colors.

Use high contrast

Turn on high contrast

☒ On

Press left Alt + left Shift + Print Screen to turn high contrast on and off.

Choose a theme

High Contrast Black

Select a colored rectangle to customize high contrast colors

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

TAILORED WEB:

y Honoring Visual Preferences

MelanieSaid at View Source 2019

Colour & high contrast

High contrast

Choose a theme

TWO

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

Background

Apply

Cancel

Delete

Choose a theme

High Contrast White

Select a colored rectangle to customize high contrast colors

Text

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

Background

Apply

Cancel

Choose a theme

High Contrast #1

Select a colored rectangle to customize high contrast colors

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

Hyperlinks

Disabled Text

Selected Text

Button Text

Background

Apply

Cancel

Choose a theme

Softer warm theme

Select a colored rectangle to customize high contrast colors

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

Background

How browsers apply forced colors to web content

Settings

High contrast

Make text and apps easier to see by using more distinct colors.

Use high contrast

Turn on high contrast

☒ On

Press left Alt + left Shift + Print Screen to turn high contrast on and off.

Choose a theme

High Contrast Black

Select a colored rectangle to customize high contrast colors

Text

Hyperlinks

Disabled Text

Selected Text

Button Text

TAILORED WEB:

y Honoring Visual Preferences

MelanieSaid at View Source 2019



HOW IT WORKS

The style quiz

We want to make sure we send you only pieces you'll love. That's why we start with a style quiz to help you define your aesthetic. The quiz has a few sections:

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not

You gravitate towards these palettes:

afraid to mix in a clean line or a [vegan] leather jacket.



SOFT PASTELS

CLASSIC
NEUTRALS

POPS OF WARM
COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticate**, so why not try mixing in a bolder heel or tailored blazer?

Wardrobe gaps

Next we'll ask some questions to pinpoint what you need more of in your wardrobe, so we're not sending you pieces you already have enough of:

EXAMPLE WARDROBE GAPS

Based on what you told us your wardrobe needs, we'll focus on curating:

BUSINESS CASUAL PIECES

DRESSES

BAGS AND OTHER ACCESSORIES



More about you

And of course, a few more logistical questions to make sure we get it right:

Sizing information

Brands you prefer

How much you prefer to spend on a piece

Set up your service

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud

exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

...

Define your aesthetic with
our style quiz!

YOUR NAME

EMAIL ADDRESS

COUNTRY

☐ I agree to such and such terms

Sign up to start quiz

Reverted properties

color

fill

stroke

text-decoration-color

text-emphasis-color

background-color

border-color

outline-color

column-rule-color

scrollbar-color

-webkit-tap-highlight-color

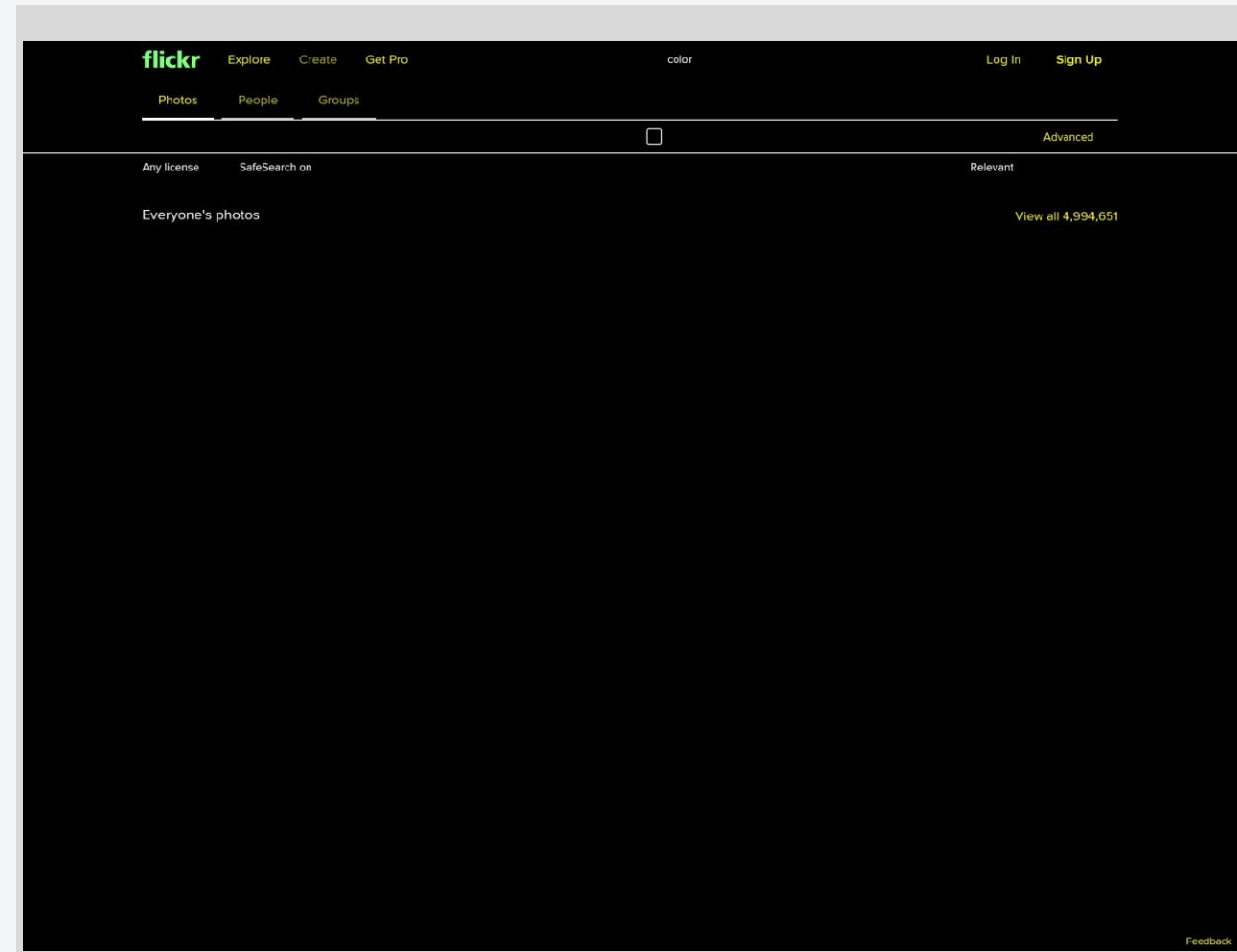
box-shadow

text-shadow

background-image (only on user
interactive controls, excluding
buttons)

Why not globally revert background-image?

Many developers use this property to display “content” images



Text backplates guarantee legibility

Wardrobe gaps

Next we'll ask some questions to pinpoint what you need more of in your wardrobe, so we're not sending you pieces you already have enough of:

WARDROBE GAPS

What you told us your wardrobe needs, we'll focus on curating:

CASUAL PIECES



DRESSES



BAGS AND OTHER ACCESSORIES



More about you

Color schemes in forced color modes

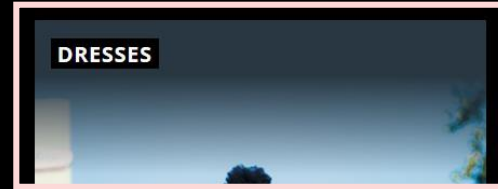
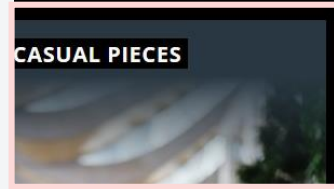
prefers-color-scheme
evaluates appropriately
based on Canvas color
(page background)

Wardrobe gaps

Next we'll ask some questions to pinpoint what you need more of in your wardrobe, so we're not sending you pieces you already have enough of:

WARDROBE GAPS

What you told us your wardrobe needs, we'll focus on curating:



More about you

Web devs can apply content-specific knowledge to tailor the forced colors experience.

SVGs are not modified...mostly

Only SVG `<text>` and `<foreignObject>` have forced colors applied for legibility



Contoso Closet

HOW IT

The style quiz

We want to make sure we send you only p
a style quiz to help you define your aesthe

Aesthetic preferences

We'll ask you what you think of some outfi
style profile that will guide how we curate

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not

currentColor

```
.header__brand-icon * {  
  stroke:  
  currentColor;  
}
```

```
.header__c-glyph {  
  fill: currentColor;  
}
```



Contoso Closet

HOW IT

The style quiz

We want to make sure we send you only p
a style quiz to help you define your aesthe

Aesthetic preferences

We'll ask you what you think of some outfi
style profile that will guide how we curate

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:

SOFT PASTELS

CLASSIC
NEUTRALS

POPS OF WARM
COLOR

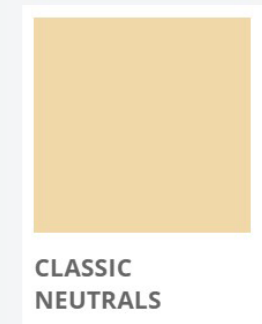
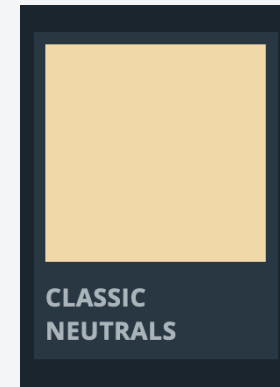
You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?

Component requirements

1. Retain the color swatch
2. Prevent swatch rendering on top of any given background color (muddy?)
3. Preserve the user's color scheme for text legibility



Prior art: media query syntax

```
@media (-ms-high-contrast: active) {}
```

Values:

```
none (IE and early MS Edge) | active | black-  
on-white | white-on-black
```

Standard media query syntax

```
@media (-ms-high-contrast: active),  
       (forced-colors: active) {}
```

Values:

none | active

Prior art: opt out of forced colors

```
@media (-ms-high-contrast: active) {  
    .prefs__palette {  
        -ms-high-contrast-adjust: none;  
    }  
    ...  
}
```

Opt out of forced colors

```
@media (-ms-high-contrast: active),  
(forced-colors: active) {  
  
    .prefs__palette {  
        -ms-high-contrast-adjust: none;  
        forced-color-adjust: none;  
    }  
}
```

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

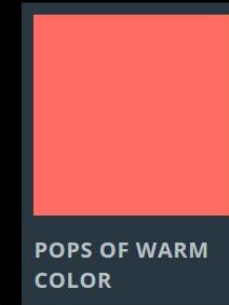
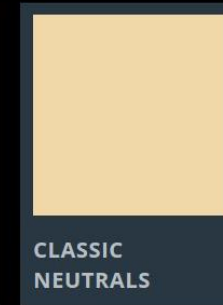
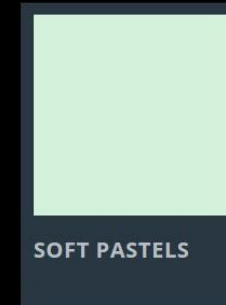
EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:



You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?

Be careful with static colors

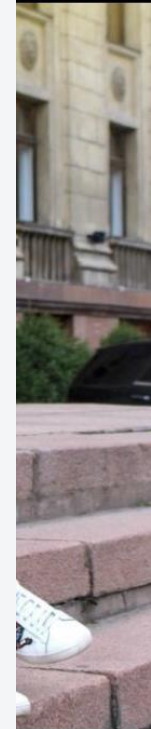
```
.prefs__palette {  
  forced-color-adjust:  
  none;  
  background-color: #000;  
}
```

ces

Look at some outfits and style elements, then generate a
how we curate your pieces:

nine.

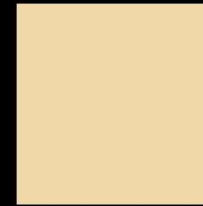
It's not
t you're not
cket.



You gravitate towards these palettes:



SOFT PASTELS



CLASSIC
NEUTRALS



POPS OF WARM
COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try
mixing in a bolder heel or tailored blazer?

Static color values are unaware of the user scheme

ces

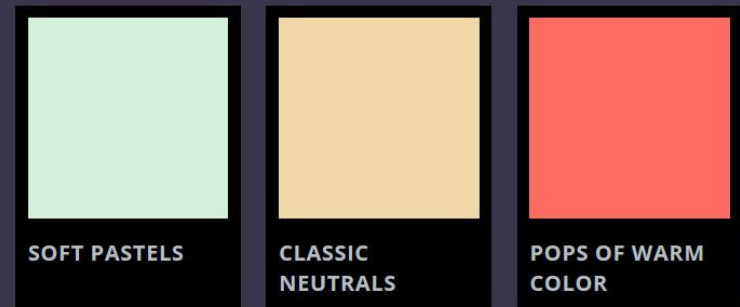
...k of some outfits and style elements, then generate a
...how we curate your pieces:

nine.

...t you're not
...cket.



You gravitate towards these palettes:



You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?

Use appropriate system colors

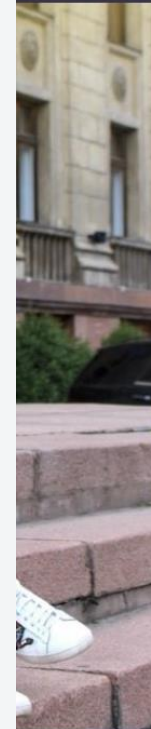
```
.c-label {  
  padding: .25em;  
  background-color:  
    Canvas;  
  color: Text;  
}
```

ces

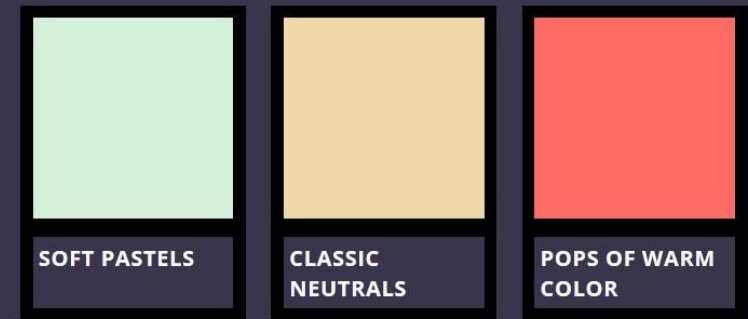
ick of some outfits and style elements, then generate a
how we curate your pieces:

nine.

at you're not
cket.



You gravitate towards these palettes:



You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticate**, so why not try mixing in a bolder heel or tailored blazer?

CSS system colors relevant to Windows High Contrast

High Contrast Theme Color	CSS System Color	Prior System Colors
Text	Text	WindowText
Hyperlinks	LinkText	-ms-hotlight (IE and MS Edge only)
Disabled Text	GrayText	
Selected Text	HighlightText (foreground), Highlight (background)	
Button Text	ButtonText (foreground), ButtonFace (background)	
Background	Canvas	Window

Full list of system colors on CSS Color Editor's Draft

aka.ms/
system-colors-draft

§ 6.2. CSS System Colors

In addition to being able to assign color keyword values to text, backgrounds, etc., CSS defines a set of '`<system-color>`' values, to allow authors to specify colors in a manner that integrate them into the user's graphic environment.

`<system-color>`s incur some privacy and security risk, as detailed in [§ 17 Security and Privacy Considerations](#).

For systems that do not have a corresponding value, the specified value should be mapped to the nearest system color value, or to a default color. Note that some profiles of CSS may not support System Colors at all.

The following lists the additional values for color-related CSS values and their general meaning. Any color property can take one of the following names. These names are case-insensitive and shown here with mixed capitalization for legibility.

'ActiveText'

Text in active links.

'ButtonFace'

The face background color for push buttons.

'ButtonText'

Text on push buttons.

'Canvas'

Background of application content or documents.

'Field'

Background of input fields.

'FieldText'

Text in input fields.

'GrayText'

Grayed (disabled) text. This color is set to #000 if the current display driver does not support a solid gray color.

'Highlight'

Background of item(s) selected in a control.

'HighlightText'

Text of item(s) selected in a control.

'LinkText'

Text in non-active, non-visited links.

'Text'

Text in application content or documents.

'VisitedText'

Text in visited links.

Earlier versions of CSS defined additional `<system-color>`s, which have since been deprecated. These are documented in [Appendix A: Deprecated CSS System Colors](#).

Optimize for dark / light forced colors

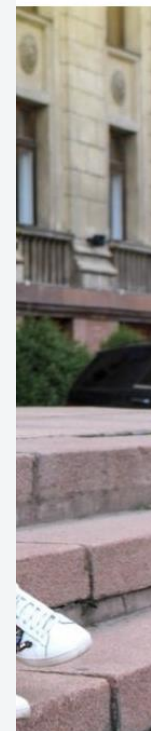
```
@media (forced-colors: active)
and (prefers-color-scheme: light){
  .prefs__palette {
    background: #fff;
  }
}
```

ces

of some outfits and style elements, then generate a
how we curate your pieces:

nine.

t you're not
cket.



You gravitate towards these palettes:



SOFT PASTELS



CLASSIC
NEUTRALS



POPS OF WARM
COLOR

You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticated**, so why not try mixing in a bolder heel or tailored blazer?

Instead of removing styles...

```
button {  
    border: 0;  
}
```

adipiscing elit, sed do eiusmod tempor
a. Ut enim ad minim veniam, quis nostrud
ex ea commodo consequat.

YOUR NAME

EMAIL ADDRESS

COUNTRY

☐ I agree to such and such terms

Sign up to start quiz

...consider transparency

```
button {  
    border: 1px solid  
    transparent;  
}
```

adipiscing elit, sed do eiusmod tempor
a. Ut enim ad minim veniam, quis nostrud
ex ea commodo consequat.

YOUR NAME

EMAIL ADDRESS

COUNTRY

☐ I agree to such and such terms

Sign up to start quiz

Browser support for forced colors (desktop)

Vendor-prefixed styling



New standards



In development behind a flag
in the Chromium project

Testing without a Windows machine?

Virtual Machines:
aka.ms/web-vms

Aesthetic preferences

We'll ask you what you think of some outfits and style elements, then generate a style profile that will guide how we curate your pieces:

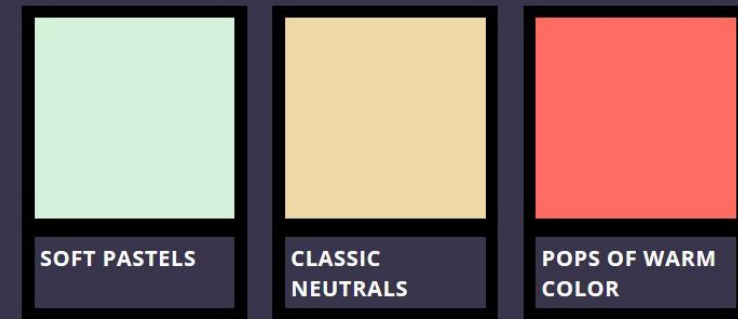
EXAMPLE STYLE PROFILE

Your key aesthetic is **modern feminine**.

You appreciate flowing fabrics and soft details, but you're not afraid to mix in a clean line or a [vegan] leather jacket.



You gravitate towards these palettes:



You also enjoy:

- Classic prints, such as polka dots or florals
- Perfectly paired accessories
- Unique scarves for warm and cool weather

Your second-closest style is **chic sophisticate**, so why not try mixing in a bolder heel or tailored blazer?

THANK YOU!

Slides, demo, and more:
aka.ms/tpac-hc