

Color Your Experience: Crafting Appealing Themes Using SAS® Theme Designer

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ABSTRACT

SAS® Theme Designer provides customers with a powerful set of options for customizing SAS® application and report themes. Apply sweeping changes to your theme with ease by leveraging the structure of SAS themes, and then override key features to refine the look. Strike the right color balance by mapping your brand palette to theme variables that are intelligently applied across the software. Create complimentary application and report themes to unite your interface controls and data visualizations. Preview your theme on a set of general controls within SAS Theme Designer. This paper explores best practices for optimizing a custom look and feel that reflects your brand and that provides a great experience for your users.

INTRODUCTION

Administrators can use SAS® Theme Designer to customize the look of SAS products for all of their users. SAS provides 4 base themes; each of these can be customized with your color palette and logo to make your SAS products feel like your own. With just a few decisions, you can create a quick theme that matches your brand. For a truly custom look, there are lots of overrides for ui component level control in addition to report themes. We'll explore best practices for using your brand palette to achieve a pleasing, usable look and feel.

THEME STRUCTURE AND STYLE OPTIONS

Creating a custom theme using SAS Theme Designer can be done quickly and easily using global properties to apply sweeping changes. Our themes are created with an underlying structure based on generated palettes and derived colors. SAS Theme Designer provides access to the top-level variables that feed the look and feel of SAS software. To see your company colors throughout any theme, simply update the Global styles for both interface elements and graphs.

In addition to getting the overall theme showing the right color palette, we recognize that some components may need individual customization. Whether it's to show a brand color prominently in the banner, or to make tables match the look you use in other software or documents, we offer overrides for a select set of components.

GLOBAL INTERFACE STYLES

Most of the software's appearance is controlled by the Interface Styles. This part of the theme sets the colors and font used throughout the interface.

Base theme

Base theme is a new feature that will be available in SAS Theme Designer 5.1 on SAS 9.4. (Look for the Base theme setting for SAS Theme Designer on Viya in an upcoming release.) When you create a new theme, you will choose which application or report theme to use as a starting point. Each theme has a different feel, based on how the color is applied across

the different interface elements. The base theme you chose will be reflected in the base theme setting.

After you've customized colors within your theme, it's easy to see how your selections would look in a different base theme by changing the base theme setting.

In case you want to start again with a clean slate, we've included an option to reset the color and font choices to the defaults for the selected base theme.

Primary

The primary color sets the tone for the theme. Often it is appropriate to use your primary brand color here to make it a prominent aspect of the theme.

Secondary

The secondary color is used to mark active or selected parts of the interface. The color assigned to secondary should contrast with the primary and neutral colors in a way that will stand out.

Neutral

The neutral color is used for elements like text, outlines, and color fields that differentiate areas of the screen. And it's used to color axis and text elements in graphs, such as axis lines, tick values, axis labels, and grid lines. Keeping the neutral color as a fairly low saturation hue with help maintain the visual hierarchy of the theme.

Message colors

We color messages throughout our software based on the importance and type of message.

The information color should suggest that all is well and that the message is simply helpful information

The success color is used to provide confirmation of successful actions or processes.

Warning denotes that care should be taken with a setting or action, or that there is a possibility of something going wrong.

Alert indicates information that needs attention or that something has gone wrong.

Base theme:

Illuminate ▼

Reset to base theme defaults

Branding

Primary: ⓘ



Secondary: ⓘ



Neutral: ⓘ



Base font:

Avenir Next ▼

16 ▼

Messages

Information:



Success:



Warning:



Alert:



Figure 1. Global interface style options

GLOBAL GRAPH STYLES

Data palette

The data palette defines most of the colors that are used to encode data in the graphs. The palette is used directly as the fill color for shapes, such as the rectangles in a bar chart or the circles in a bubble plot. They are used to create slightly higher contrast versions of each color to use on finer elements such as lines and markers. We use them to define gradients for encoding continuous data. And we derive versions of each color to use in node styles that provide a color encoded background for node link diagrams.



Figure 2. Global graph style options

Gauge palette

The gauge palette is used to capture KPI colors that are used in our gauges, as well as other encoding cases that require positive or negative semantics, such as increasing or decreasing bars in a waterfall chart.

PROPERTY OVERRIDES

In addition to getting the overall theme showing the right color palette, we recognize that some components may need customization. Whether it's to show a brand color prominently in the banner, or to make our table match the look you use in other software, we offer overrides for a select set of components.

Banner

The background and text/icon colors can be customized, and optionally, you can add a logo to the banner.

Initial Loading Screen and Transition Screen

You can change the page background and the loading animation for both the initial loading screen as well as the transition screen that appears while switching applications. The ability to substitute the loading animation provides another opportunity to add brand specific content.

Table

Each area of the table can be customized separately, allowing headers, cells and total rows their own background and text colors.

Crosstab

Each area of the crosstab can be customized separately, allowing the column headers, row headers, measure headers, cells and total rows to have their own background and text colors.

STRIKE THE RIGHT COLOR BALANCE

The key to a beautifully branded interface is carefully considering how to apply your colors. A well thought out color palette can take your user's experience with the software from "good" to "great" while a poorly planned theme can detract from the overall experience and even interfere with their ability to use the software. There are a few steps in deciding how best to apply your colors to the theme.

First, you need to assess your palette. Most brands have a dominant color and one or more supporting colors. What is your main brand color? Do you have a secondary color? What supporting colors are often used (these are generally neutral values, like gray or beiges)? Each combination of colors needs to be considered differently. Cool colors like blues, teals, and greens can be used in larger quantities than bright bold colors such as oranges and reds.

Here's a quick guide on the best way to use different colors in your application theme:

1. **Red** is a very strong color and can overwhelm other visual elements in the user interface. Red is best used in smaller areas within the UI as an accent and/or color. Lightening it to pink or darkening it to maroon makes it easier on the eyes. This can also make it feel more playful or traditional.
2. **Orange** is a visually dominant color that's best used as an accent. It draws the eye and works well on buttons or other elements that you want users to notice.
3. **Yellow** is happy and cheerful but can pose problems with readability. More pastel yellows can be considered for a neutral color while brighter yellows and golds may feel best for accent and/or banner colors. Stray away from yellow for text.
4. Light or lime **greens** can be a nice accent color while dark greens can work well as a primary color.
5. **Blue** is the most universally liked color and can be used in many different ways in a theme, depending on the feeling you want.
6. **Purple** is a punchy color and can work well on the banner or as an accent color. A deep eggplant could work well as a primary color in a dark theme.
7. **Gray** is a nice neutral color that can be sophisticated. It pairs well with most other colors and could even be considered for the primary color in a dark theme.
8. **Brown** is a neutral color that is best used as a banner or accent color. Large quantities of it can convey an earthy feel.

Second, choose one of our themes to start with. In the design department at SAS, we have a dedicated team who assesses how to best apply our Brand colors to our software. Our main brand color is blue and its often paired with black, white, and gray. We've combined these in 3 different ways to create our 3 base application themes, Ignite, Illuminate, and Inspire.

Here are our application themes:

1. **Illuminate** is our brightest theme. Beginning with this base will deliver a clean, modern, fresh feel to your UI.
2. **Inspire** is a hybrid theme, meaning it balances dark areas with light content areas. Using this theme, will give users heavy amounts of a primary color while also keeping the area of focus light and bright.
3. **Ignite** is our dark theme. Using this theme will deliver a deep UI, that allows graphs visualizations and other elements to pop.

In addition, we have several report themes, that vary from release to release. For the

upcoming release of SAS Theme Designer 5.1 on SAS 9.4, we will have a report theme to match each application theme plus a couple more. Though the ideas presented below refer to application base themes, the same kind of customizations can be achieved for report themes.

In addition, it's easy to create a coordinating report theme after you've arrived at an application theme that suits your needs. Using the copy feature at the top right corner of file list, you can copy your application theme and specify that the copy be a report theme instead.

Our report themes for SAS Theme Designer 5.1:

1. **Marine** coordinates with Illuminate, sharing a bright look and feel.
2. **Aqua** coordinates with Inspire, featuring its light content area styling.
3. **Midnight** works with Ignite, with dark canvas areas and bright foreground content.
4. **Opal** offers a new bright graph palette and modern feel.
5. **Snow, Light, and Dark** carry forward a translation of the report themes of the same names from Flex.

It's also important to note that SAS offers both a **High Contrast** application and report theme designed to make our software more accessible to people with a visual impairments. You can create customized versions of high contrast themes using SAS Theme Designer, but the use of high contrast as base for custom themes is not yet fully featured and is considered pre-production in our next release.

CRAFTING YOUR THEME

It's easy to completely change the visual appearance a theme with just few global colors selections. Depending on the colors you are working with, likely coming from a palette of colors used in your brand, there are a variety of strategies available to create compelling and easy to use themes. We offer ideas for a few different approaches to including colors from your brand, depending the type and quantity of colors you want to feature.

MULTI-COLOR THEMES

Some brands have multiple colors that make up their look and feel. It can be challenging to incorporate all of the colors, without distracting from the content of your application. There are a few ways to approach this problem, using the base themes and some overrides in SAS Theme Designer.

This sample palette uses red, orange, blue, and yellow.



Concentrate on One Color

One approach can be to concentrate on one color. Here we've used the blue as the primary color and incorporated all the colors into the graph data palette as the basis for an assertive primary colored scheme.

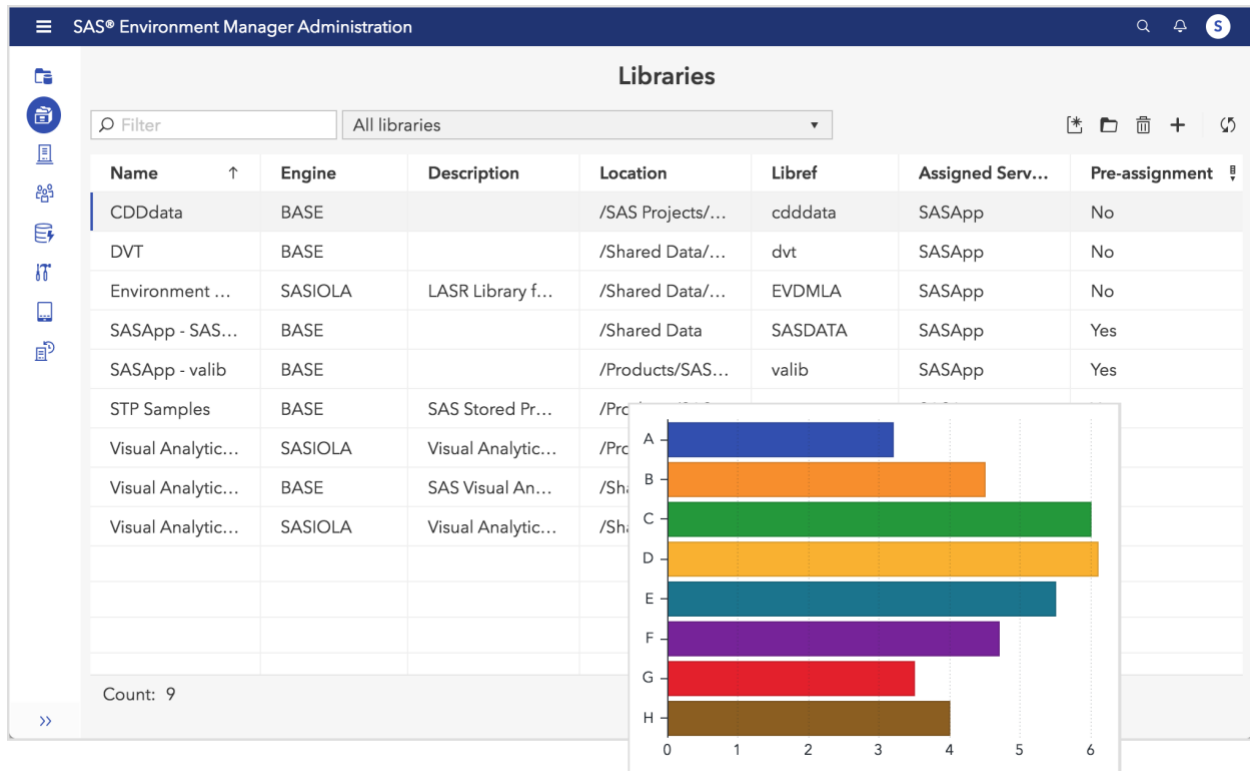


Figure 3. Choosing one brand color to highlight can keep the interface cohesive and minimal

Base Theme: Illuminate

Customizations:

Interface Styles

- Global > Primary: Set to brand blue
- Global > Secondary: Set to brand blue

Graphs Styles

- Data palette > Color 1: Set to brand blue
- Data palette > Color 2: Set to brand orange
- Data palette > Color 3: Set to green
- Data palette > Color 4: Set to brand yellow
- Data palette > Color 5: Set to teal
- Data palette > Color 6: Set to purple
- Data palette > Color 7: Set to brand red
- Data palette > Color 8: Set to brown

Use Small Pops of Color

To include more colors without overwhelming the content of the interface, add small bits of color here and there. Setting the secondary color and taking advantage of a few strategic overrides will achieve this look.

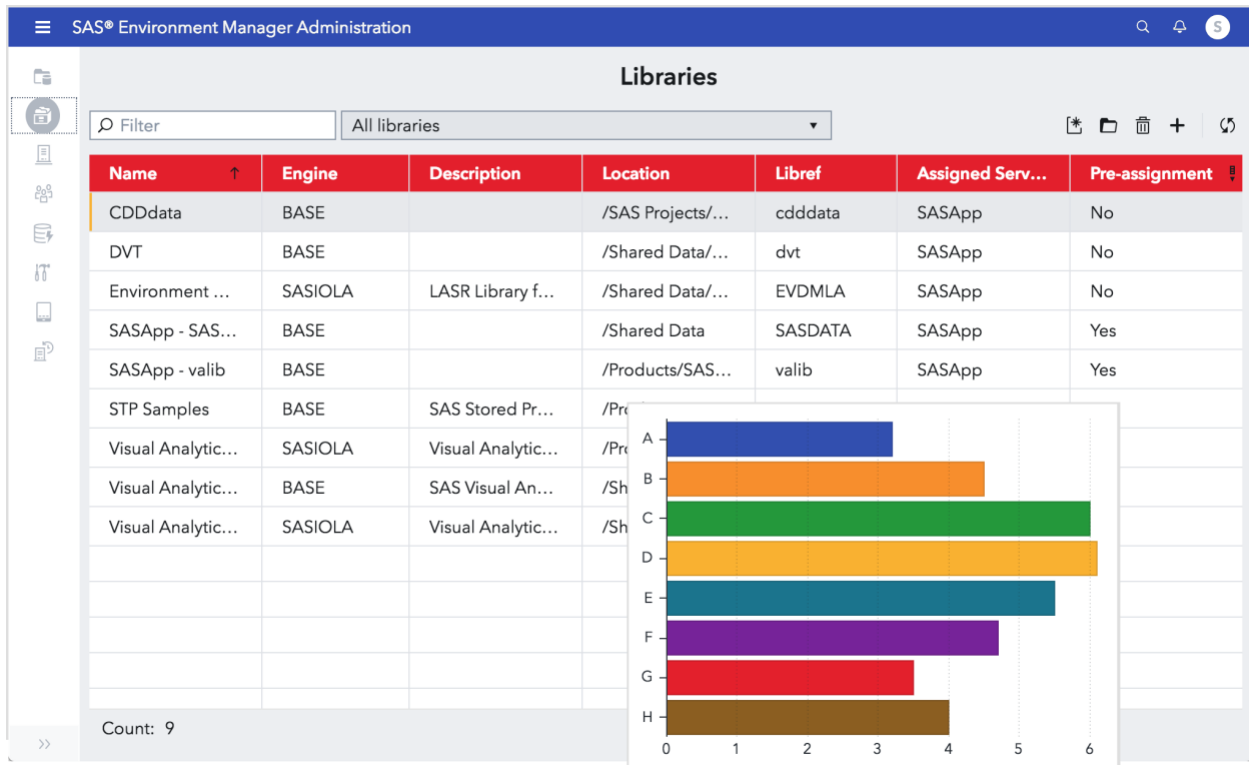


Figure 4. For a colorful interface, include pops of many different brand colors

Base Theme: Illuminate

Customizations:

Interface Styles

- Global > Primary: Set to a medium gray
- Global > Secondary: Set to yellow
- Overrides > Banner > Background: Set to blue
- Overrides > Initial Loading Screen > Spinner color: Set to orange
- Overrides > Transition Screen > Spinner color: Set to orange
- Overrides > Tables > Header > Background color: Set to red

Use One Color to Amplify the Others

If you have a color in your palette that works well as a background palette, you can use Ignite to create a base for all your other colors. Here I used the brand blue as the canvas on which to display bright accent colors and a vibrant graph palette that includes the entire brand palette.

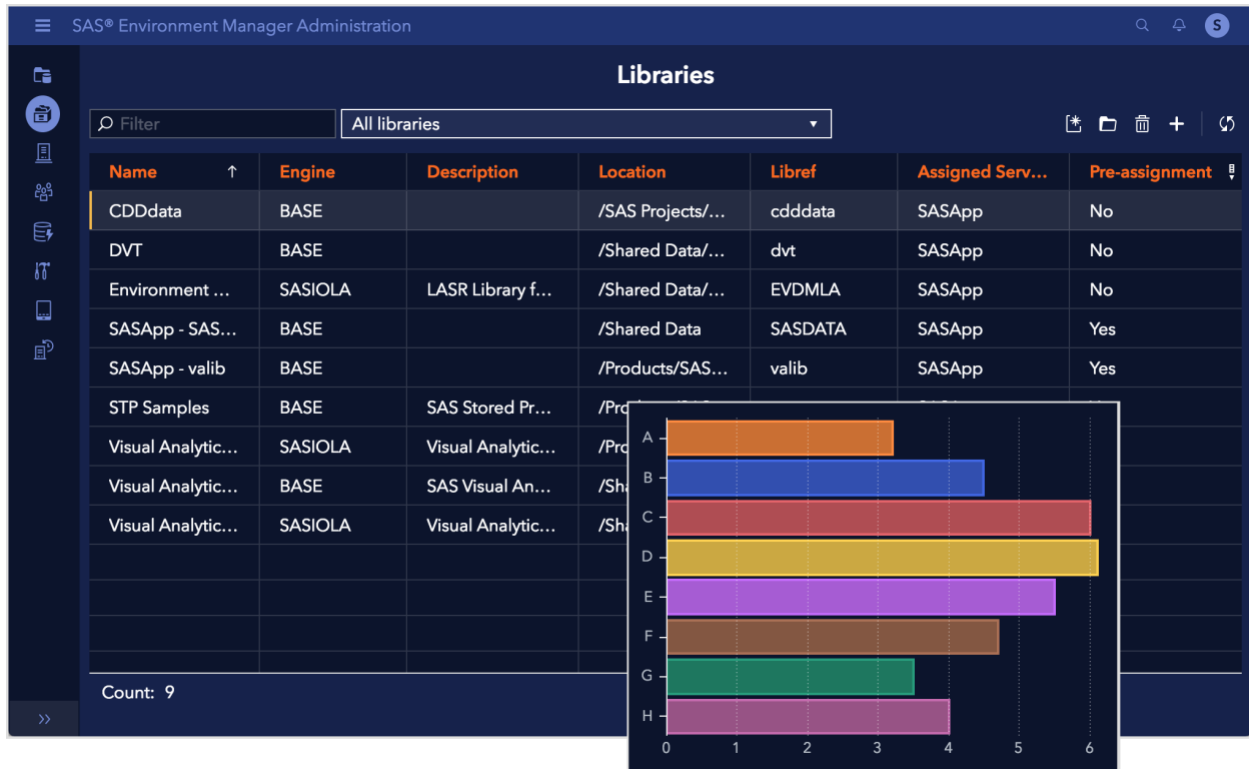


Figure 5. Using one of the dark brand colors as backdrop can showcase the rest of the palette

Base Theme: Ignite

Customizations:

Interface Styles

- Global > Primary: Set to blue
- Global > Secondary: Set to yellow
- Overrides > Tables > Header > Text color: Set to orange

Graphs Styles

- Data palette > Tweaked the colors that were already specified for Ignite to more closely match the hues in our brand palette while keeping that same look

THEMES WITH ONE DOMINANT COLOR

Often brands have one main color. This is the case for SAS, with our blue. However, the main color can be a dominant color, like red, that is jarring when used in heavy quantities. Here are a few ways to incorporate red as the brand color.

First, we've created a palette that uses red but also adds some additional neutral colors.



Disperse the Color

Your brand color can have more impact when its used sparingly throughout the interface. This approach uses a soft neutral palette to let the brand red stand out within the content areas of the application. By adding red to several specific areas but practicing restraint in the banner and primary colors, the interface feels modern and bright.

Name	Engine	Description	Location	Libref	Assigned Serv...	Pre-assignment
CDDdata	BASE		/SAS Projects/...	cdddata	SASApp	No
DVT	BASE		/Shared Data/...	dvt	SASApp	No
Environment ...	SASIOLA	LASR Library f...	/Shared Data/...	EVDMLA	SASApp	No
SASApp - SAS...	BASE		/Shared Data	SASDATA	SASApp	Yes
SASApp - valib	BASE		/Products/SAS...	valib	SASApp	Yes
STP Samples	BASE	SAS Stored Pr...	/Pro...			
Visual Analytic...	SASIOLA	Visual Analytic...	/Pro...			
Visual Analytic...	BASE	SAS Visual An...	/Sh...			
Visual Analytic...	SASIOLA	Visual Analytic...	/Sh...			

Category	Value
A	3.2
B	4.5
C	5.8
D	6.0
E	5.5
F	4.8
G	3.5
H	4.0

Base Theme: Illuminate

Customizations:

Interface Styles

- Global > Primary: Set to deep gray
- Global > Secondary: Set to brand color

- Overrides > Tables > Header> Background color: Set to light version of brand color

Graphs Styles

- Data palette > Tweaked the colors that were already specified for Illuminate to more closely match the vibrancy in our brand red

Deepen to Neutral

Even bright brand colors can become neutral when darkened or lightened enough. This is one way to incorporate large amounts of the color, that would be too much at its default value. To help maintain the character of the original brand color, it can be used in small areas as an accent color. This creates a sense of depth in the palette.

The screenshot shows the SAS Environment Manager Administration interface. The main content is a table titled "Libraries" with columns: Name, Engine, Description, Location, Libref, Assigned Serv..., and Pre-assignment. The table lists several libraries, including CDDdata, DVT, Environment..., SASApp - SAS..., SASApp - valib, STP Samples, and Visual Analytic... The interface also features a search bar, a filter dropdown, and a sidebar with navigation icons. A data palette overlay is visible in the foreground, showing a horizontal bar chart with eight bars labeled A through H, each with a different color: A (red), B (yellow), C (blue), D (orange), E (cyan), F (pink), G (green), and H (magenta). The x-axis of the chart ranges from 0 to 6.

Name	Engine	Description	Location	Libref	Assigned Serv...	Pre-assignment
CDDdata	BASE		/SAS Projects/...	cdldata	SASApp	No
DVT	BASE		/Shared Data/...	dvt	SASApp	No
Environment ...	SASIOLA	LASR Library f...	/Shared Data/...	EVDMLA	SASApp	No
SASApp - SAS...	BASE		/Shared Data	SASDATA	SASApp	Yes
SASApp - valib	BASE		/Products/SAS...	valib	SASApp	Yes
STP Samples	BASE	SAS Stored Pr...	/Pro...			
Visual Analytic...	SASIOLA	Visual Analytic...	/Pro...			
Visual Analytic...	BASE	SAS Visual An...	/Sh...			
Visual Analytic...	SASIOLA	Visual Analytic...	/Sh...			

Base Theme: Ignite

Customizations:

Interface Styles

- Global > Primary: Set to deepened hue of brand color
- Global > Secondary: Set to Black
- Overrides > Banner > Background: Set to black
- ~~Overrides > Banner > Text: Set to brand color~~
- Overrides > Initial Loading Screen > Spinner color: Set to brand color
- Overrides > Transition Screen > Spinner color: Set to brand color
- Overrides > Tables > Header> Background color: Set to light version of brand color

Graphs Styles

- Data palette > Tweaked the colors that were already specified for Ignite to more closely match the vibrancy in our brand red

Concentrated Use of Color

Adding red to the banner and navigation areas is easily done, using our Illuminate theme as a base. Keep the neutral and accent colors as blacks and grays, allows these global elements to shine. A tweaked graph palette keeps everything feeling vibrant and cohesive.

The screenshot shows the SAS Environment Manager Administration interface. The main content area displays a table titled "Libraries" with columns: Name, Engine, Description, Location, Libref, Assigned Serv..., and Pre-assignment. The table lists several libraries, including CDDdata, DVT, Environment..., SASApp - SAS..., SASApp - valib, STP Samples, and Visual Analytic... The interface also features a search bar, a filter dropdown, and a sidebar with navigation icons. A horizontal bar chart is overlaid on the bottom right of the table, showing data for categories A through H. The chart uses a vibrant color palette: A (red), B (cyan), C (orange), D (green), E (blue), F (yellow), G (magenta), and H (olive). The x-axis ranges from 0 to 6.

Category	Value
A	3.2
B	4.5
C	5.8
D	6.2
E	5.5
F	4.8
G	3.5
H	4.0

Base Theme: Illuminate

Customizations:

Interface Styles

- Global > Primary: Set to brand color
- Global > Secondary: Set to a deep gray

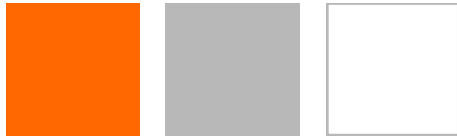
Graphs Styles

- Data palette > Tweaked the colors that were already specified for Illuminate to more closely match the vibrancy in our brand red

THEMES USING A TRICKY BRAND COLOR

Sometimes brands have an eye-catching color that is difficult to incorporate into the UI. For example, it may pose problems to legibility or it may turn into unfavorable colors when lightened or darkened within the theme hierarchy. There are still ways to use this brand color, while maintaining balance and legibility in the UI.

In this sample palette, we've chosen orange as our brand color. Orange is a dominant, eye catching color, that turns muddy when darkened or pink when lightened. However, it can feel modern and bright when incorporated in the right way.



Minimize Use to Maximize Impact

Using your brand color sparingly in an interface primarily populated with more subtle grey or beige tones can help maintain its impact. This approach can be especially useful if you want to add a brightly colored logo to the banner and allow it to stand out as much as possible.

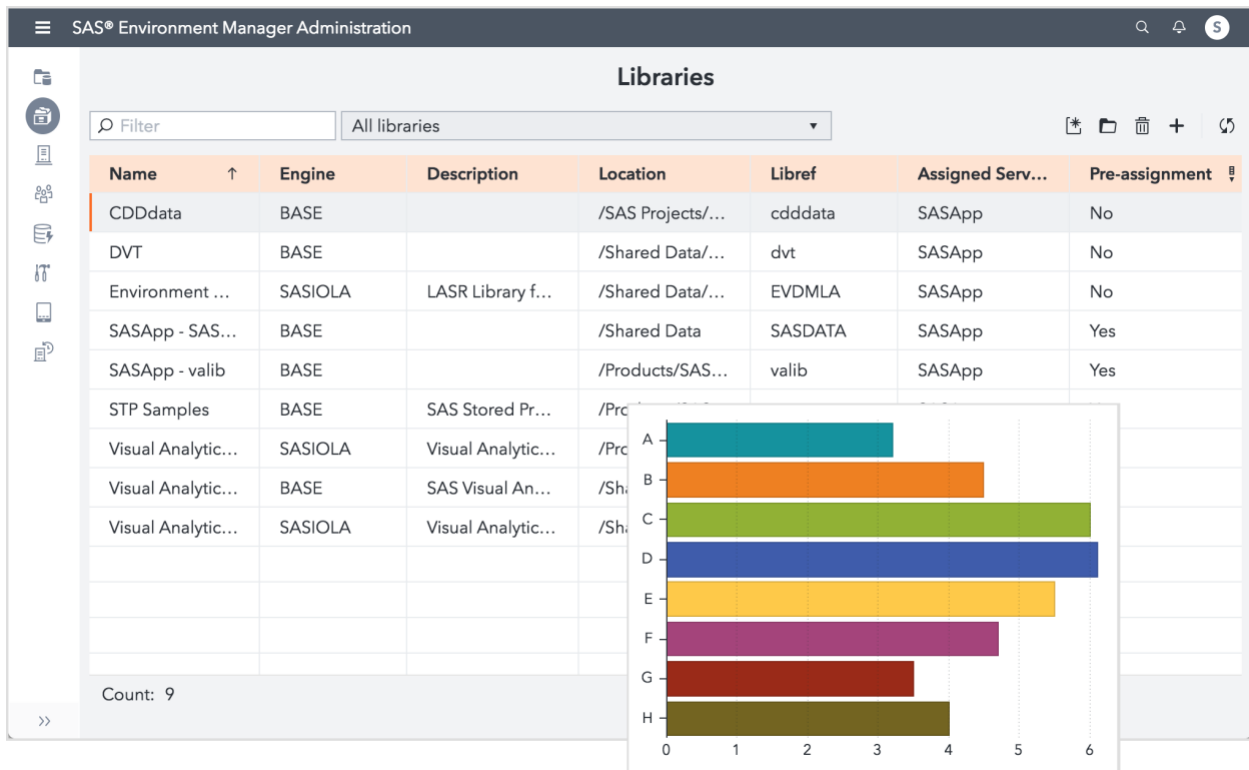


Figure 9. Reserving use of a brand color to a small number of areas can give it more impact when it is used

Base Theme: Illuminate

Customizations:

Interface Styles

- Global > Primary: Set to a medium gray
- Global > Secondary: Set to brand color
- Overrides > Banner > Logo: Add company logo in brand color (optional)
- Overrides > Initial Loading Screen > Spinner color: Set to brand color
- Overrides > Transition Screen > Spinner color: Set to brand color
- Overrides > Tables > Header > Background color: Set to light version of brand color

Shades of a Bright Color

Some bright brand colors will work well directly as a replacement for the Primary color in our base themes. This is especially true for Illuminate. The Primary color is used directly on several elements that need extra attention and is darkened a bit for use in the banner, making it a suitable base for light text and icons.

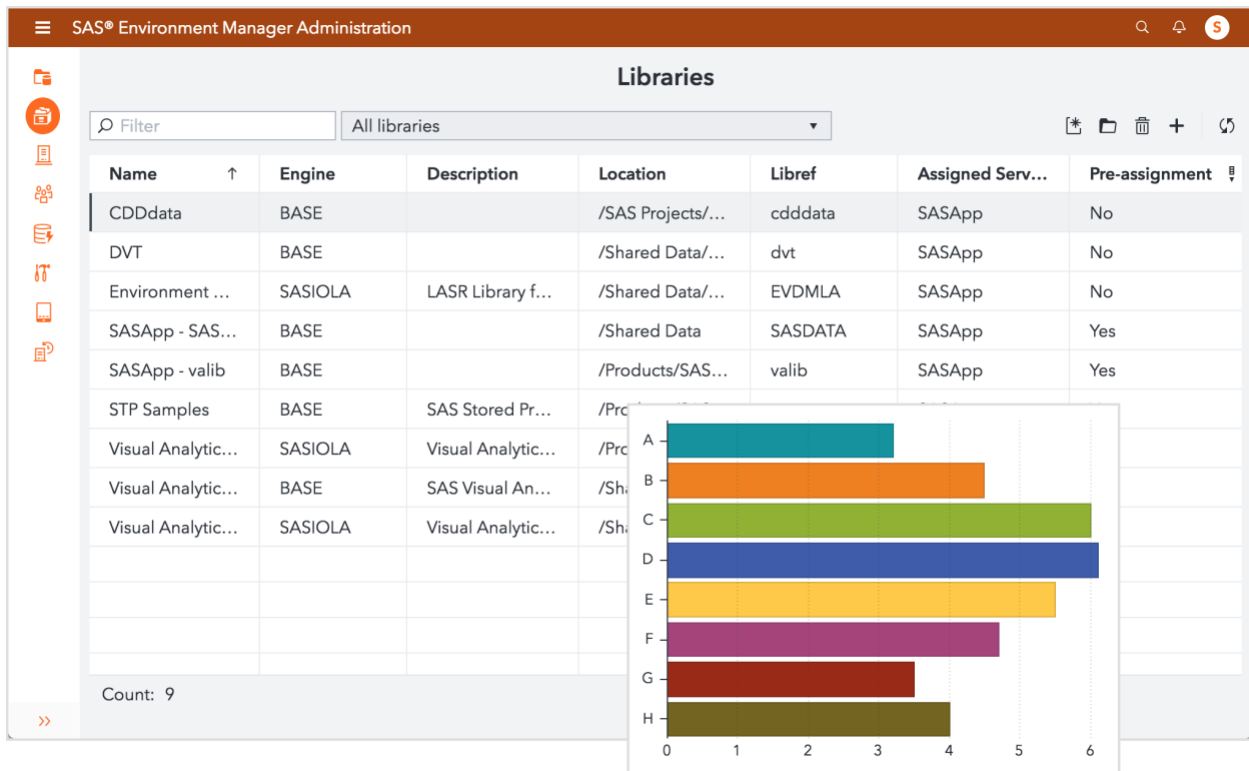


Figure 10. Illuminate creates shades of the Primary color that are suitable for use throughout the interface

Base Theme: Illuminate

Customizations:

Interface Styles

- Global > Primary: Set to brand color
- Global > Secondary: Set to dark grey

Create a Complimentary Backdrop

Another way to set off a striking brand color is to use a more subdued complimentary color in a darker shade as a backdrop. Ignite handles this scenario particularly well by using a variety of darker shades over the entire interface, which allows brighter colors to take the spotlight. Using your bright color in key content elements, like graphs and tables, brings emphasis to the content your users look at most.

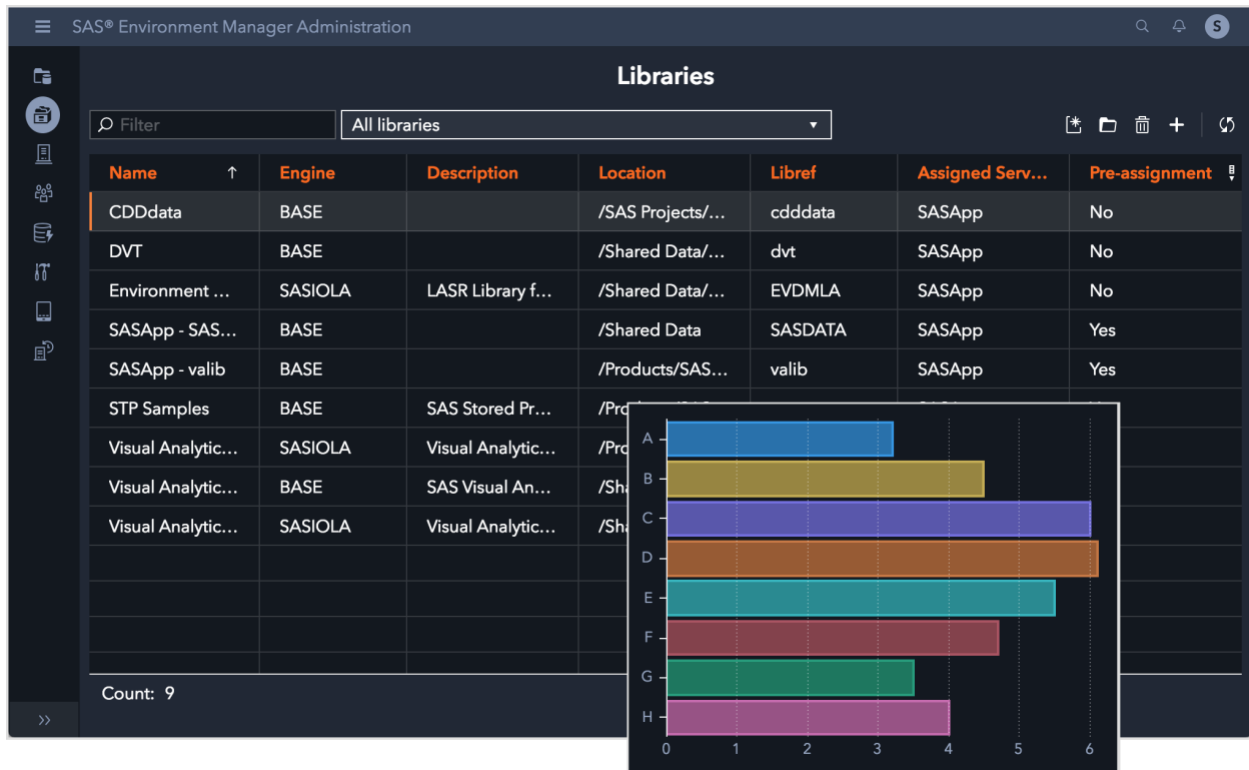


Figure 11. Using the Ignite base theme in a subdued complimentary color can highlight a bright brand color

Base Theme: Ignite

Customizations:

Interface Styles

- Global > Primary: Set to slightly gray navy blue
- Global > Secondary: Set to brand color
- Overrides > Tables > Header > Text color: Set to brand color

Tip: If you want more places to show the brand color, try changing the color of the loading and transition spinner animation, or add a logo featuring your color to the banner.

Graph Styles

- Data Palette: Use the hue slider in the Custom tab of the color picker to adjust the hue of the palette color while maintaining semi-transparent appearance of the bars

CONCLUSION

As you undertake customizing themes for use in your SAS environment, we hope the strategies described herein provide a basis for creating themes that truly represent your brand and offer an excellent experience for your user base. Given the ability to make wide ranging color shifts with very few settings, strategic overrides, and logo placements, we hope you will be on your way to a beautiful theme in no time!

CONTACT INFORMATION <HEADING 1>

Do not change the heading style or the text "CONTACT INFORMATION" of the preceding heading. Do not change the text of the following paragraph. Replace all fields that are shown in angle brackets.

Your comments and questions are valued and encouraged. Contact the authors at:

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