

# Ninecolors: Select Colors with Proper WCAG Color Contrast\*

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## 1 LaTeX2 Colors with Medium Saturation

**Ninecolors** package carefully selects and defines 9 colors for 13 hues each. All colors with the same suffix number have equal luminance level. Also color black is of level 0, and color white is of level 10.

|       |      |        |         |        |        |       |       |        |       |         |          |         |
|-------|------|--------|---------|--------|--------|-------|-------|--------|-------|---------|----------|---------|
| gray1 | red1 | brown1 | yellow1 | olive1 | green1 | teal1 | cyan1 | azure1 | blue1 | violet1 | magenta1 | purple1 |
| gray2 | red2 | brown2 | yellow2 | olive2 | green2 | teal2 | cyan2 | azure2 | blue2 | violet2 | magenta2 | purple2 |
| gray3 | red3 | brown3 | yellow3 | olive3 | green3 | teal3 | cyan3 | azure3 | blue3 | violet3 | magenta3 | purple3 |
| gray4 | red4 | brown4 | yellow4 | olive4 | green4 | teal4 | cyan4 | azure4 | blue4 | violet4 | magenta4 | purple4 |
| gray5 | red5 | brown5 | yellow5 | olive5 | green5 | teal5 | cyan5 | azure5 | blue5 | violet5 | magenta5 | purple5 |
| gray6 | red6 | brown6 | yellow6 | olive6 | green6 | teal6 | cyan6 | azure6 | blue6 | violet6 | magenta6 | purple6 |
| gray7 | red7 | brown7 | yellow7 | olive7 | green7 | teal7 | cyan7 | azure7 | blue7 | violet7 | magenta7 | purple7 |
| gray8 | red8 | brown8 | yellow8 | olive8 | green8 | teal8 | cyan8 | azure8 | blue8 | violet8 | magenta8 | purple8 |
| gray9 | red9 | brown9 | yellow9 | olive9 | green9 | teal9 | cyan9 | azure9 | blue9 | violet9 | magenta9 | purple9 |
| gray1 | red1 | brown1 | yellow1 | olive1 | green1 | teal1 | cyan1 | azure1 | blue1 | violet1 | magenta1 | purple1 |
| gray2 | red2 | brown2 | yellow2 | olive2 | green2 | teal2 | cyan2 | azure2 | blue2 | violet2 | magenta2 | purple2 |
| gray3 | red3 | brown3 | yellow3 | olive3 | green3 | teal3 | cyan3 | azure3 | blue3 | violet3 | magenta3 | purple3 |
| gray4 | red4 | brown4 | yellow4 | olive4 | green4 | teal4 | cyan4 | azure4 | blue4 | violet4 | magenta4 | purple4 |
| gray5 | red5 | brown5 | yellow5 | olive5 | green5 | teal5 | cyan5 | azure5 | blue5 | violet5 | magenta5 | purple5 |
| gray6 | red6 | brown6 | yellow6 | olive6 | green6 | teal6 | cyan6 | azure6 | blue6 | violet6 | magenta6 | purple6 |
| gray7 | red7 | brown7 | yellow7 | olive7 | green7 | teal7 | cyan7 | azure7 | blue7 | violet7 | magenta7 | purple7 |
| gray8 | red8 | brown8 | yellow8 | olive8 | green8 | teal8 | cyan8 | azure8 | blue8 | violet8 | magenta8 | purple8 |
| gray9 | red9 | brown9 | yellow9 | olive9 | green9 | teal9 | cyan9 | azure9 | blue9 | violet9 | magenta9 | purple9 |

By simply choosing two colors in the above list, which differ in level by at least 5, as foreground and background colors, you will get proper [WCAG Color Contrast](#).

The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog.  
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If you need to select more contrasting foreground and background colors, which may have other hues, you could visit [WCAG Color Contrast Tool](#) page which is designed by the first author.

\*<https://github.com/lvjr/ninecolors>

## 2 LaTeX2 Colors with Low Saturation

You can change the saturation of colors by `\NineColors` command. By default `saturation=medium`.

|        |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| high   | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST |
| medium | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST |
| low    | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST |

Colors in the remaining part of the page have been changed by `\NineColors{saturation=low}`.

`Ninecolors` package carefully selects and defines 9 colors for 13 hues each. All colors with the same suffix number have equal luminance level. Also color black is of level 0, and color white is of level 10.

|       |      |        |         |        |        |       |       |        |       |         |          |         |
|-------|------|--------|---------|--------|--------|-------|-------|--------|-------|---------|----------|---------|
| gray1 | red1 | brown1 | yellow1 | olive1 | green1 | teal1 | cyan1 | azure1 | blue1 | violet1 | magenta1 | purple1 |
| gray2 | red2 | brown2 | yellow2 | olive2 | green2 | teal2 | cyan2 | azure2 | blue2 | violet2 | magenta2 | purple2 |
| gray3 | red3 | brown3 | yellow3 | olive3 | green3 | teal3 | cyan3 | azure3 | blue3 | violet3 | magenta3 | purple3 |
| gray4 | red4 | brown4 | yellow4 | olive4 | green4 | teal4 | cyan4 | azure4 | blue4 | violet4 | magenta4 | purple4 |
| gray5 | red5 | brown5 | yellow5 | olive5 | green5 | teal5 | cyan5 | azure5 | blue5 | violet5 | magenta5 | purple5 |
| gray6 | red6 | brown6 | yellow6 | olive6 | green6 | teal6 | cyan6 | azure6 | blue6 | violet6 | magenta6 | purple6 |
| gray7 | red7 | brown7 | yellow7 | olive7 | green7 | teal7 | cyan7 | azure7 | blue7 | violet7 | magenta7 | purple7 |
| gray8 | red8 | brown8 | yellow8 | olive8 | green8 | teal8 | cyan8 | azure8 | blue8 | violet8 | magenta8 | purple8 |
| gray9 | red9 | brown9 | yellow9 | olive9 | green9 | teal9 | cyan9 | azure9 | blue9 | violet9 | magenta9 | purple9 |
| gray1 | red1 | brown1 | yellow1 | olive1 | green1 | teal1 | cyan1 | azure1 | blue1 | violet1 | magenta1 | purple1 |
| gray2 | red2 | brown2 | yellow2 | olive2 | green2 | teal2 | cyan2 | azure2 | blue2 | violet2 | magenta2 | purple2 |
| gray3 | red3 | brown3 | yellow3 | olive3 | green3 | teal3 | cyan3 | azure3 | blue3 | violet3 | magenta3 | purple3 |
| gray4 | red4 | brown4 | yellow4 | olive4 | green4 | teal4 | cyan4 | azure4 | blue4 | violet4 | magenta4 | purple4 |
| gray5 | red5 | brown5 | yellow5 | olive5 | green5 | teal5 | cyan5 | azure5 | blue5 | violet5 | magenta5 | purple5 |
| gray6 | red6 | brown6 | yellow6 | olive6 | green6 | teal6 | cyan6 | azure6 | blue6 | violet6 | magenta6 | purple6 |
| gray7 | red7 | brown7 | yellow7 | olive7 | green7 | teal7 | cyan7 | azure7 | blue7 | violet7 | magenta7 | purple7 |
| gray8 | red8 | brown8 | yellow8 | olive8 | green8 | teal8 | cyan8 | azure8 | blue8 | violet8 | magenta8 | purple8 |
| gray9 | red9 | brown9 | yellow9 | olive9 | green9 | teal9 | cyan9 | azure9 | blue9 | violet9 | magenta9 | purple9 |

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### 3 LaTeX2 Colors with High Saturation

You can change the saturation of colors by `\NineColors` command. By default `saturation=medium`.

|        |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| high   | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST |
| medium | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST |
| low    | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST | TEST |

Colors in the remaining part of the page have been changed by `\NineColors{saturation=high}`.

`Ninecolors` package carefully selects and defines 9 colors for 13 hues each. All colors with the same suffix number have equal luminance level. Also color black is of level 0, and color white is of level 10.

|       |      |        |         |        |        |       |       |        |       |         |          |         |
|-------|------|--------|---------|--------|--------|-------|-------|--------|-------|---------|----------|---------|
| gray1 | red1 | brown1 | yellow1 | olive1 | green1 | teal1 | cyan1 | azure1 | blue1 | violet1 | magenta1 | purple1 |
| gray2 | red2 | brown2 | yellow2 | olive2 | green2 | teal2 | cyan2 | azure2 | blue2 | violet2 | magenta2 | purple2 |
| gray3 | red3 | brown3 | yellow3 | olive3 | green3 | teal3 | cyan3 | azure3 | blue3 | violet3 | magenta3 | purple3 |
| gray4 | red4 | brown4 | yellow4 | olive4 | green4 | teal4 | cyan4 | azure4 | blue4 | violet4 | magenta4 | purple4 |
| gray5 | red5 | brown5 | yellow5 | olive5 | green5 | teal5 | cyan5 | azure5 | blue5 | violet5 | magenta5 | purple5 |
| gray6 | red6 | brown6 | yellow6 | olive6 | green6 | teal6 | cyan6 | azure6 | blue6 | violet6 | magenta6 | purple6 |
| gray7 | red7 | brown7 | yellow7 | olive7 | green7 | teal7 | cyan7 | azure7 | blue7 | violet7 | magenta7 | purple7 |
| gray8 | red8 | brown8 | yellow8 | olive8 | green8 | teal8 | cyan8 | azure8 | blue8 | violet8 | magenta8 | purple8 |
| gray9 | red9 | brown9 | yellow9 | olive9 | green9 | teal9 | cyan9 | azure9 | blue9 | violet9 | magenta9 | purple9 |
| gray1 | red1 | brown1 | yellow1 | olive1 | green1 | teal1 | cyan1 | azure1 | blue1 | violet1 | magenta1 | purple1 |
| gray2 | red2 | brown2 | yellow2 | olive2 | green2 | teal2 | cyan2 | azure2 | blue2 | violet2 | magenta2 | purple2 |
| gray3 | red3 | brown3 | yellow3 | olive3 | green3 | teal3 | cyan3 | azure3 | blue3 | violet3 | magenta3 | purple3 |
| gray4 | red4 | brown4 | yellow4 | olive4 | green4 | teal4 | cyan4 | azure4 | blue4 | violet4 | magenta4 | purple4 |
| gray5 | red5 | brown5 | yellow5 | olive5 | green5 | teal5 | cyan5 | azure5 | blue5 | violet5 | magenta5 | purple5 |
| gray6 | red6 | brown6 | yellow6 | olive6 | green6 | teal6 | cyan6 | azure6 | blue6 | violet6 | magenta6 | purple6 |
| gray7 | red7 | brown7 | yellow7 | olive7 | green7 | teal7 | cyan7 | azure7 | blue7 | violet7 | magenta7 | purple7 |
| gray8 | red8 | brown8 | yellow8 | olive8 | green8 | teal8 | cyan8 | azure8 | blue8 | violet8 | magenta8 | purple8 |
| gray9 | red9 | brown9 | yellow9 | olive9 | green9 | teal9 | cyan9 | azure9 | blue9 | violet9 | magenta9 | purple9 |

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## 4 LaTeX3 Colors for Fun

If you are using a LaTeX3 release not older than 2021-07-12, `Ninecolors` package will define LaTeX3 colors of the same names for you.

For example, you can change the color of drawing operations by `\color_fill:n {color expression}` command for fills, `\color_stroke:n {color expression}` command for strokes.

