# HSB/HSV color system

Explaining hue, saturation, brightness

HSB is stands for *hue, saturation, brightness*. It is a color system, to pick color. It's being said that this system is more human-friendly to describing color. In Wikipedia, the term is called HSV (hue, saturation, value). Before I writing this story, the only way I understand to pick color is using RGB color system. I know this from learning CSS in web development. Lets jump into the detail about Hue, saturation, and Brightness.

Hue

Hue is the color that we choose. It ranges from 0 to 360. We can visualize it like circle, since it has 360°.
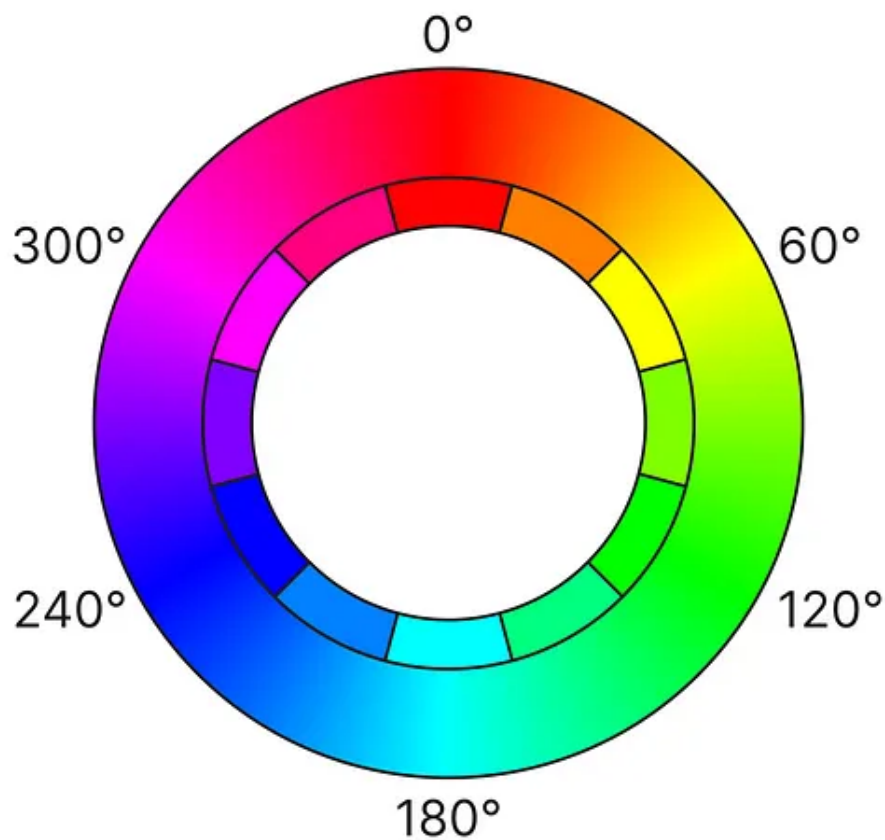
HSB color wheel.

If we look closely on the picture above, it actually a mix of color red, green and blue. We can consider it as base color. since it is 360 degrees, that means we have three region for three base color.

- Red = 0° (or 360°)

- Green =120°

- Blue = 240°

Since red is 0°. and a degree is representing only one color, that means 1° is NOT that "base red" anymore, although it still looks red in human eyes, at least in my own eyes. But in HEX format, the "base red" is **#FF0000**, and the "one-degree-red" is **#FF0400.** That will be different in computer's "eyes", because inside of computer, everything is processed into 1 and 0, which means that color is just bits.

So when I'm trying to choose what color to use, I can just type a number and remembering those base color, to imagine in what color region I am right now(although we must be have color picker in our app that can help us).

*It's just a thought/opinion (a critics is appreciated), an intermezzo maybe. Can skip it to "Saturation" right away. I'd like to visualize it this way. let say the base color (R,G,B) is the "president". And the president lead it's nation of 120 degrees wide. The presidents is in the center of their nation, which means their "people" is spread across the land — right and left — evenly. Thus, the "president R" lead "person 300°" to "person 60°". That means color 60° is — in the region of — R (it's yellow actually), but color 61° is not R anymore. But since 60° — and also 180° and 300° — is an even mix of the base colors, I'd say those colors have "double citizenship". For example, the color 60° is yellow, it is an even mixture of base R and G or let say it is in the very edge between R and G. in HEX, the value is **#FFFF00**. In HEX format, the format is (**#RRGGBB), FF** is like the max value and **00** is the minimum. SO, according to this colors cheat sheet, 180° and 300° is respectively cyan (**#00FFFF**) and magenta (**#FF00FF**).*

Saturation

Saturation is the richness in the hue (color). Think of it as how much you put the color into your object. It is a number between 0 and 100. While hue is presented with degrees (°), in saturation we can use percentage (%). Thus, 0% is the very least of color you put while 100% is the maximum, makes the color "saturate", hence it accordance with the term.

This illustrate the effect of saturation with hue and brightness value of example one and two respectively (H:240, B:100) and (H:320, B:100).

0%	25%	50%	75%	100%

0%	25%	50%	75%	100%
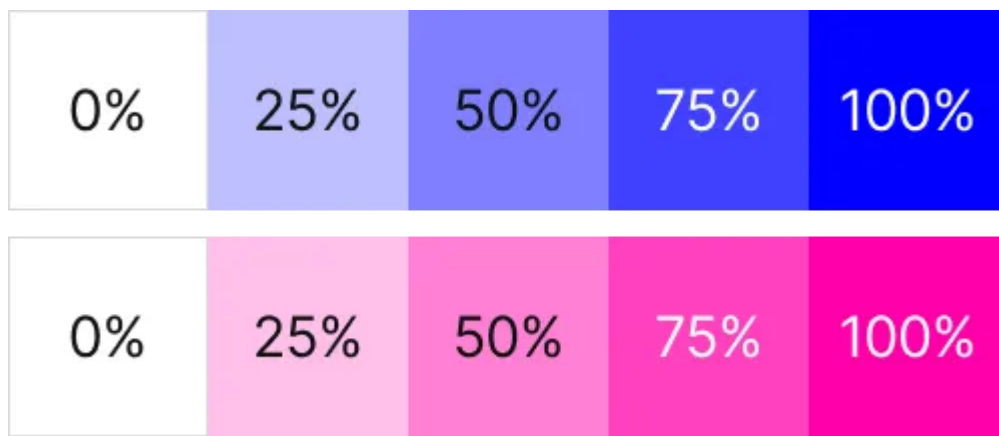
Range of saturation

Brightness

Brightness is how much you put the light into the object. It is also a number between 0 and 100 and written in percentage, like saturation.

- 0% brightness is **black**, regardless of how much the hue and saturation.

- 100% brightness is the color according to hue and saturation, it will be **white** if saturation is 0%.

This illustrate the effect of brightness with hue and saturation value (H:0, S:100)
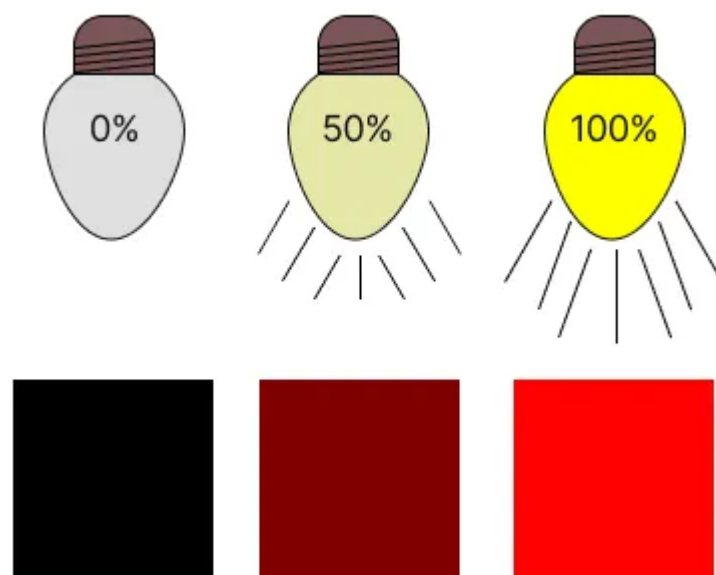
Visualization of brightness effect.

When the lightbulb is off (0% of brightness), The color turns into black, But when the lightbulb is fully on (100%), the color is visible, depends on the hue and saturation.