



P5js: loops, HSB and Arrays

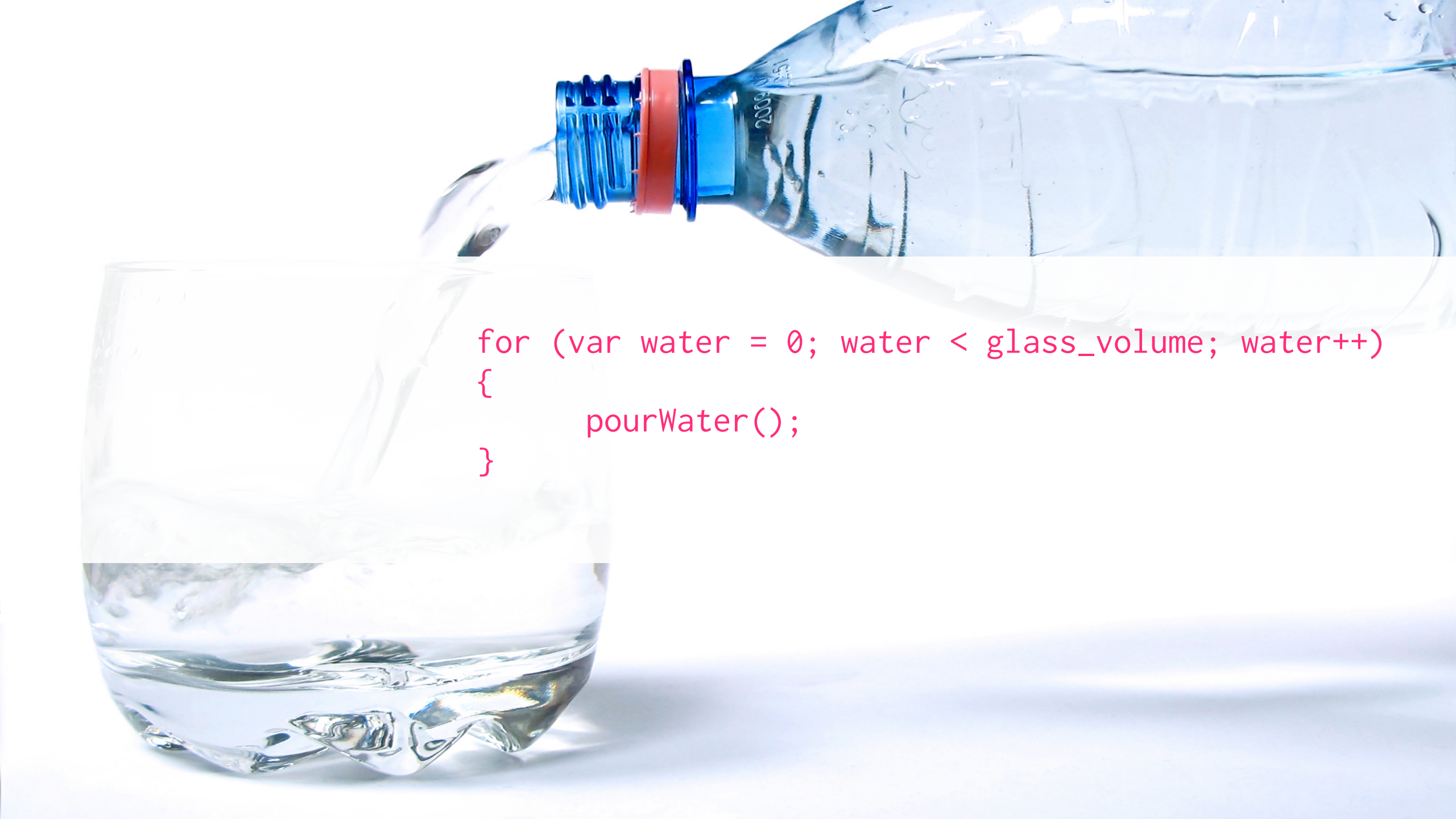


How would we fill a screen with boxes?





for loops(){}

A clear plastic bottle is tilted, pouring water into a glass. The water is captured mid-pour, creating a dynamic splash in the glass. The bottle has a blue cap with a red seal. The background is a plain, light-colored surface.

```
for (var water = 0; water < glass_volume; water++)  
{  
    pourWater();  
}
```




```
for (var positionOfPlayHead = 1000; positionOfPlayHead >  
0; positionOfPlayHead--)  
{  
    rotate();  
}
```

For loops

- **Initializer:** There's an initial state, the initializer at the start of the loop.
- **Conditional:** A statement of which the outcome will change during the loop's duration. (eventually, the glass will be full);
 - When the conditional eventually changes state from true to false or false to true, the loop ends. (stop pouring water)
- **Iteration step:** There's a way to increment through each iteration of the loop by incrementing (or decrementing) a value. (adding more water)

Exercise!

Think through the logic of making one row of boxes spanning the whole screen's width all exactly 20 pixels wide and tall.

*Don't worry about code yet use words to describe the process of doing it by hand using code like logic (pseudo code).

The background of the slide features a close-up, slightly angled view of an Atari 2600 console and its keyboard. The console is a light beige color, and the keyboard is black with white lettering. The text "Racing the beam" is overlaid in a large, pink, sans-serif font. Below the title, there is a semi-transparent white box containing text about the Atari 2600's video output process. The text is in a black, sans-serif font and includes several blue underlined terms: "video frame buffer", "machine cycles", and "electron beam".

Racing the beam

the Atari 2600, initially branded the VCS (Video Computer System), did not have a [video frame buffer](#), and required the programmers to write each line of video to the television, one line at a time. As there were only a limited number of [machine cycles](#) in which to do this, the programmers were literally racing a high speed [electron beam](#) across the screen



But what about the rest of the rows?



Nested for loops

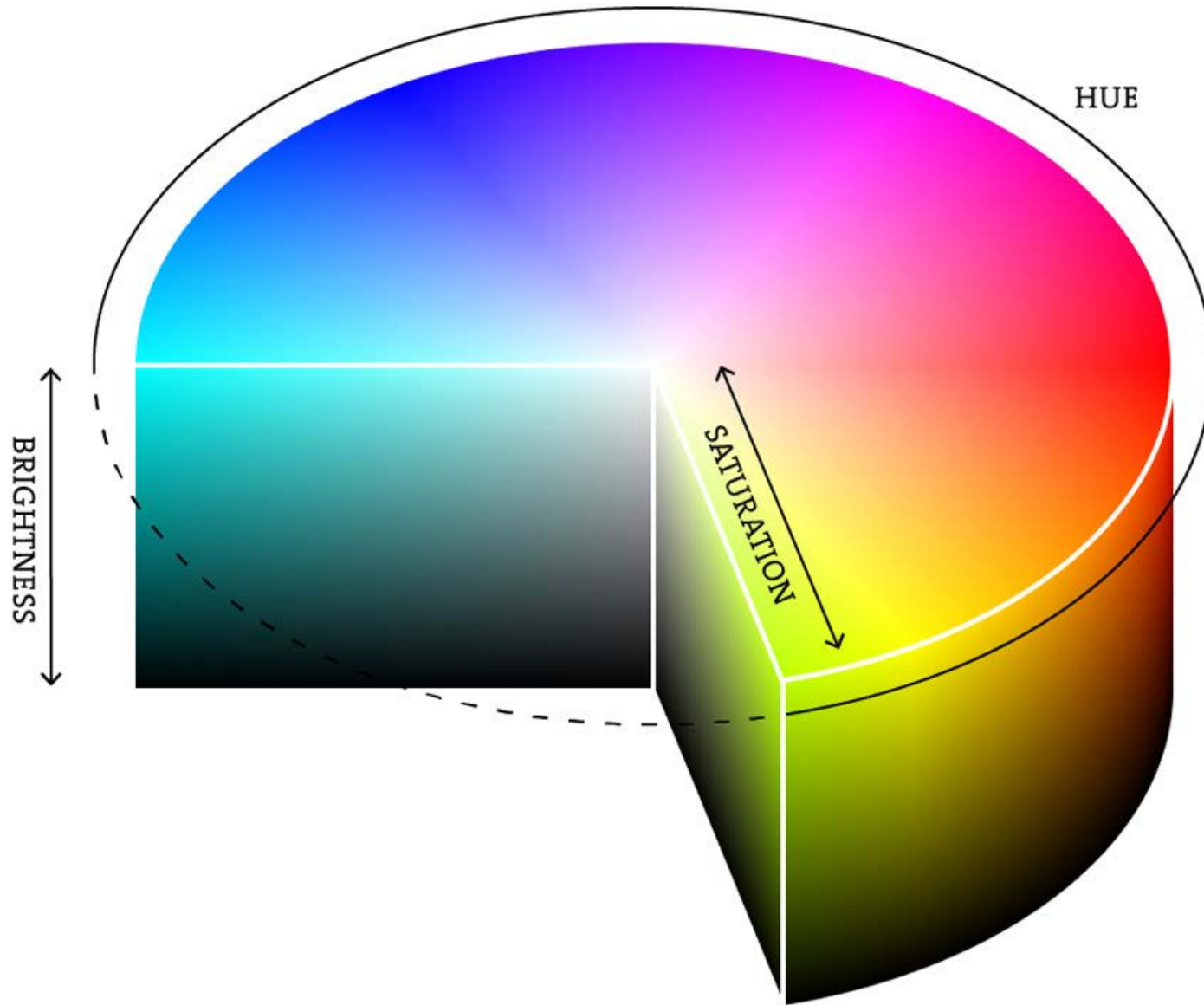
For loops can be nested. You just must include an **initializer**, **iteration** and **condition** for each loop. What would this look like for a whole screen?



Exercise!

Think through the logic of making many rows of boxes, each which spans the whole width of the screen until you're at the height of the canvas.

*Don't worry about code yet use words to describe the process of doing it by hand using code like logic (pseudo code).

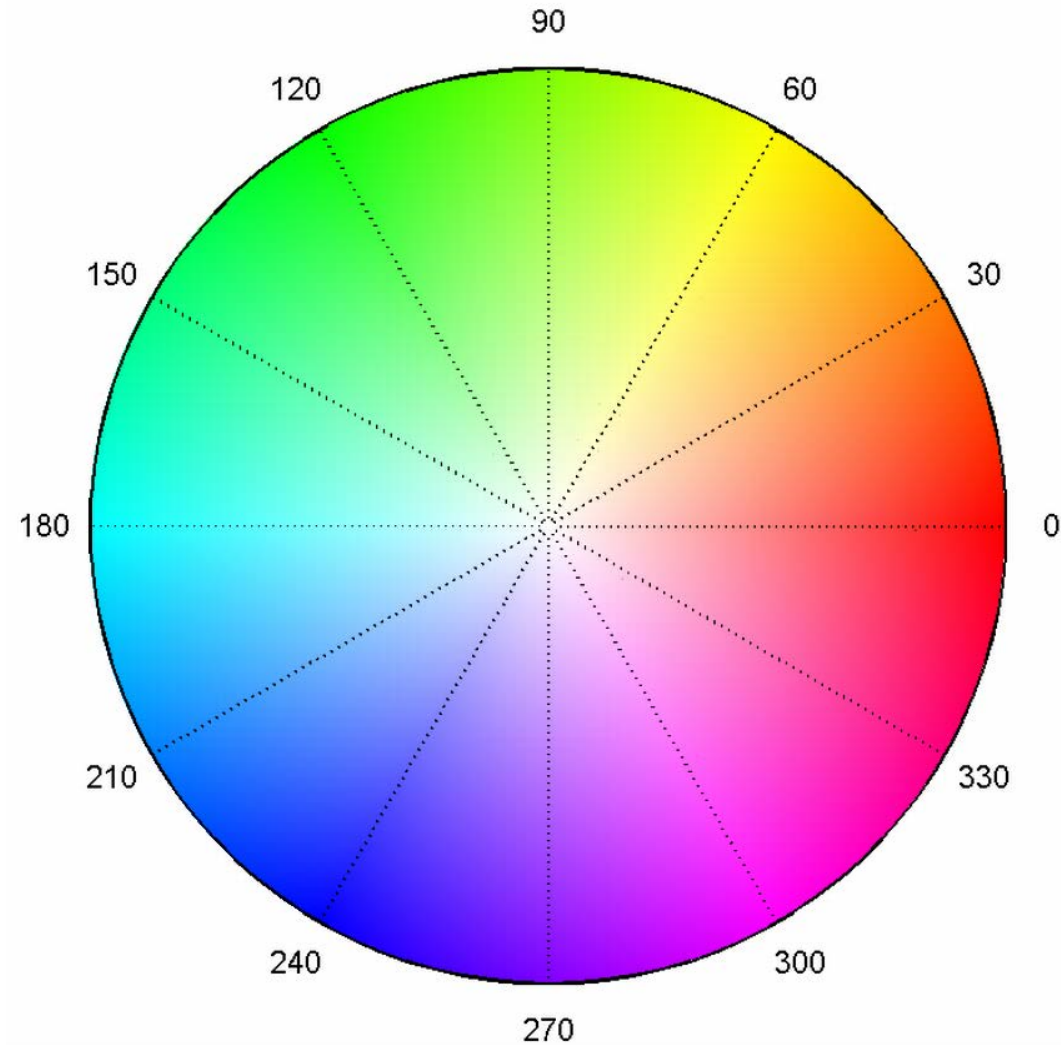


HSB: Hue,
Saturation,
Brightness

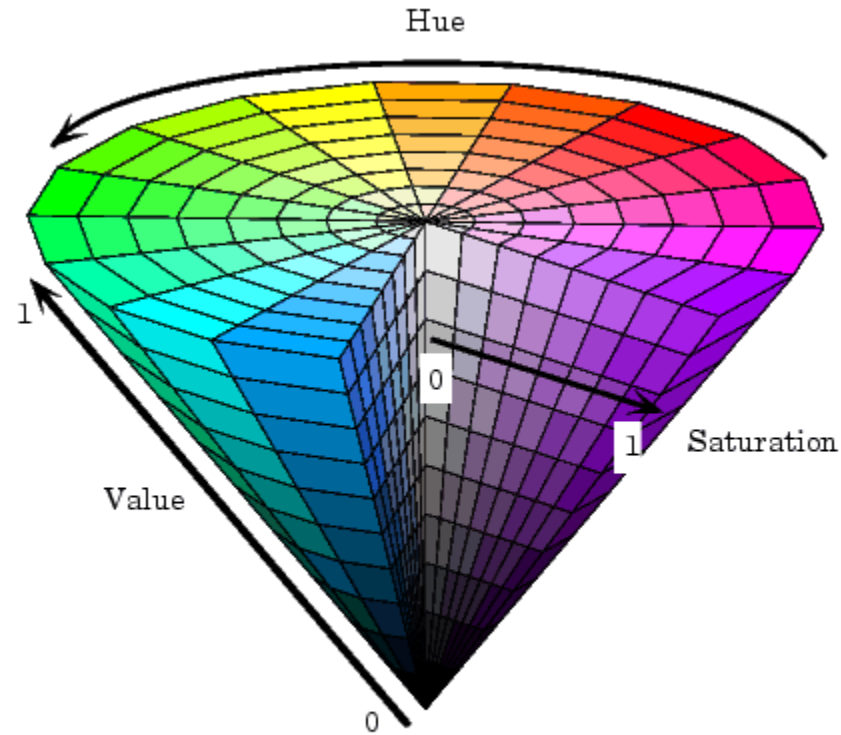
HSB or HSV

- **Hue:** The color.
- **Saturation:** the amount of white in the color;
- **Brightness (or value):** the amount of black in the color;

Hue as a circle from 0 to 360 degrees



Saturation and Brightness (or Value) from 0 – 100 or 0 to 1



How to use HSB/HSV in p5

Syntax

```
colorMode(mode, [max])
```

```
colorMode(mode, max1, max2, max3, [maxA])
```

```
colorMode(HSB, 360, 100, 100);  
colorMode(RGB, 1, 1, 1); //this is tricky! 1 is now just equal to full  
color, up until now that's been 255
```

Exercise!

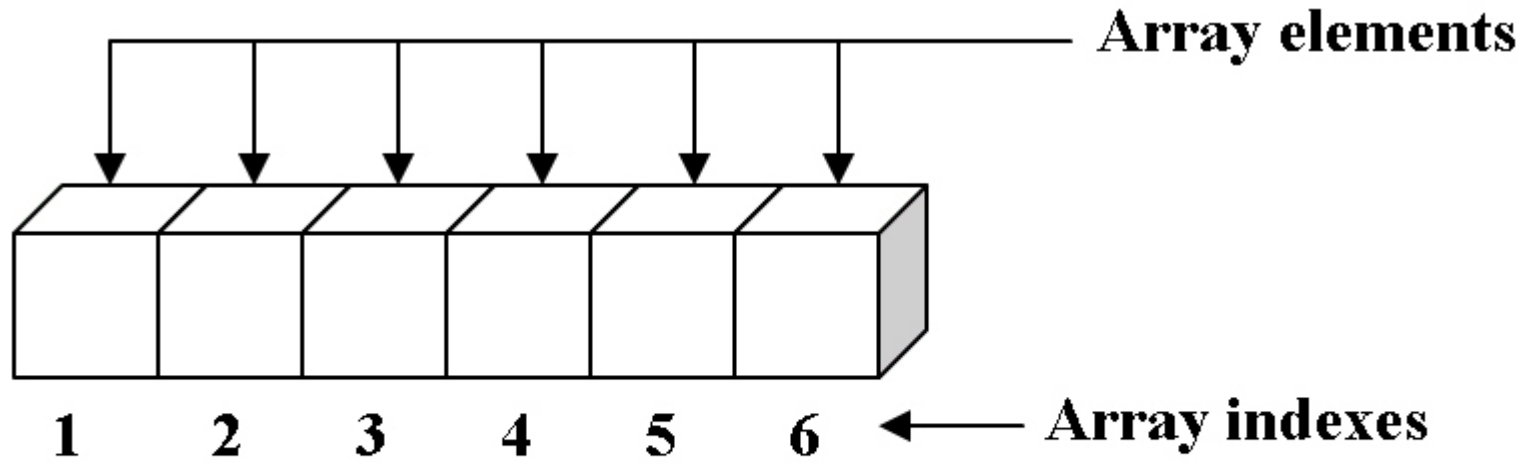
Tie the color of the box to the position of the mouse in HSB



Let's make a spectrum



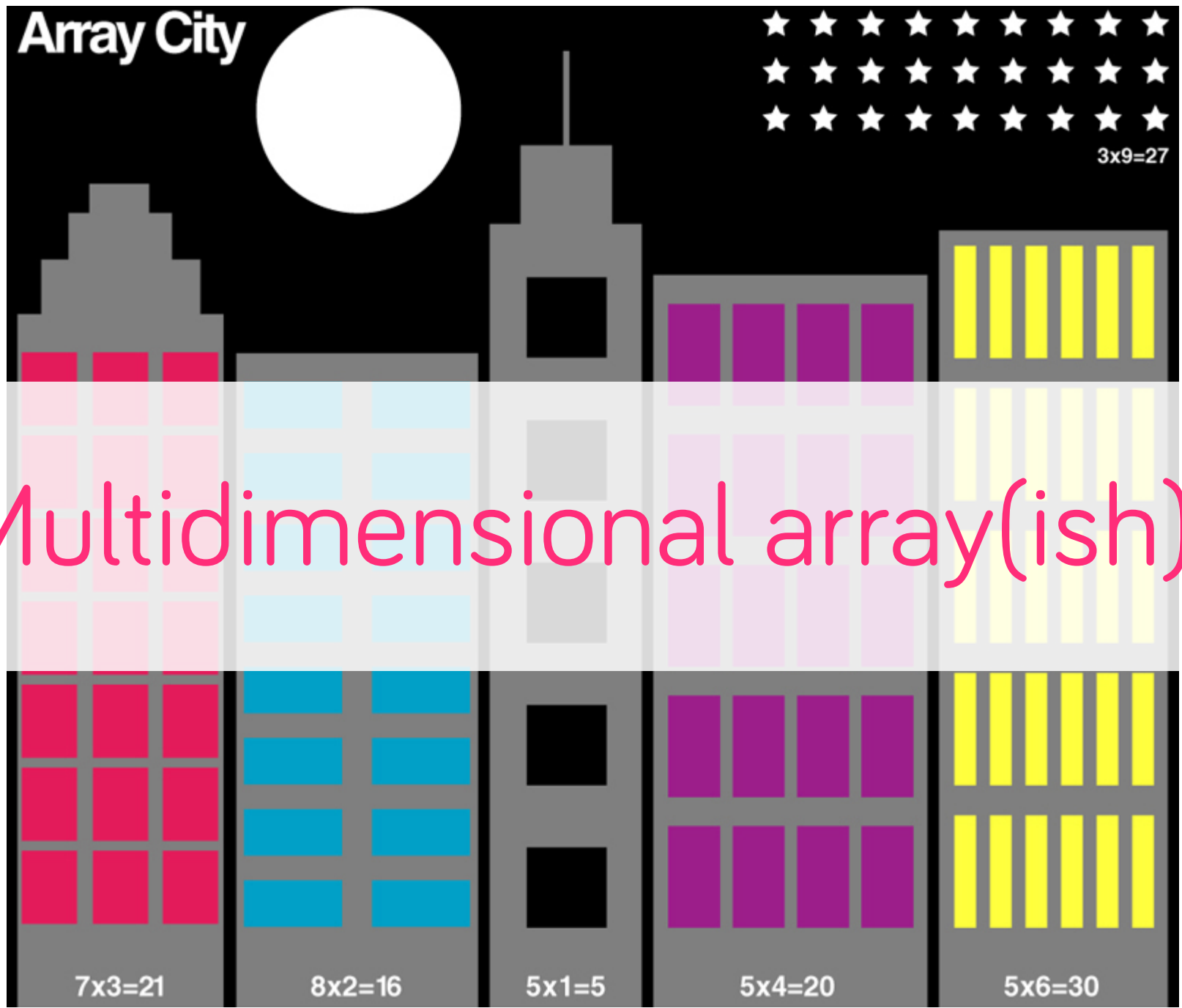
Arrays



One-dimensional array with six elements

Arrays

- **Arrays:** collections of groups of objects
- **Array Size:** the length of the array
- **Array Element:** An object in an array
- **Array Index:** Position of an object in an array



Multidimensional array(ish)

Homework:

Draw a tic tac toe board on screen and think about how we can use arrays to create the game