Exploring data #1

Aesthetics

Plot aesthetics

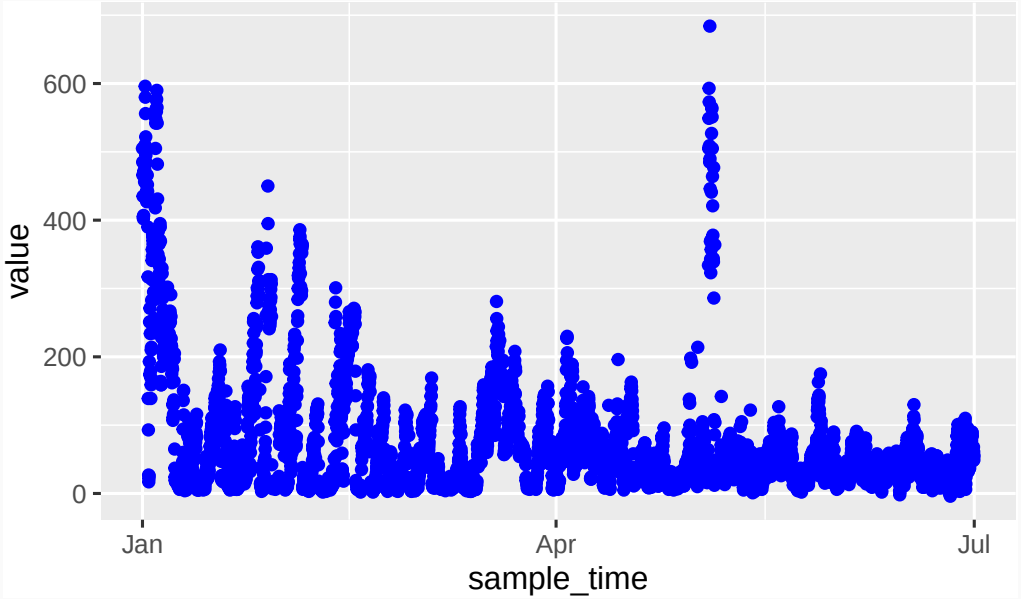
Which aesthetics you must specify in the `aes` call depend on which geom you are adding to the plot.

You can find out the aesthetics you can use for a geom in the "Aesthetics" section of the geom's help file (e.g., `?geom_point`).

Required aesthetics are in bold in this section of the help file and optional ones are not.

Constant aesthetics

Instead of mapping an aesthetic to an element of your data, you can use a constant value for the aesthetic. For example, you may want to make all the points blue, rather than having color map to AQI:

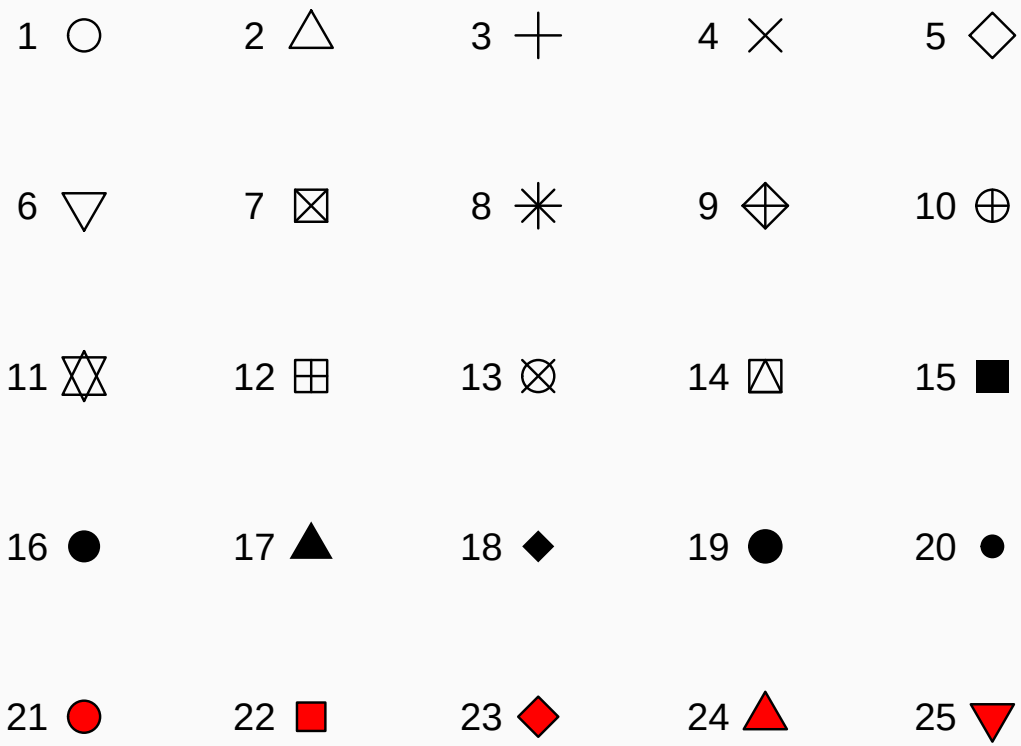


In this case, you can define that aesthetic as a constant for the geom, **outside** of an `aes` statement.

Constant aesthetics

For example, you may want to change the shape of the points in a scatterplot from their default shape, but not map them to a particular element of the data.

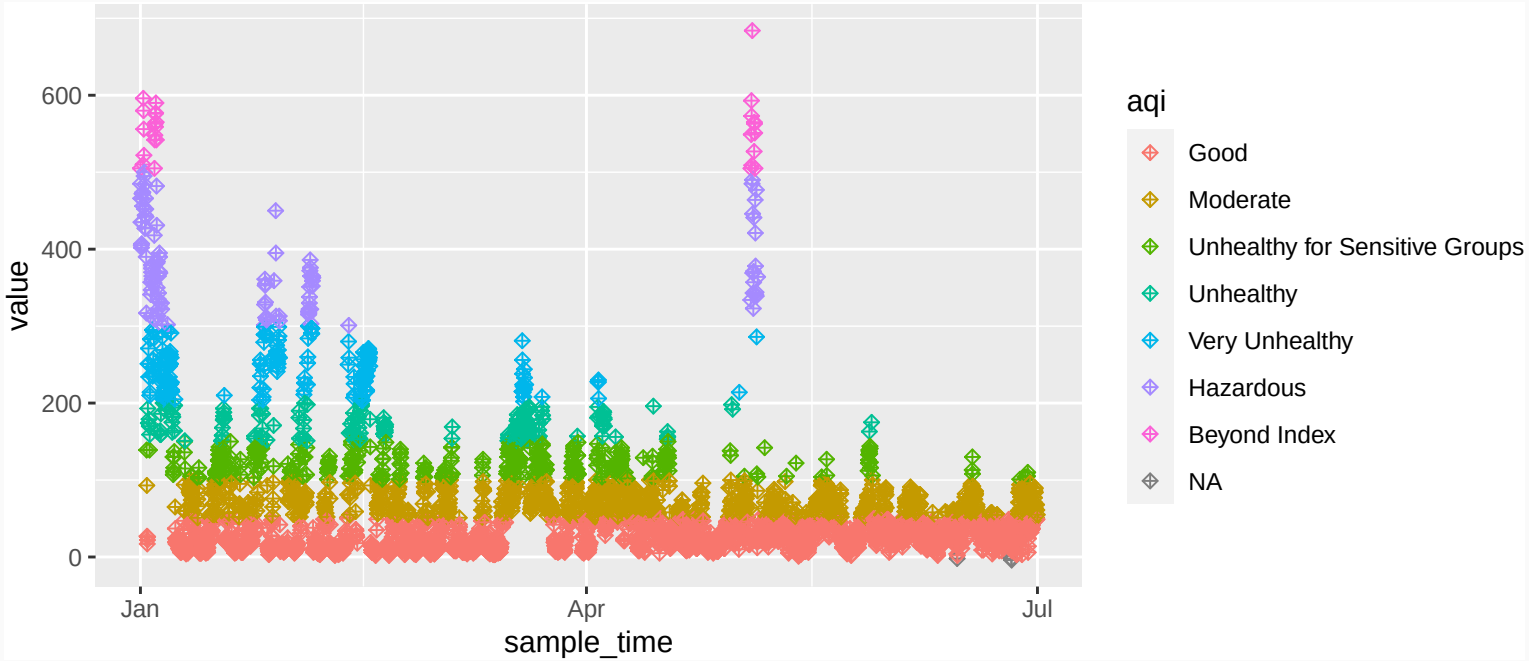
In R, you can specify point shape with a number. Here are the shapes that correspond to the numbers 1 to 25:



Constant aesthetics

Here is an example of mapping point shape to a constant value other than the default:

```
ggplot(data = beijing_pm) +
  geom_point(mapping = aes(x = sample_time, y = value,
                           color = aqi),
             shape = 9)
```



Constant aesthetics

R has character names for different colors. For example:

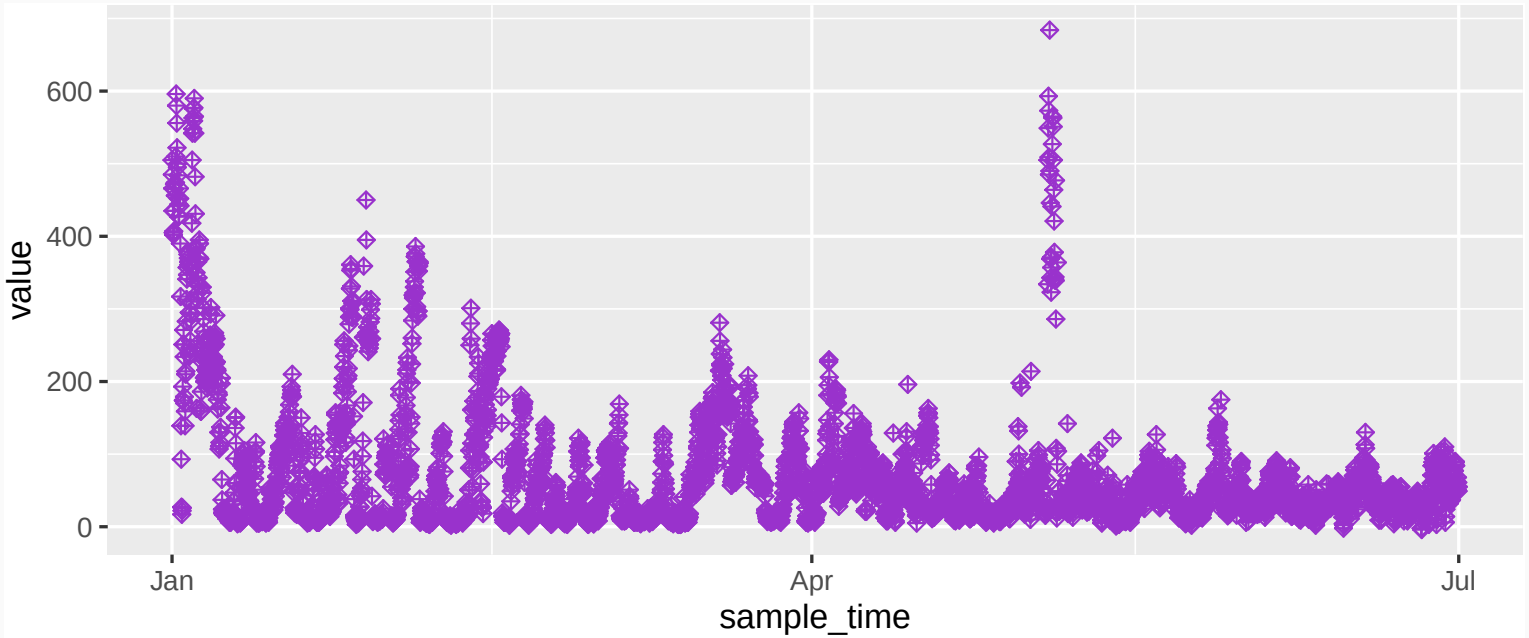
```
## Warning: `data_frame()` is deprecated as of tibble 1.1.0.
## Please use `tibble()` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_warnings()` to see where this warning w
```

- blue
- blue4
- darkorchid
- deepskyblue2
- steelblue1
- dodgerblue3

Constant aesthetics

Here is an example of mapping point shape and color to constant values other than the defaults:

```
ggplot(data = beijing_pm) +
  geom_point(mapping = aes(x = sample_time, y = value),
             shape = 9,
             color = "darkorchid")
```



Useful plot additions

There are also a number of elements that you can add onto a `ggplot` object using +. A few very frequently used ones are:

Element	Description
`ggtitle`	Plot title
`xlab`, `ylab`, `labs`	x- and y-axis labels
`xlim`, `ylim`	Limits of x- and y-axis
`expand_limits`	Include a value in a range

Useful plot additions

```
ggplot(data = beijing_pm) +
  geom_point(mapping = aes(x = sample_time, y = value)) +
  labs(x = "Sampling Date and Time",
       y = "PM2.5 Concentration") +
  ggtitle("Measurements of PM2.5 in Beijing, China, 2017",
          subtitle = "Based on U.S. Embassy Monitor")
```