ggplot – themes and wrapup

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PLS 397 Analyzing and Visualizing Data
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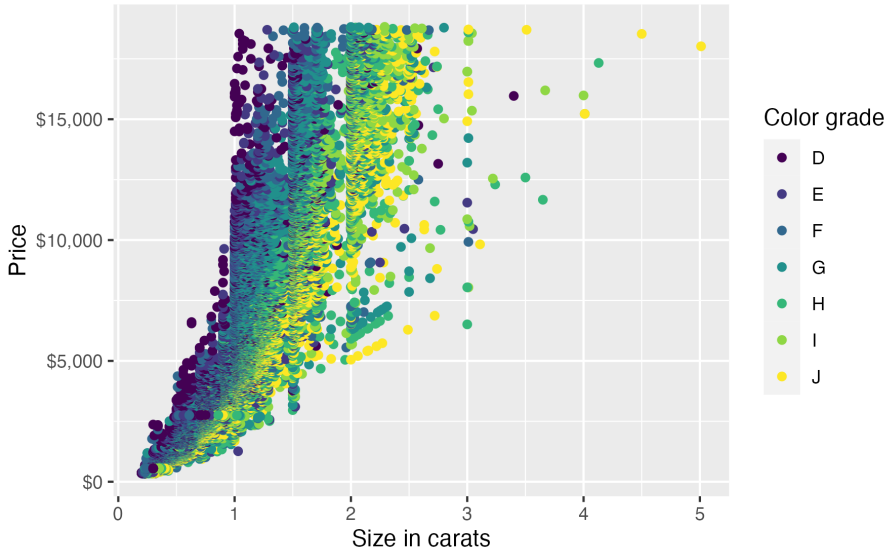
https://forms.gle/7Y9ySnFB3JQWSB4s5

Wednesday's reading: 5.1 Use pipes to summarize data

ggplot wrapup

- ▶ We've covered most of the basics of ggplot at this point.
- ▶ There's always more to learn! The cheatsheet + Google + ChatGPT will help you figure out specific things you want to add.
- ▶ More advanced figures require manipulating data–we'll turn to that next.
- ▶ One last fun thing in basic ggplot: changing the theme
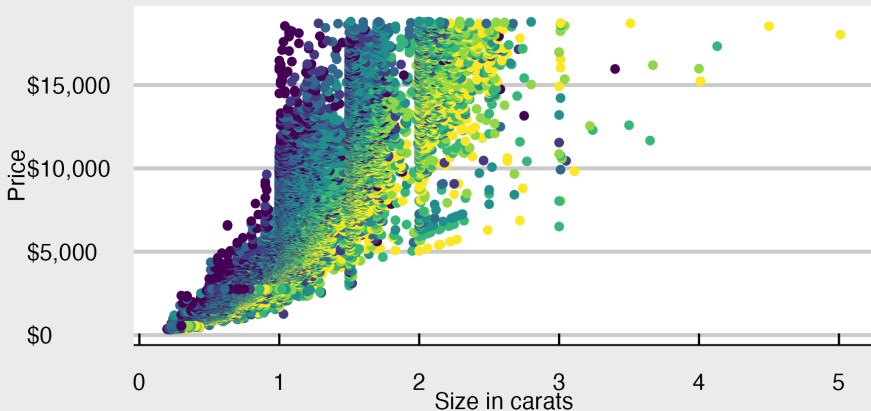
Example – Basic ggplot theme

Example — + `theme_economist_white()`

Diamond prices
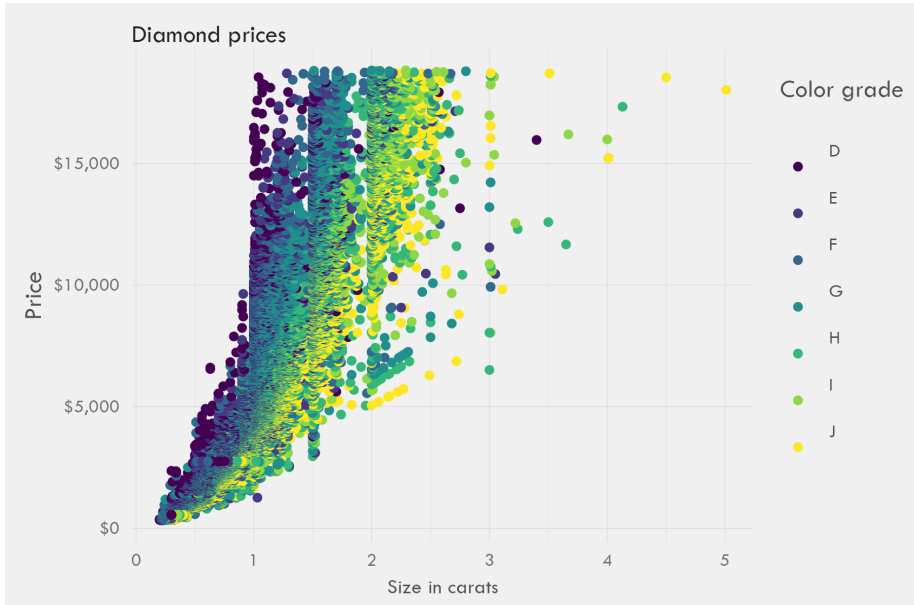
Color grade: D E F G H I J

Price: $0, $5,000, $10,000, $15,000

Size in carats: 0, 1, 2, 3, 4, 5

Example – Custom theme

Themes

► Lots of prebuilt themes for ggplot–some built-in, others in the ggthemes package and elsewhere.

► https://exts.ggplot2.tidyverse.org/ggthemes.html

► `install.packages('ggthemes', dependencies = TRUE)`

► `+ theme_fivethirtyeight()`, `+ theme_economist()`, etc.

Making your own theme

```
theme(
  line,
  rect,
  text,
  title,
  aspect.ratio,
  axis.title,
  axis.title.x,
  axis.title.x.top,
  axis.title.x.bottom,
  axis.title.y,
  axis.title.y.left,
  axis.title.y.right,
  axis.text,
  axis.text.x,
  axis.text.x.top,
  axis.text.x.bottom,
  axis.text.y,
  axis.text.y.left,
  axis.text.y.right,
  axis.ticks,
  axis.ticks.x,
  axis.ticks.x.top,
  axis.ticks.x.bottom,
  axis.ticks.y,
  axis.ticks.y.left,
  axis.ticks.y.right,
  axis.ticks.length,
```

► ggplot lets you customize most of the visual aspects of your plot.
► The pre-built themes above work this way.
► You can modify a theme by adding a new layer: + theme(axis.ticks = ...)
►
  https://ggplot2.tidyverse.org/reference/theme.html

Theme options

```
element_blank()

element_rect(
  fill = NULL,
  colour = NULL,
  linewidth = NULL,
  linetype = NULL,
  color = NULL,
  inherit.blank = FALSE,
  size = deprecated()
)

element_line(
  colour = NULL,
  linewidth = NULL,
  linetype = NULL,
  lineend = NULL,
  color = NULL,
  arrow = NULL,
  inherit.blank = FALSE,
  size = deprecated()
)
```

```
element_text(
  family = NULL,
  face = NULL,
  colour = NULL,
  size = NULL,
  hjust = NULL,
  vjust = NULL,
  angle = NULL,
  lineheight = NULL,
  color = NULL,
  margin = NULL,
  debug = NULL,
  inherit.blank = FALSE
)
```

Example:
+theme(panel.grid.major=
element_line(
color=color.grid.major,
size=.15))

In-class exercise

https://www.economist.com/graphic-detail/2019/03/21/economic-growth-does-not-guarantee-rising-happiness

- ► Economists strongly believe that increased income should increase happiness
- ► A cross-national correlation shows this is true.
- ► But do changes in income produce changes in happiness?
- ► Data: Gallup polling + World Bank GDP per capita data

Figure from *The Economist*

GDP per person v self-reported happiness
85 countries with adult population over 5m
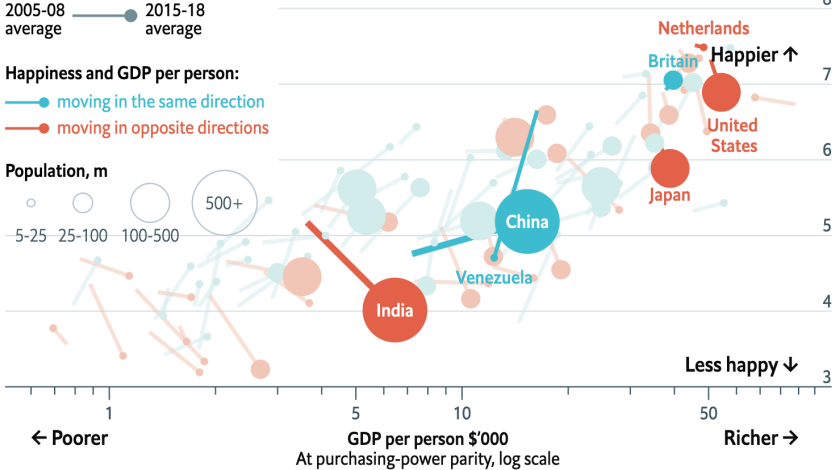
Happiness
0-10 scale

2005-08 average — 2015-18 average

Happiness and GDP per person:
— moving in the same direction
— moving in opposite directions

Population, m
5-25 25-100 100-500 500+

Netherlands
Britain
Happier ↑
United States
Japan
China
Venezuela
India
Less happy ↓

GDP per person $'000
At purchasing-power parity, log scale

← Poorer   Richer →

In-class exercise hints

We're going to recreate this figure!
Hints:

▶ Start with the points. Think about the arguments to `aes` to get the size and color right.

▶ Then add the lines. Note that these are in a second dataframe. We can use `geom_path` with the texttttgroup aesthetic

▶ If you finish that, work on making the labels and themes look good.

▶ And if you're way ahead, think about how this figure could be improved!