

05

Information Visualization

Daniel Gonçalves, Sandra Gama

Tabular data II + Visualising Time



Get Ready...

http://etc.ch/KizW





HELP ME HELP YOU

01

DISTRIBUTIONS



KEEP
CALM

TELL ME
WHAT TO DO

Tell me what to do!



KEEP
CALM
TELL ME
WHAT TO DO

Represent the data in this table!

(age of Titanic Passengers)

age

30

25

2

47

47

62

39

53

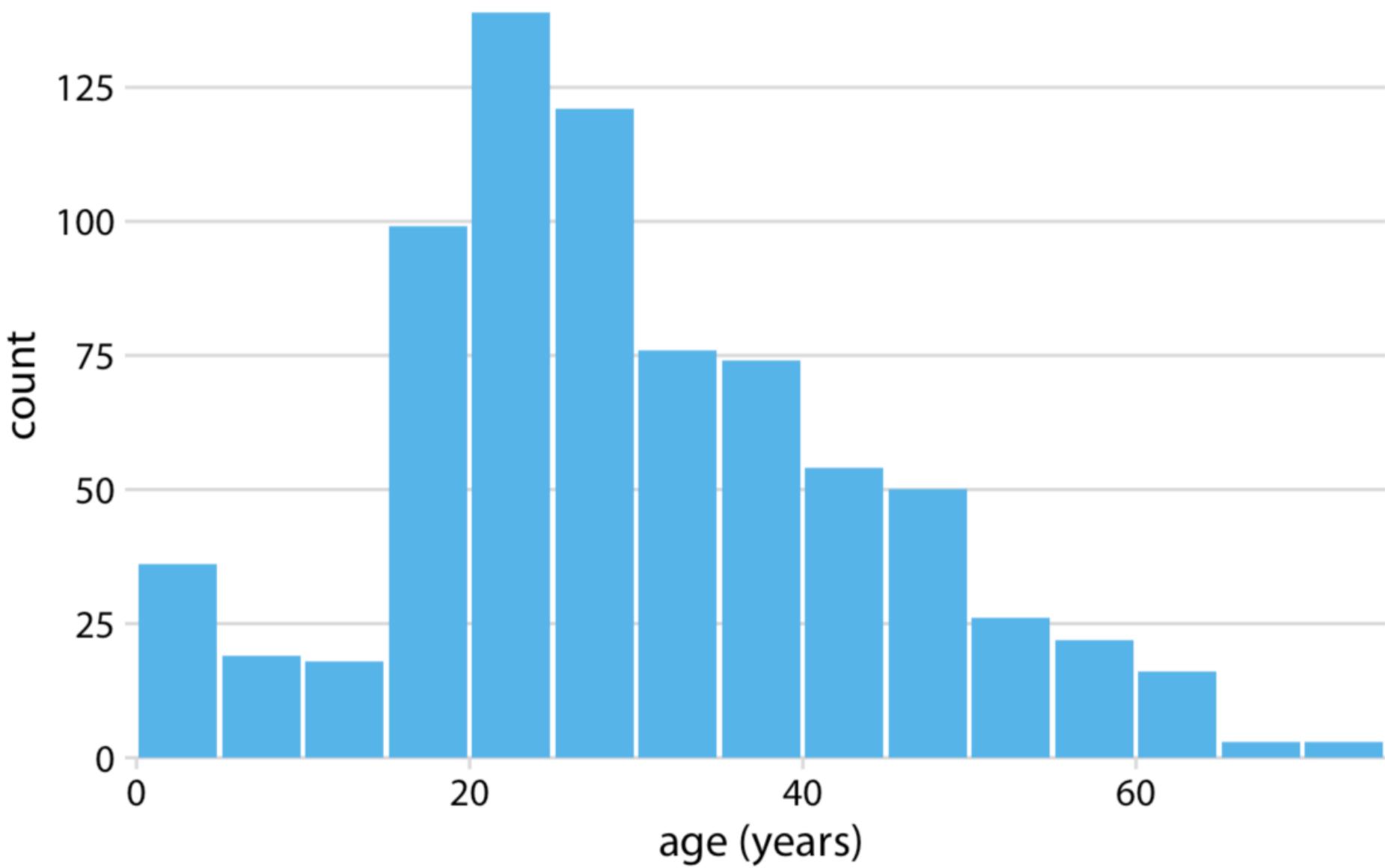
71

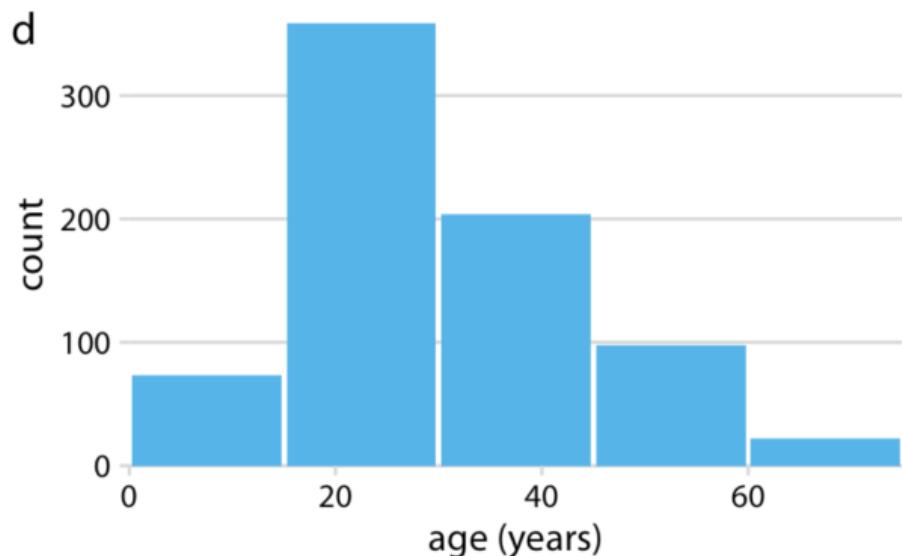
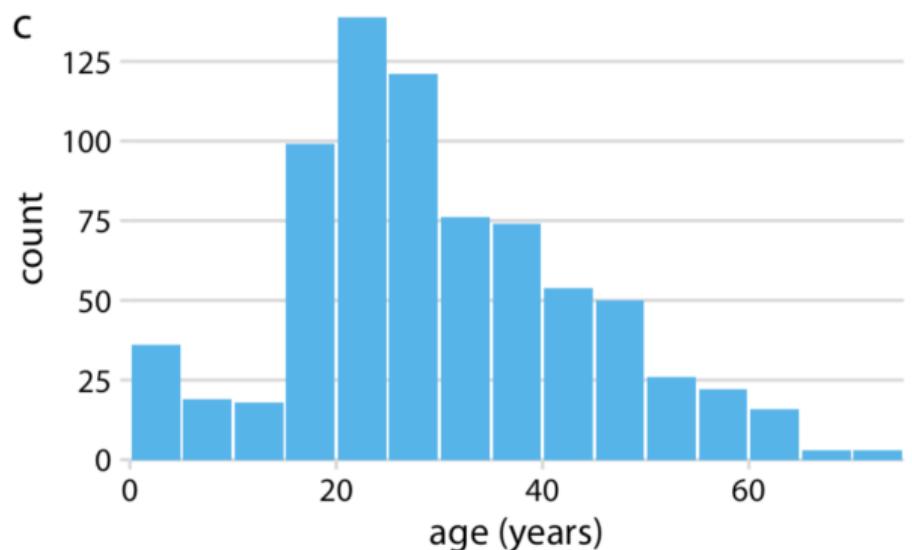
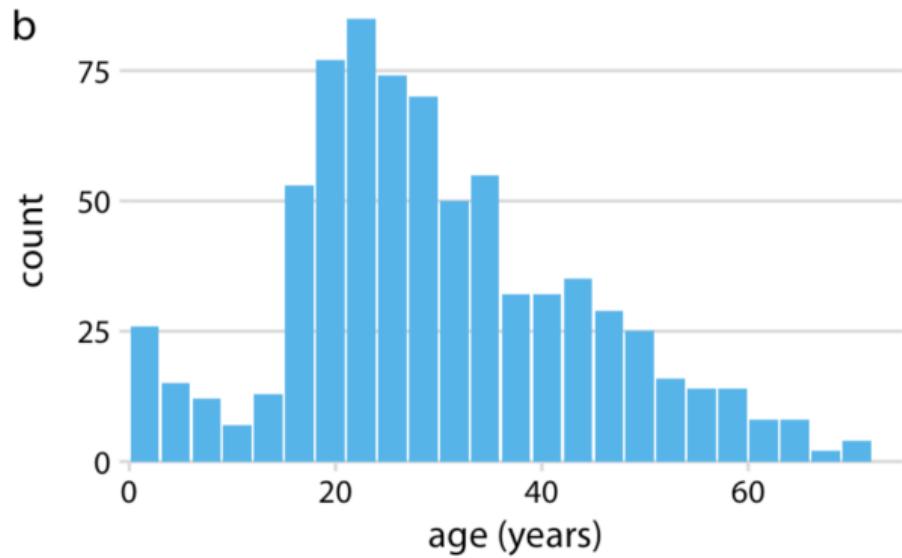
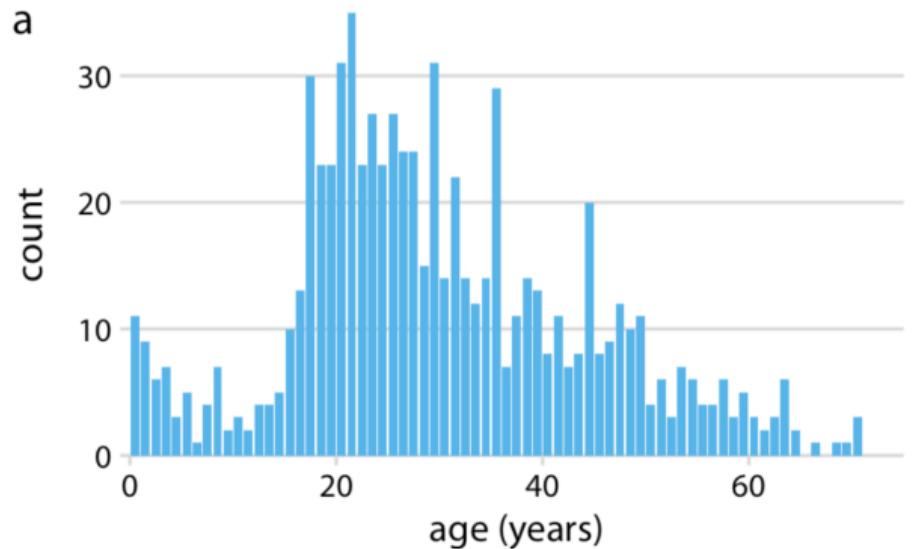
47

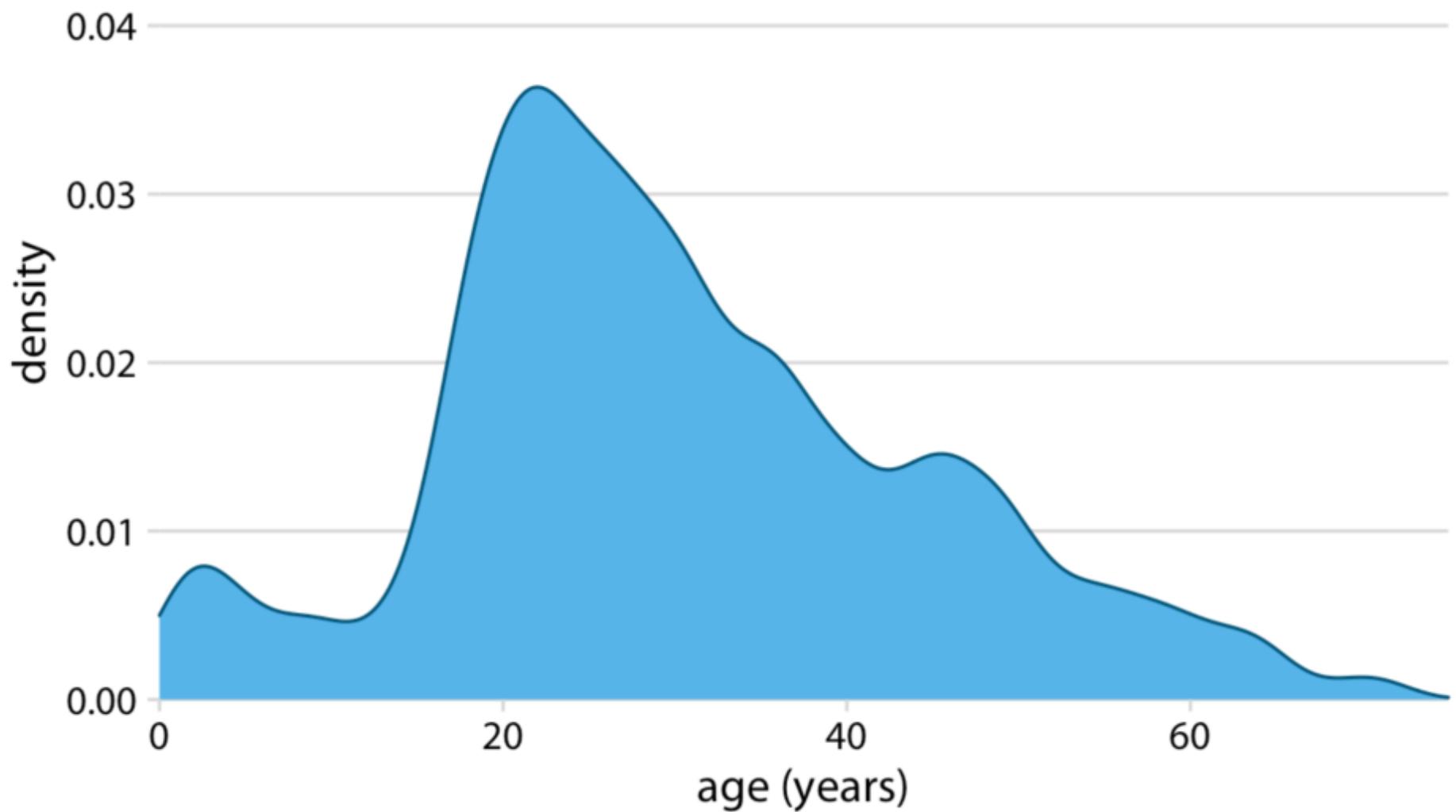
18

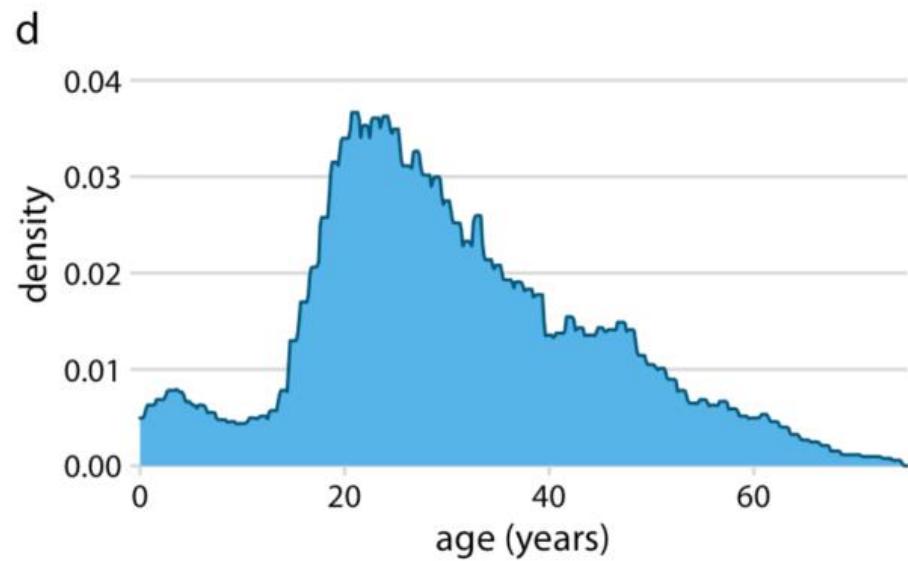
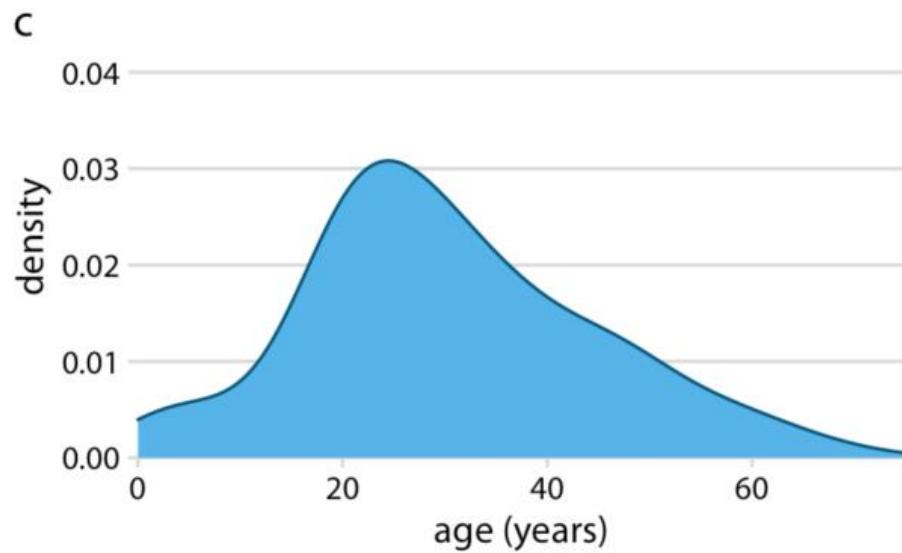
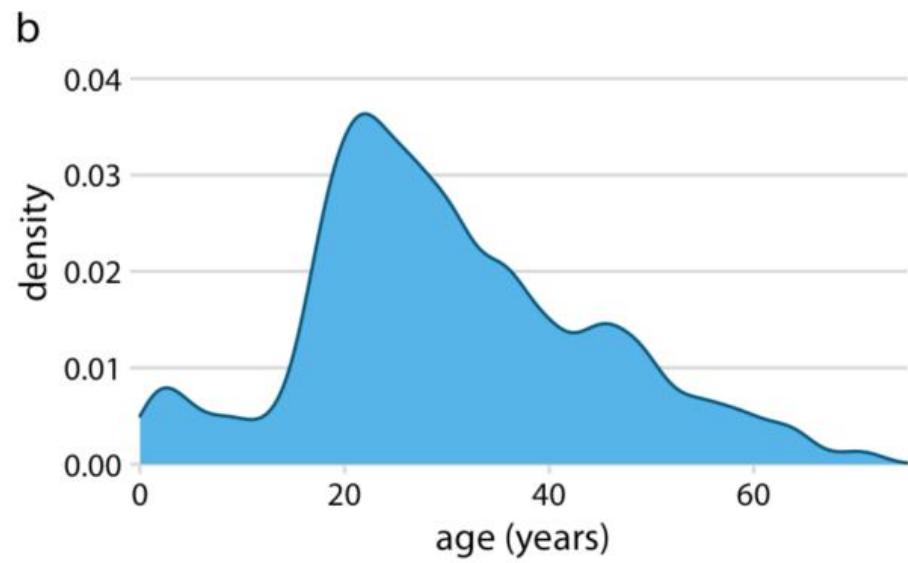
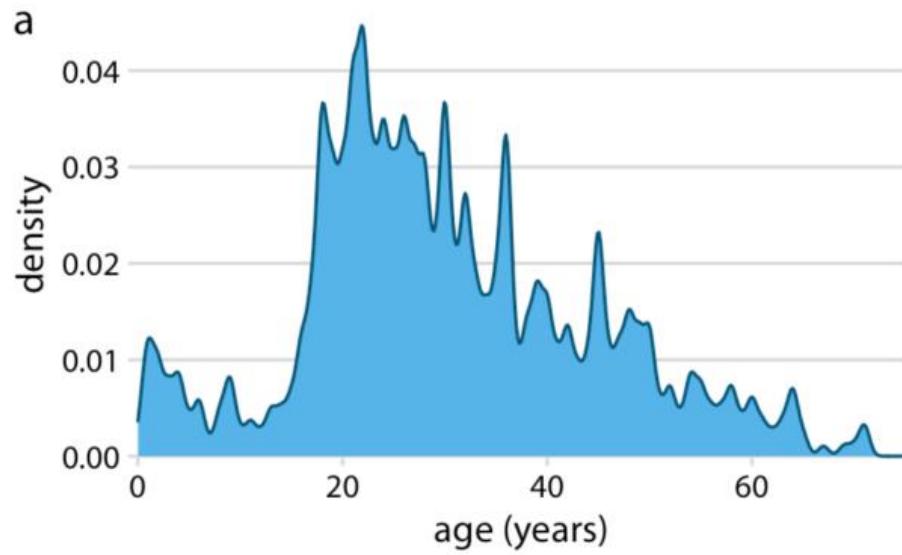
...

Age range	Count	Age range	Count	Age range	Count
0–5	36	31–35	76	61–65	16
6–10	19	36–40	74	66–70	3
11–15	18	41–45	54	71–75	3
16–20	99	46–50	50		
21–25	139	51–55	26		
26–30	121	56–60	22		











KEEP
CALM

TELL ME
WHAT TO DO



KEEP
CALM

TELL ME
WHAT TO DO

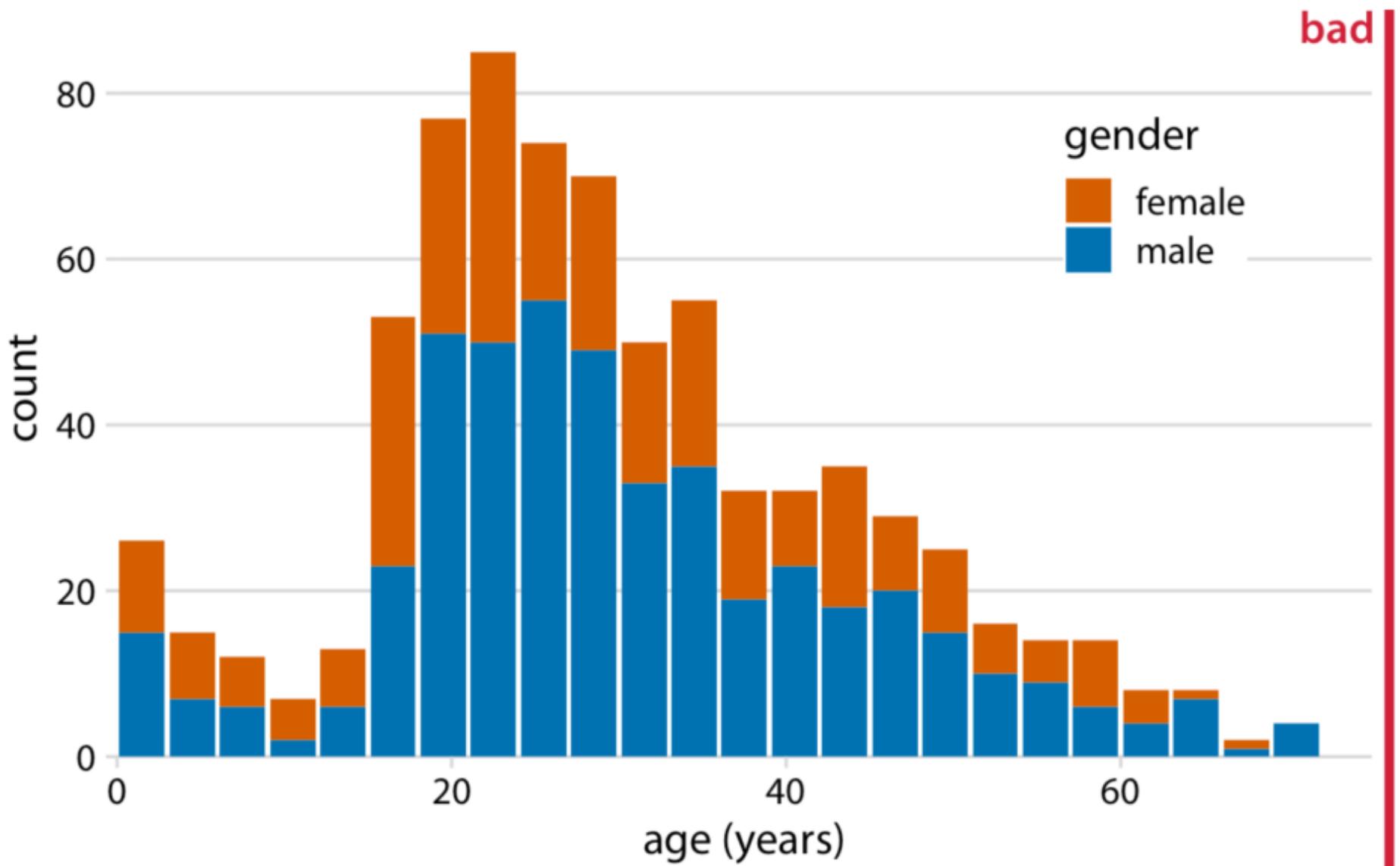
Tell me what to do!

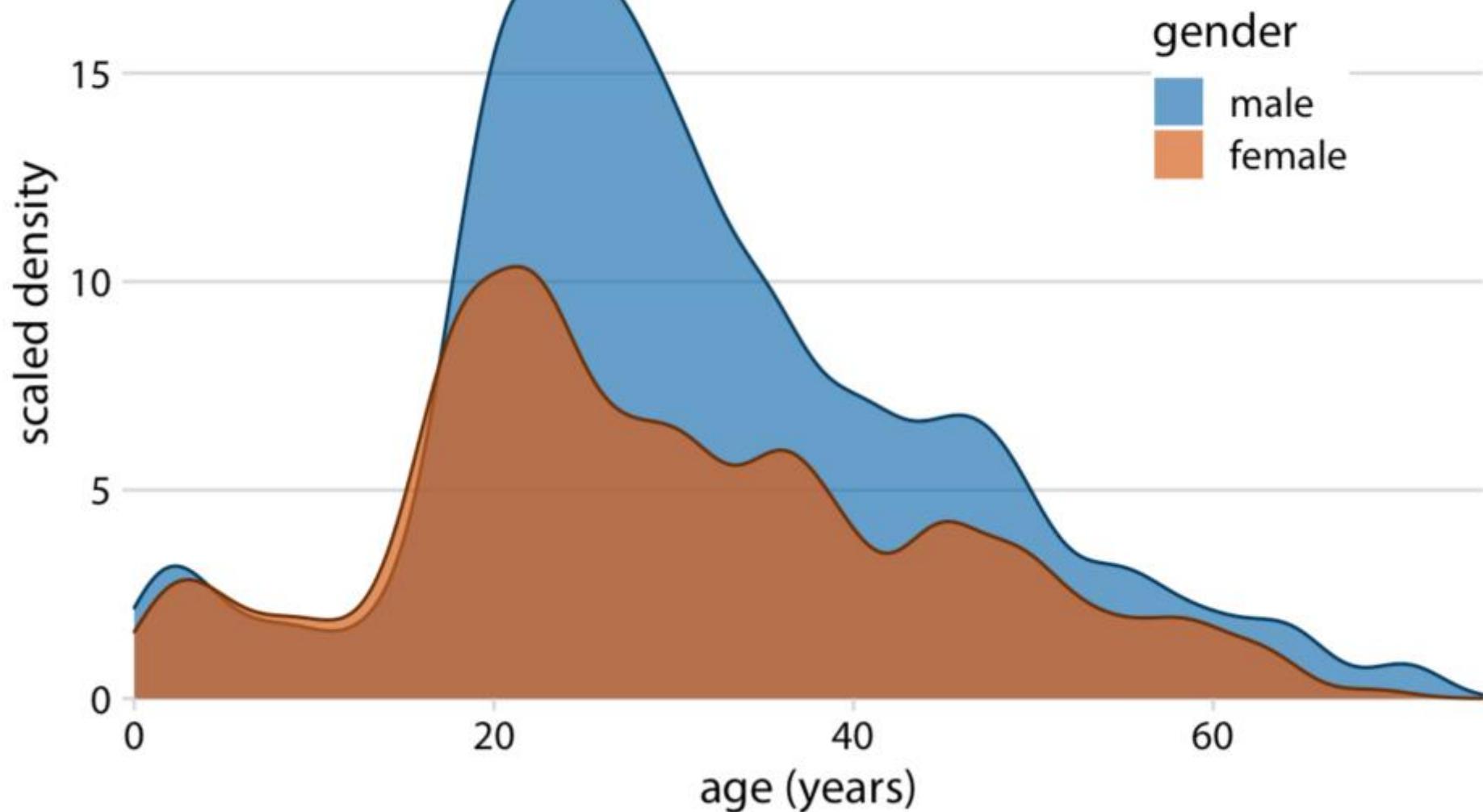


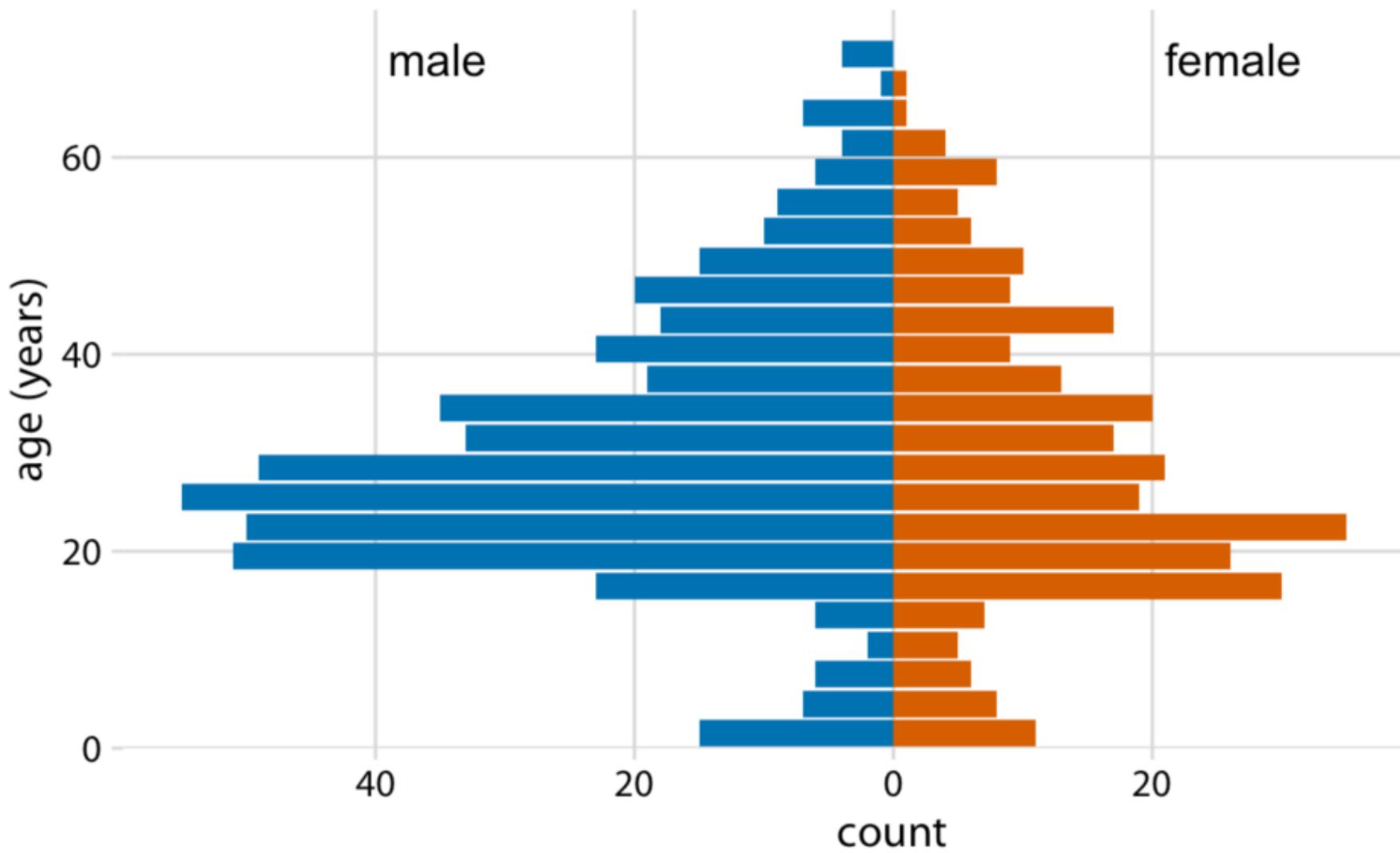
KEEP
CALM
TELL ME
WHAT TO DO

Represent the distributions for male and female passengers!

age	gender
30	M
25	M
2	F
47	M
47	F
62	F
39	M
53	M
71	F
47	F
18	M
...	

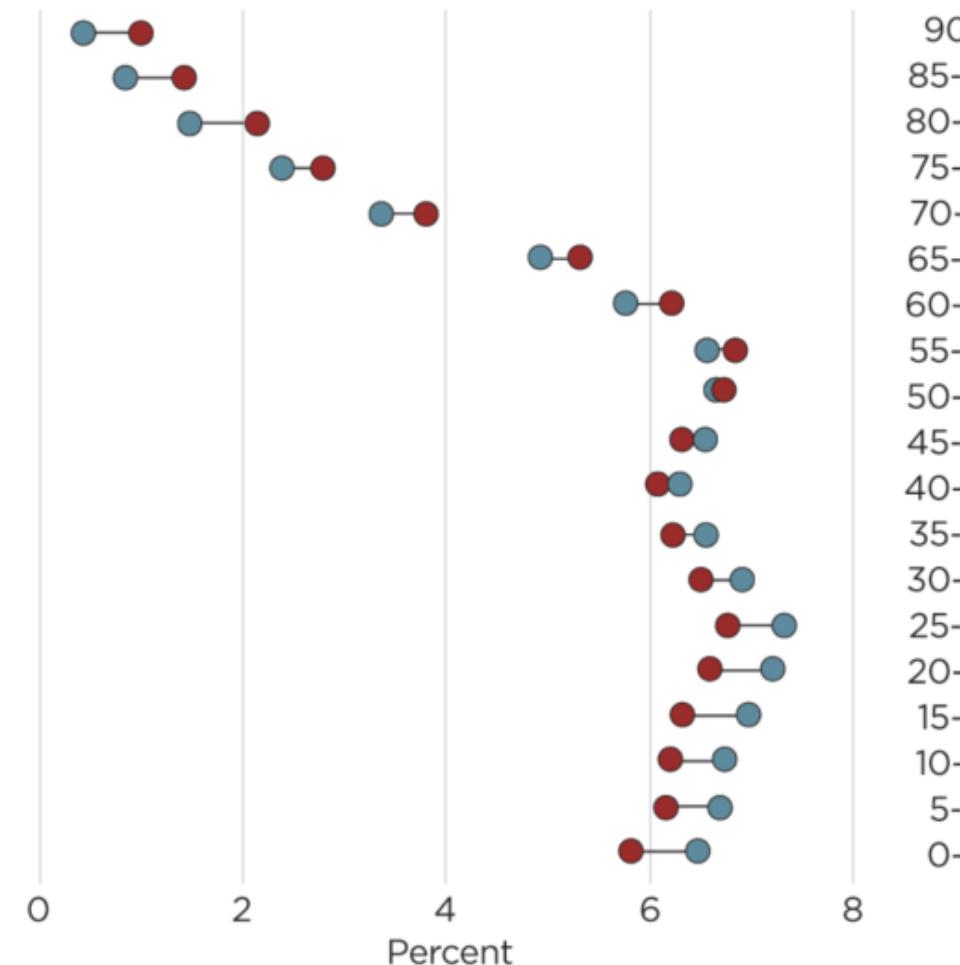






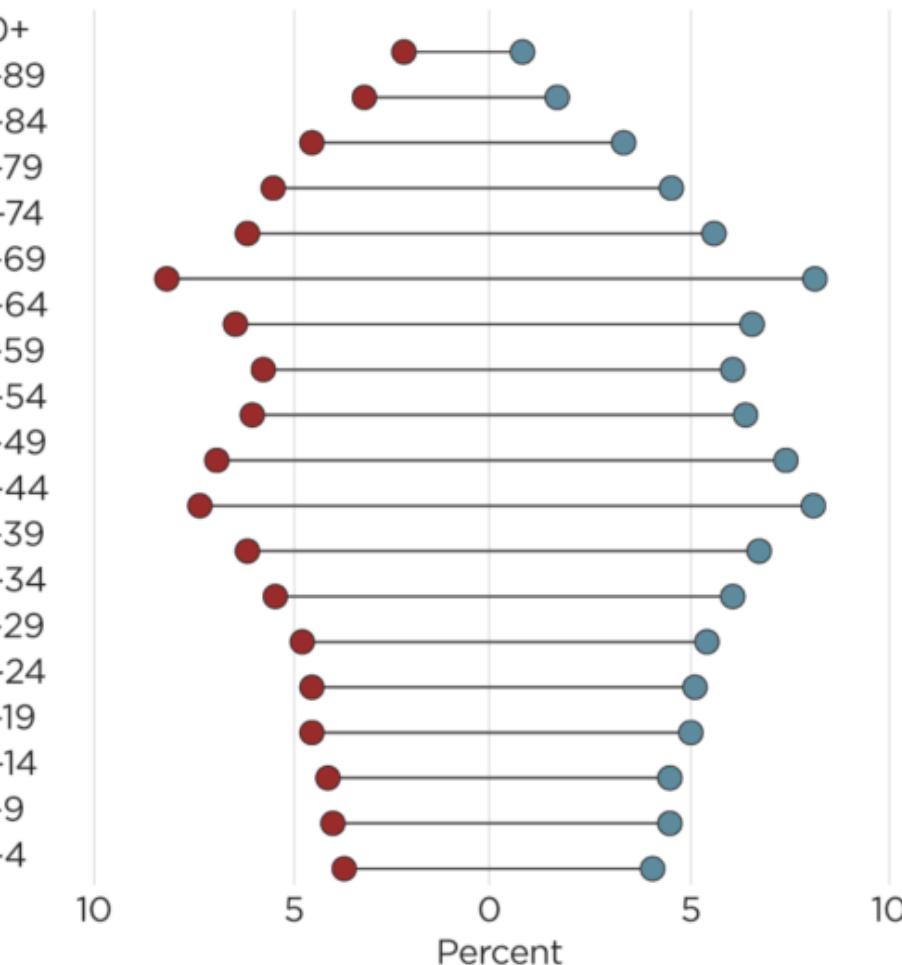
AGE DISTRIBUTION OF MEN AND WOMEN UNITED STATES, 2016

● US, Men ● US, Women



AGE DISTRIBUTION OF MEN AND WOMEN JAPAN, 2016

● Women ● Men



Source: United Nations



KEEP
CALM

TELL ME
WHAT TO DO



KEEP
CALM

TELL ME
WHAT TO DO

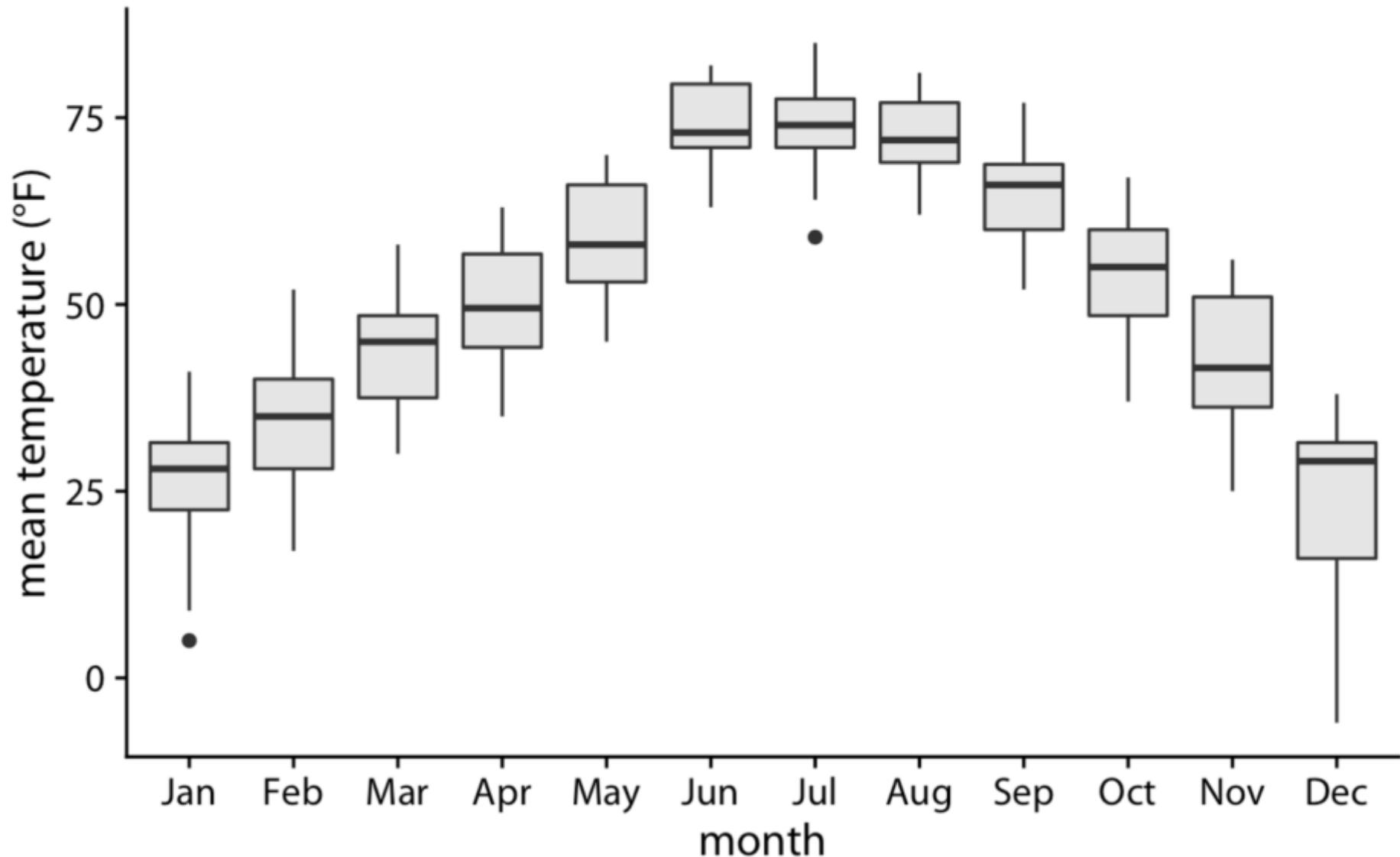
Tell me what to do!

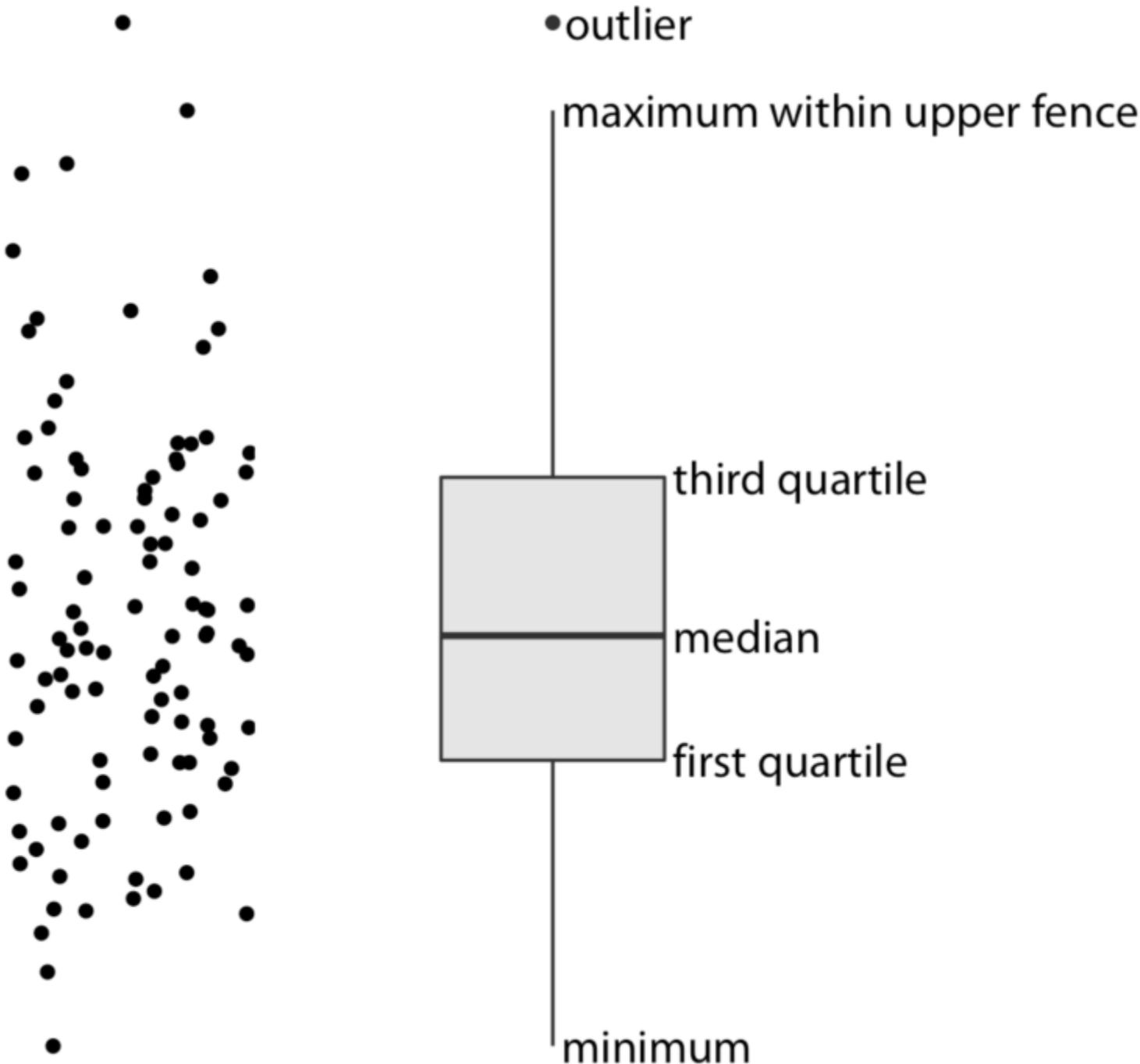


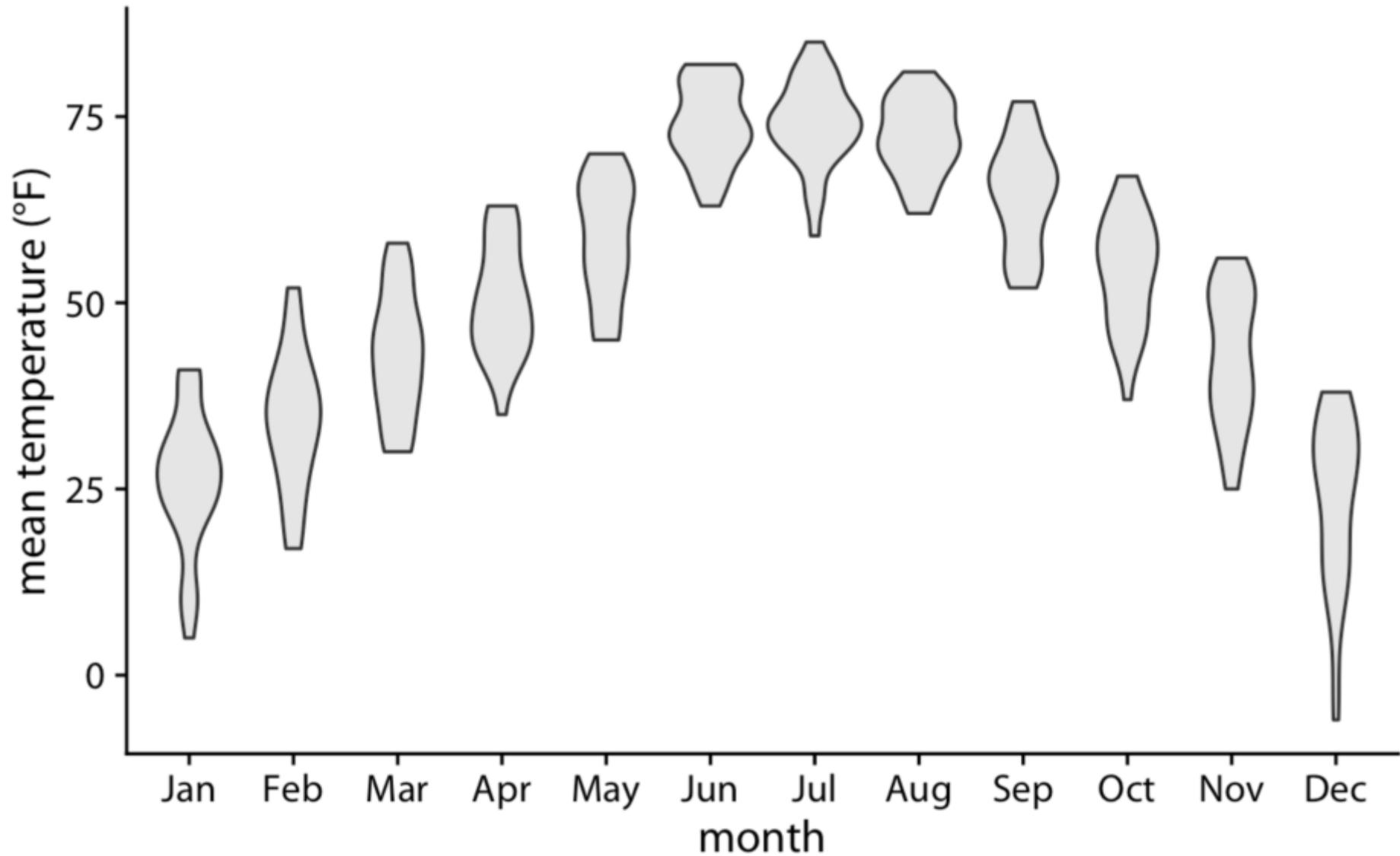
KEEP
CALM
TELL ME
WHAT TO DO

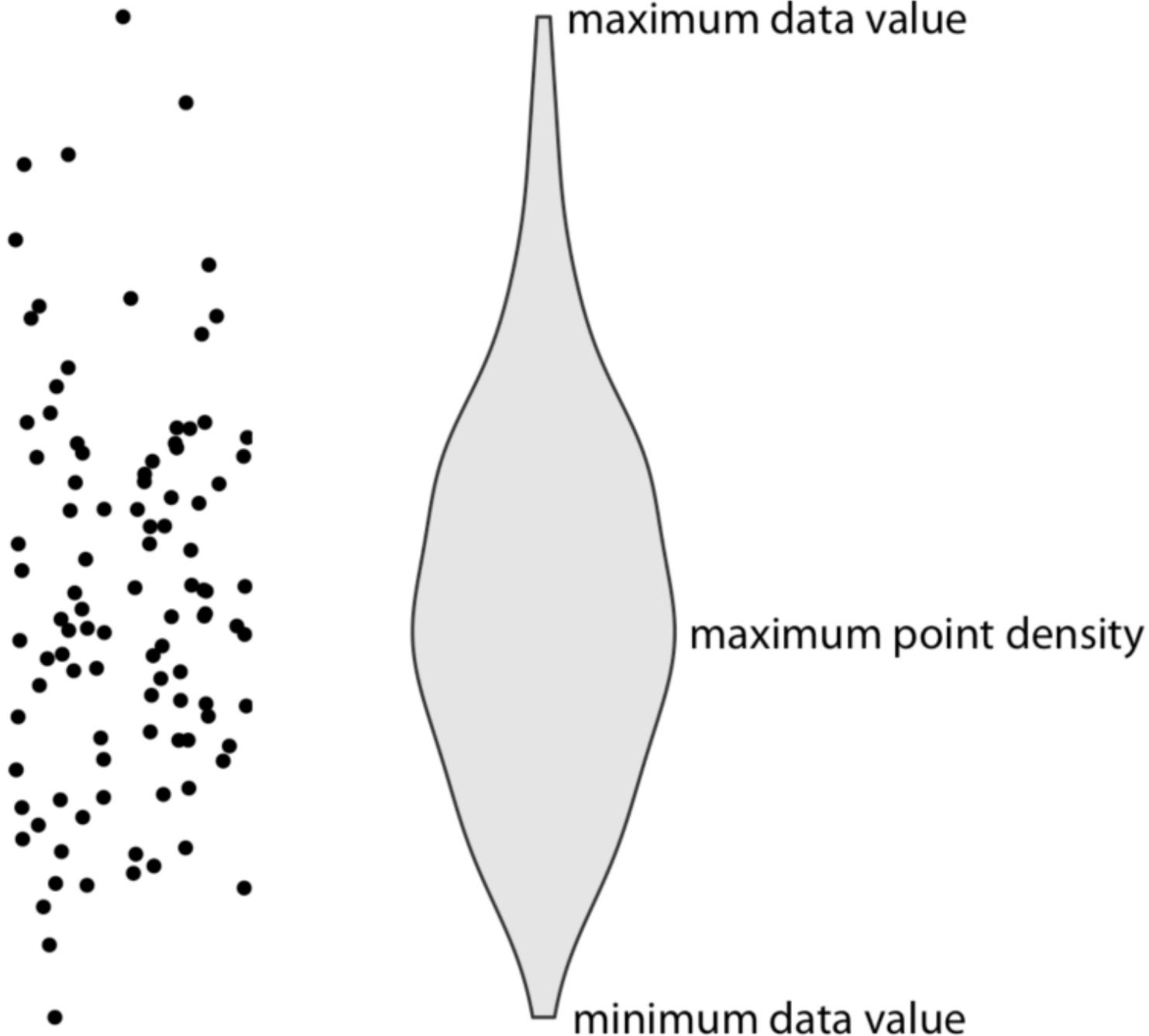
Mean daily temperatures in Lincoln, NE, 2016

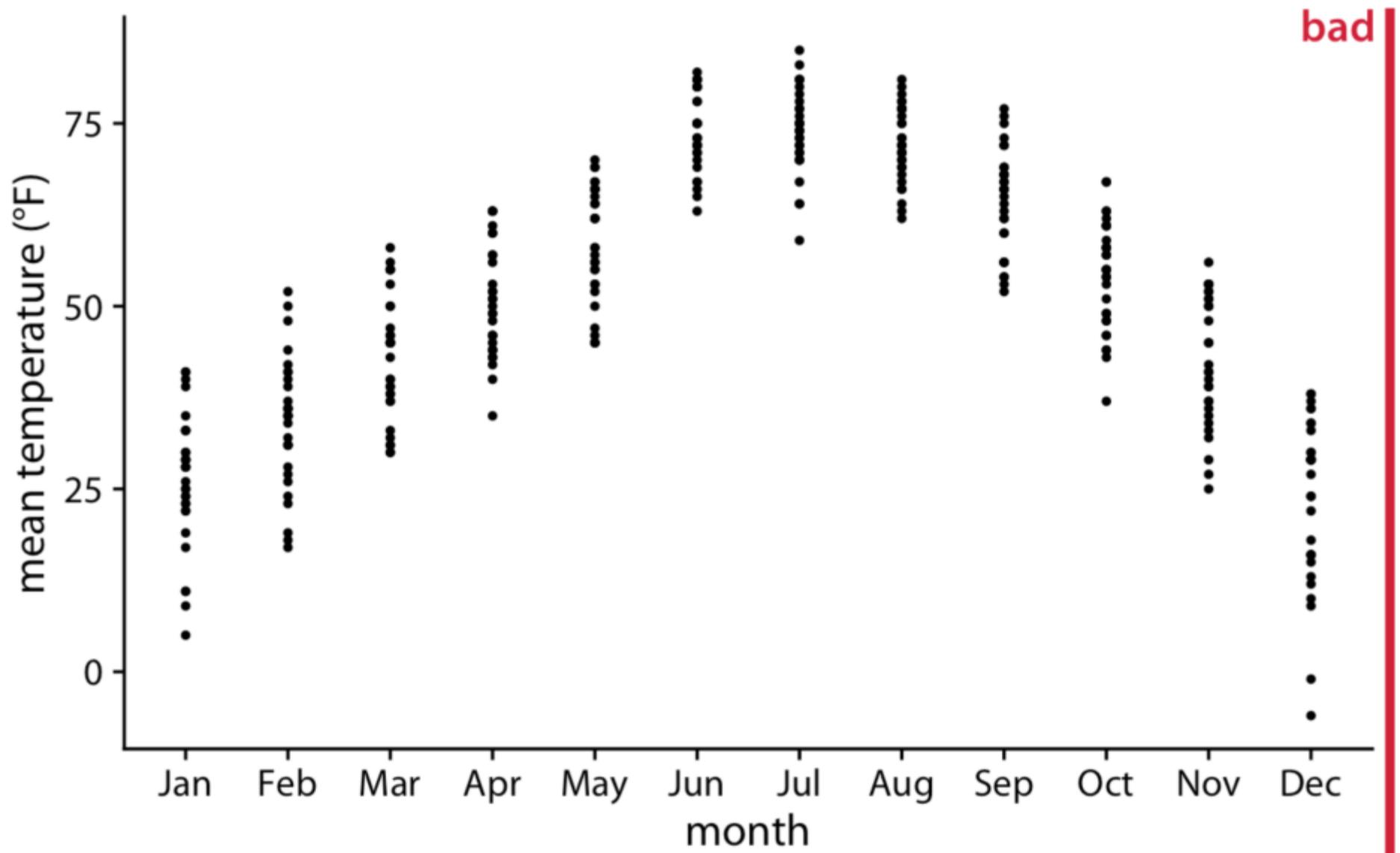
day	Temp
1-jan	5
2-jan	6
3-jan	3
4-jan	5
5-jan	6
...	
26-dec	4
27-dec	2
28-dec	6
29-dec	6
30-dec	1
31-dec	2

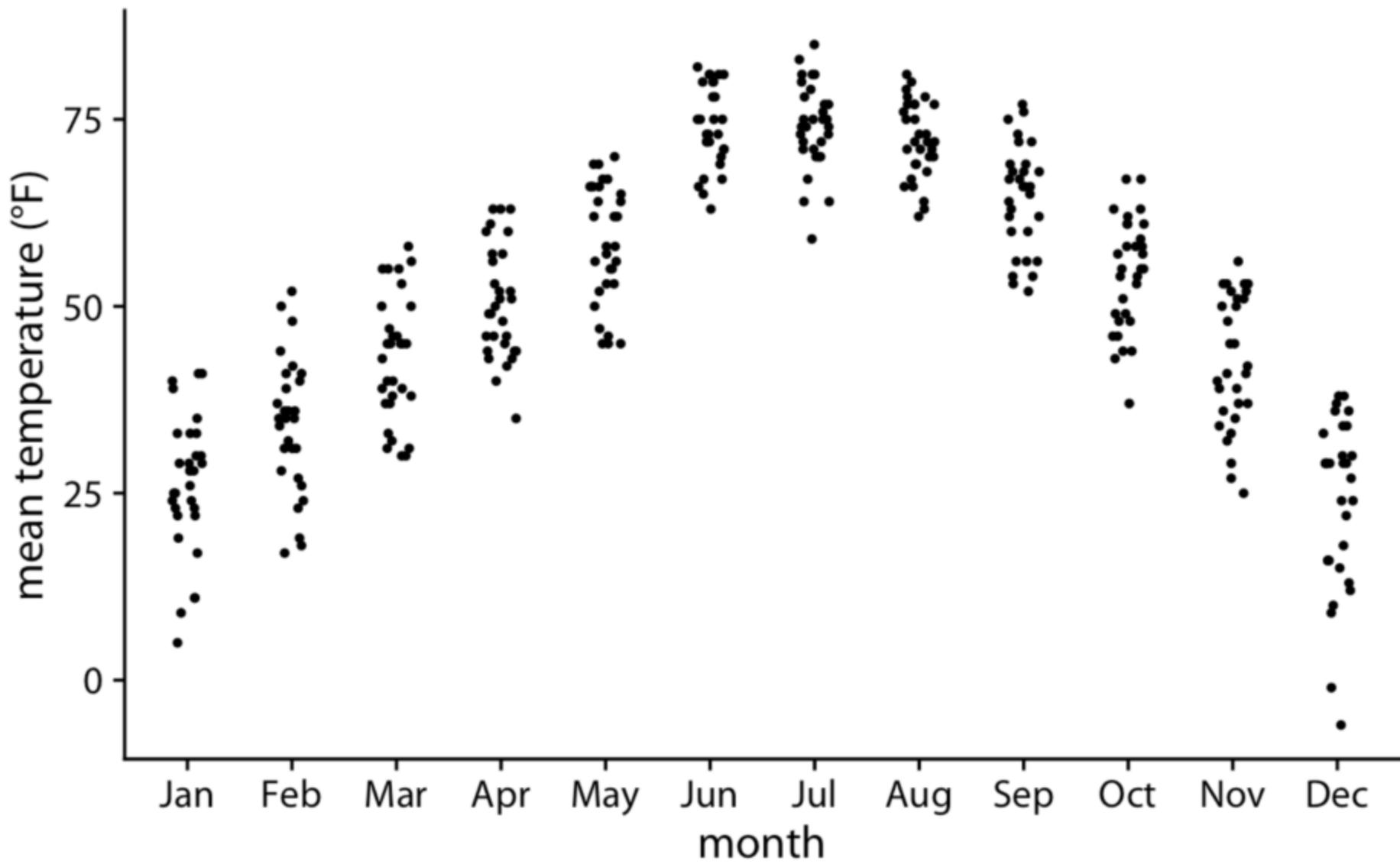


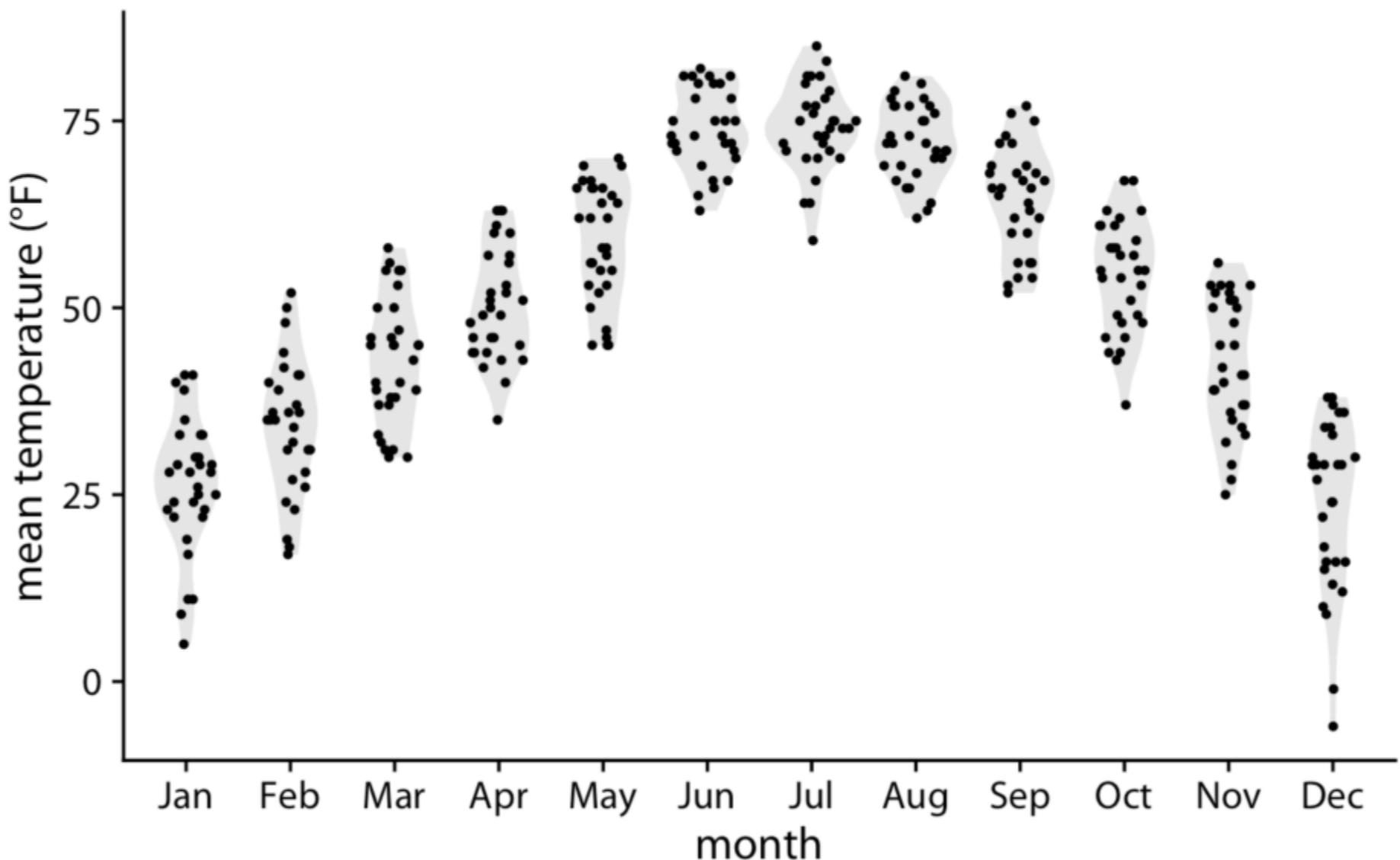




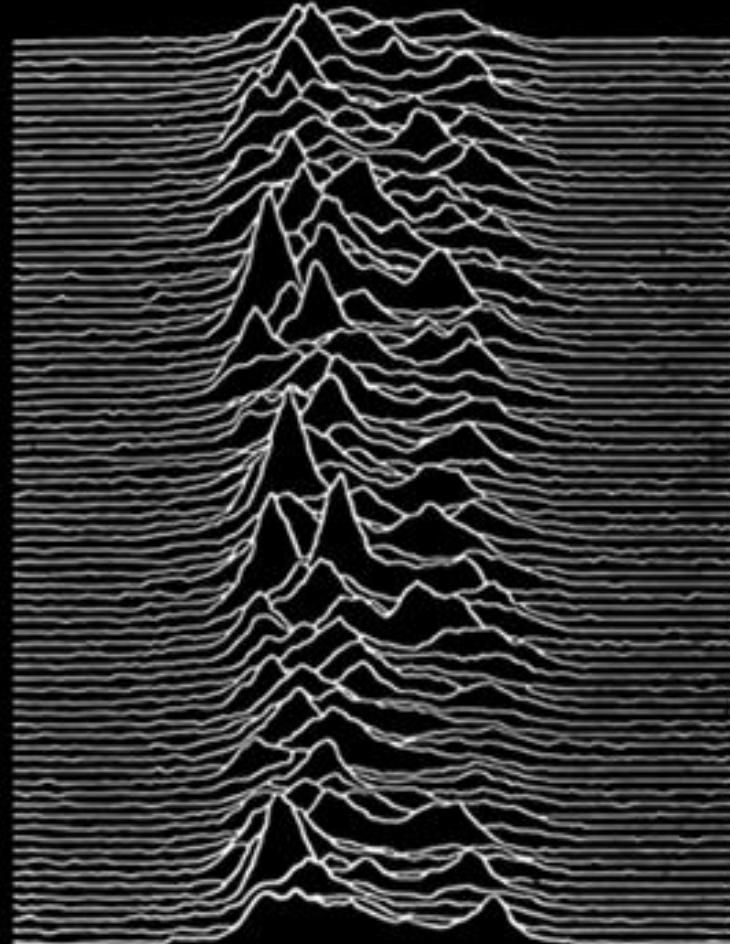




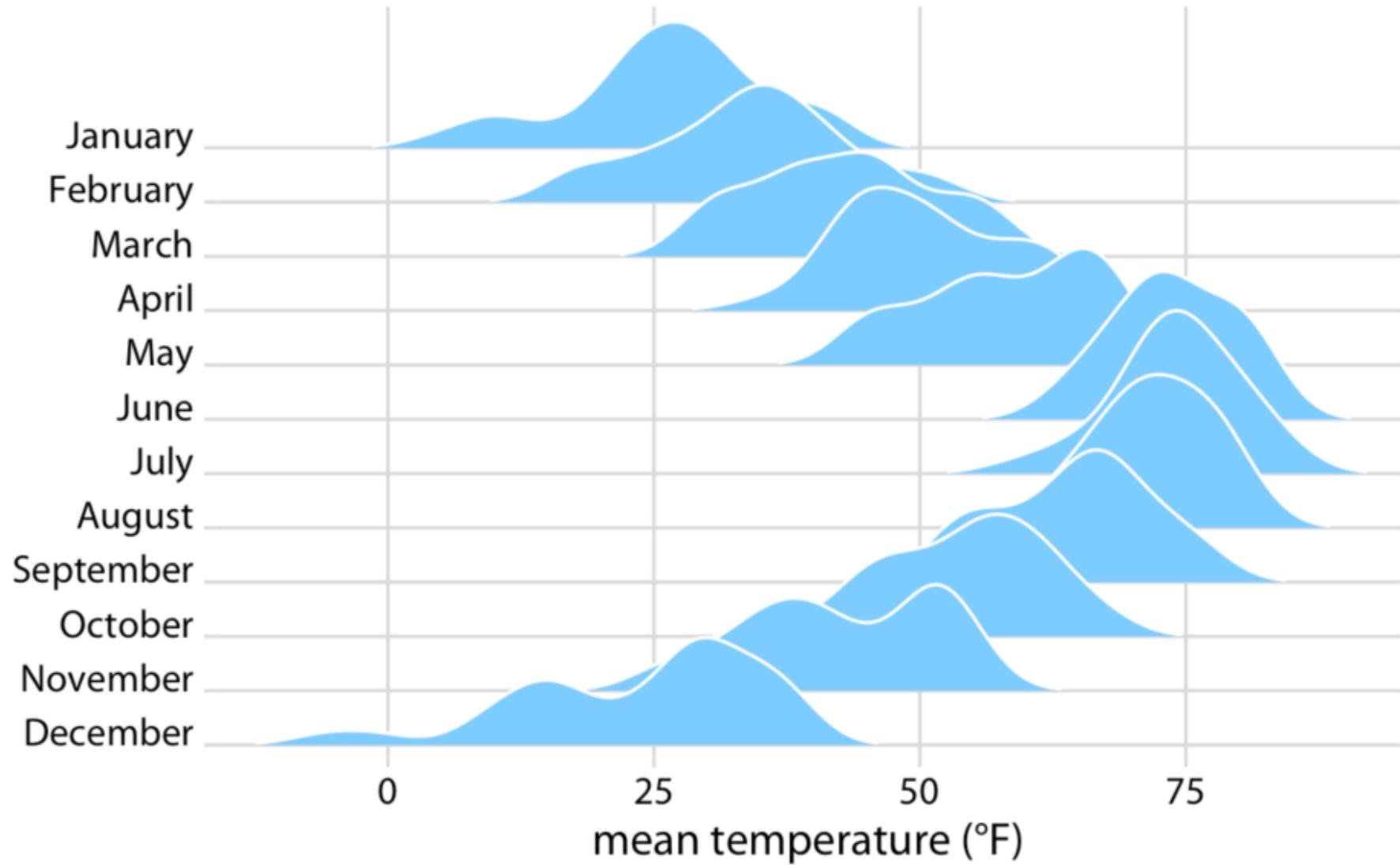


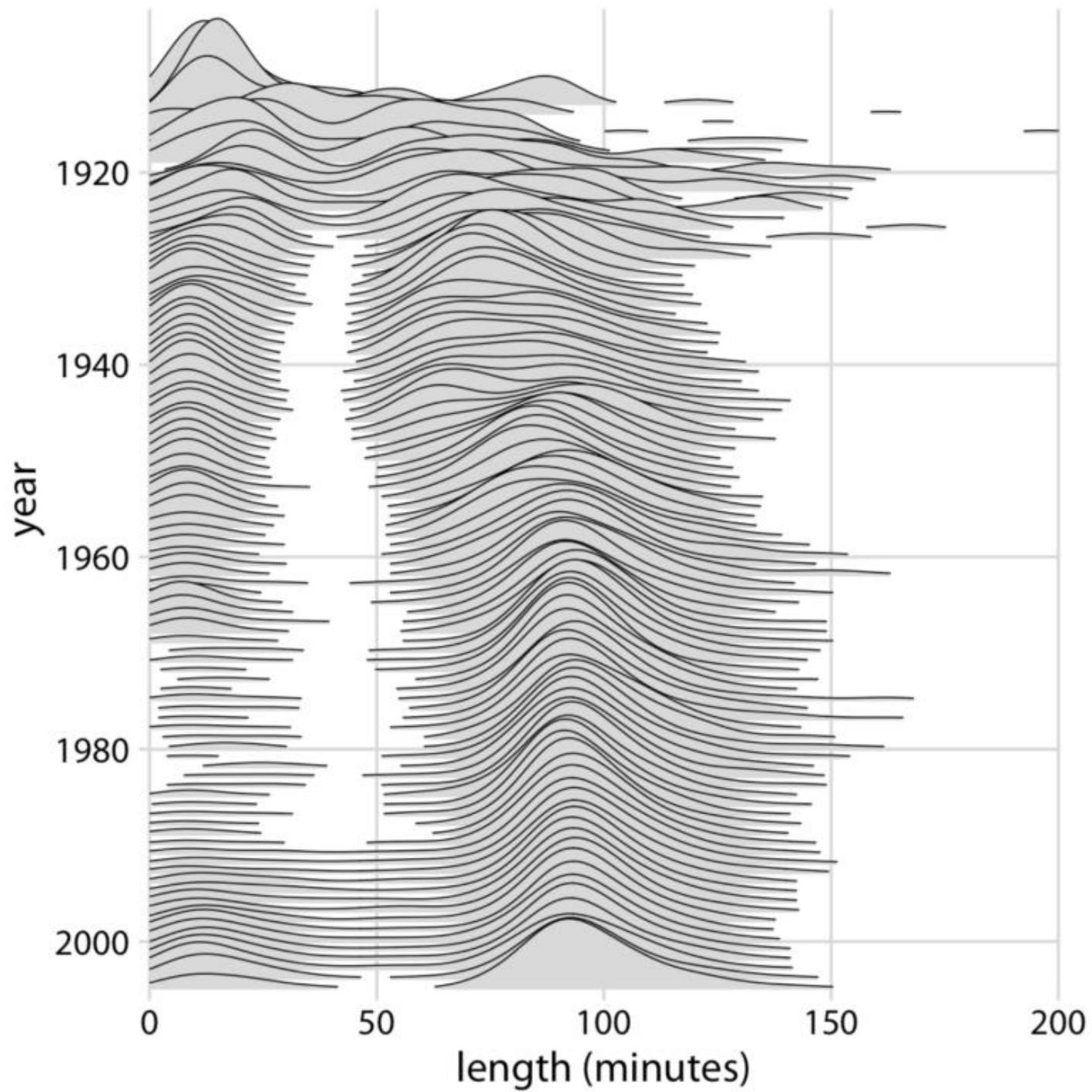


JOY DIVISION



UNKNOWN PLEASURES







KEEP
CALM

TELL ME
WHAT TO DO

02

PROPORTIONS



KEEP
CALM

TELL ME
WHAT TO DO

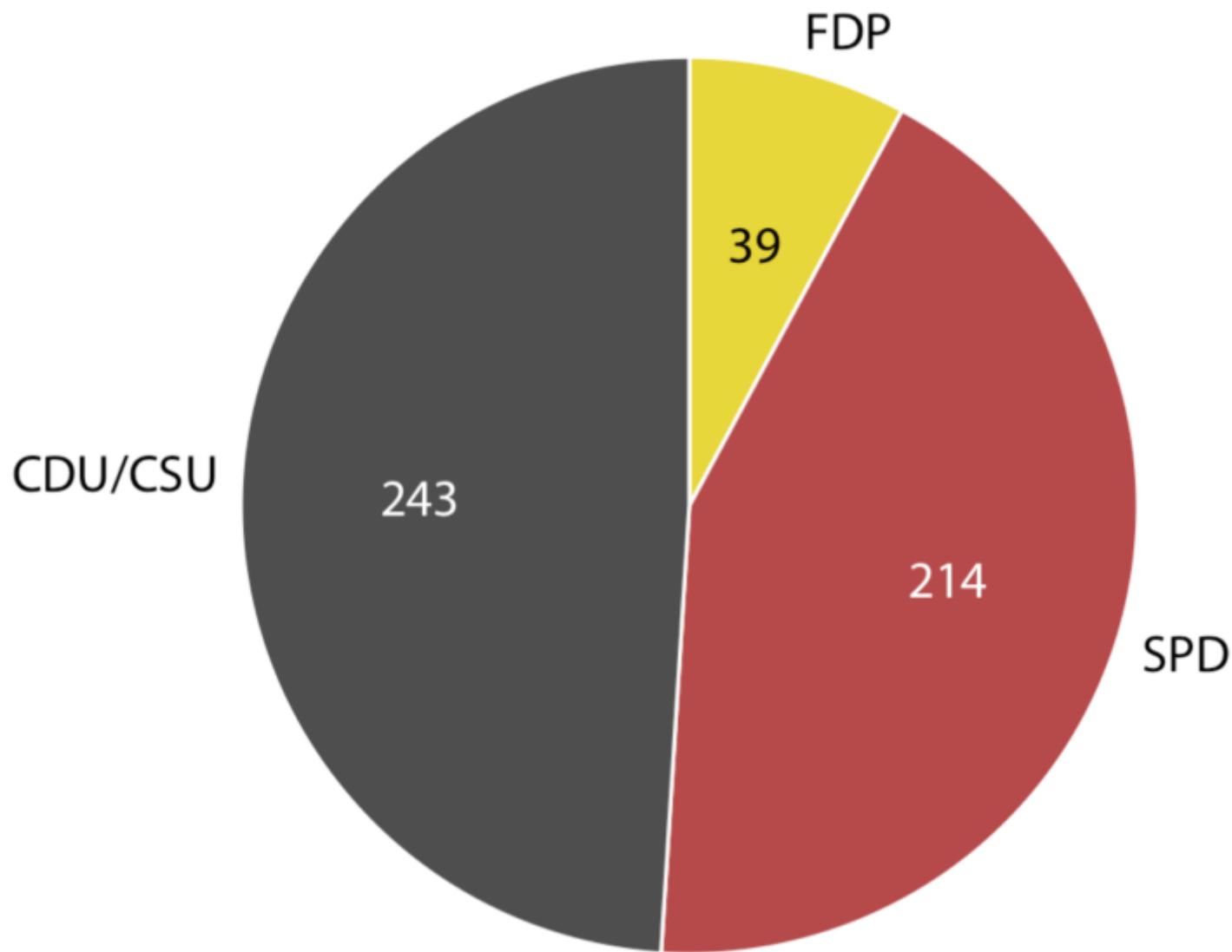
Tell me what to do!

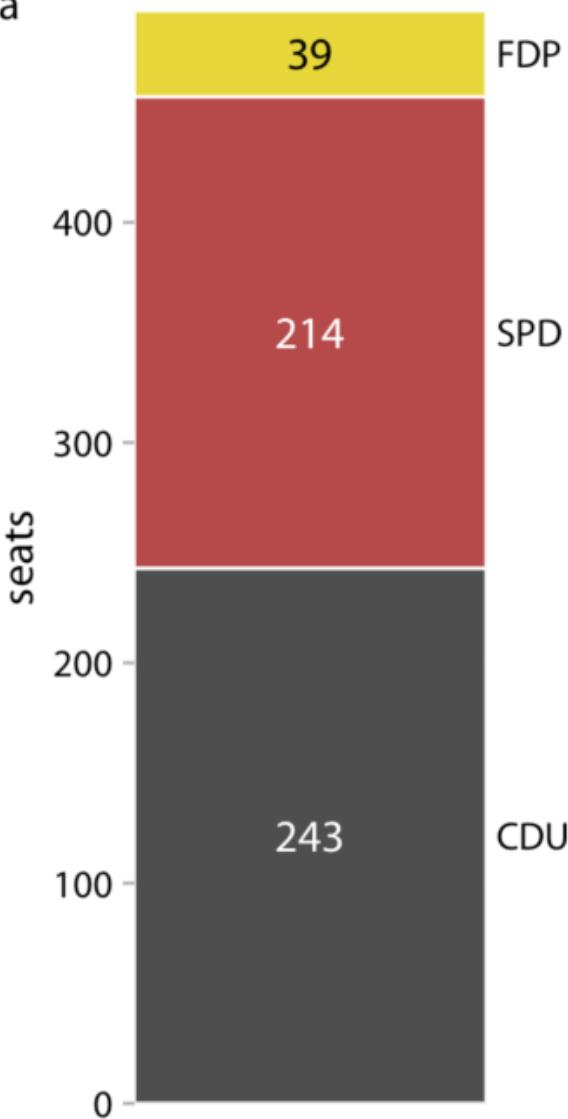
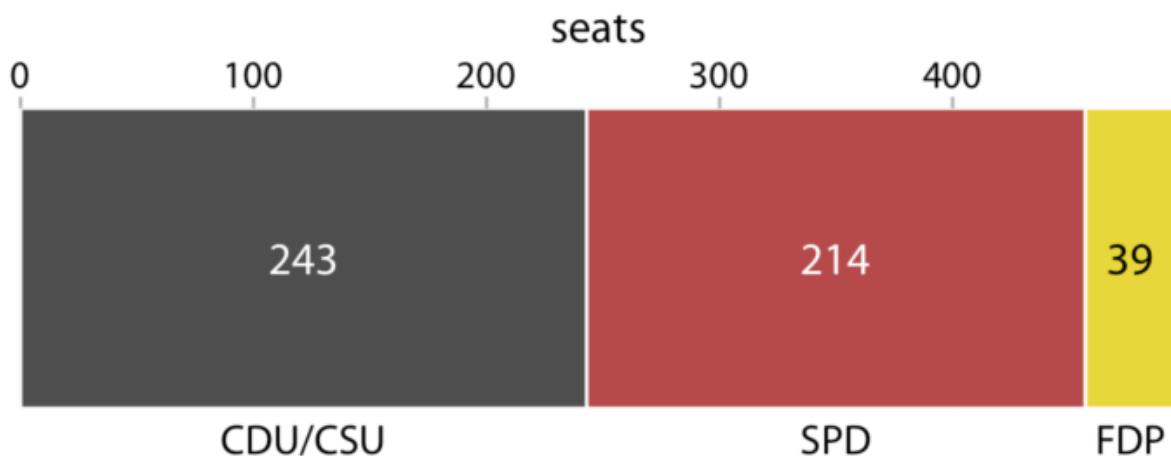


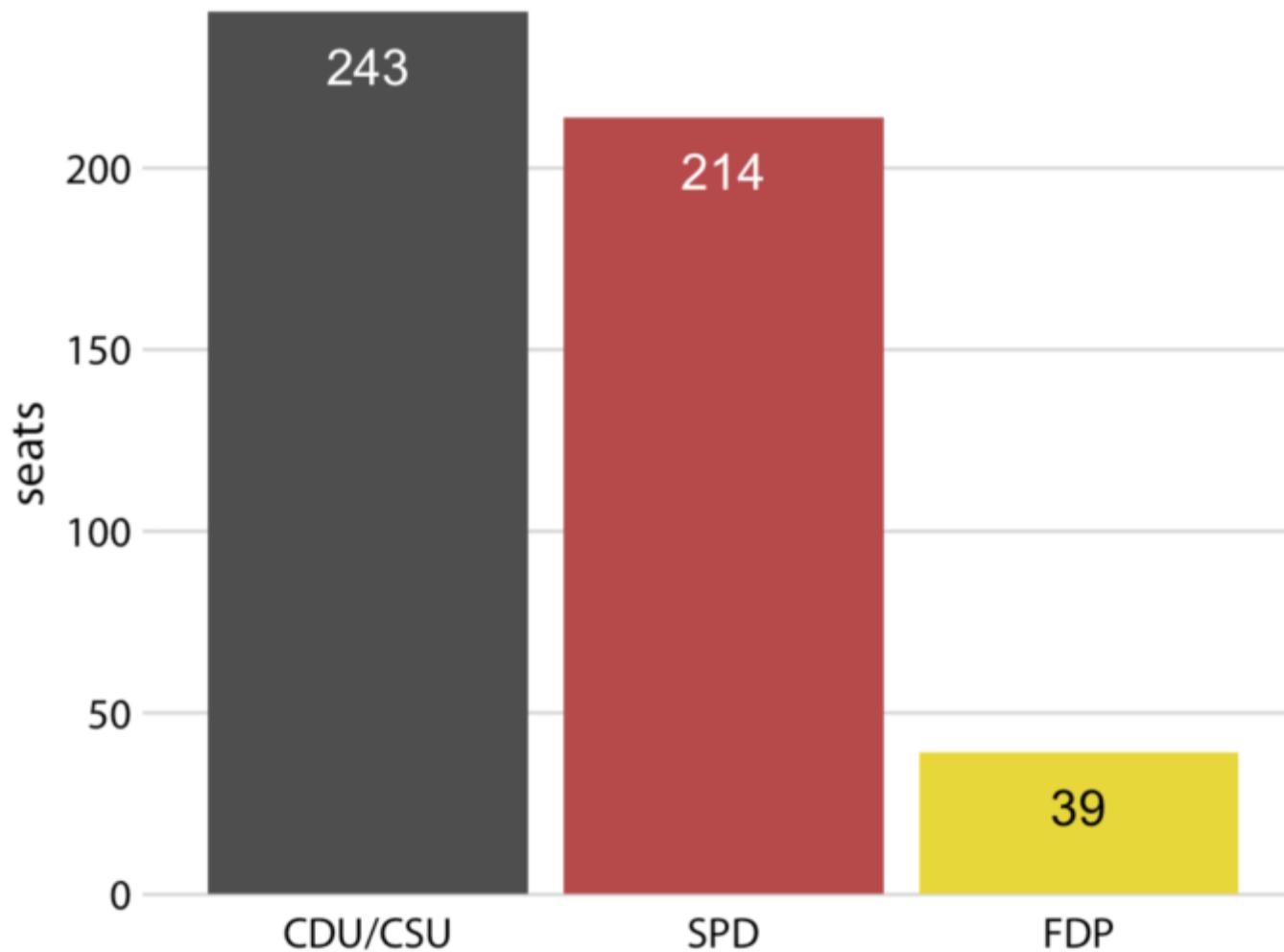
KEEP
CALM
TELL ME
WHAT TO DO

Seats in the *Bundestag* 1976-1980

Party	Seats
CDU/CSU	243
SPD	214
FDP	39



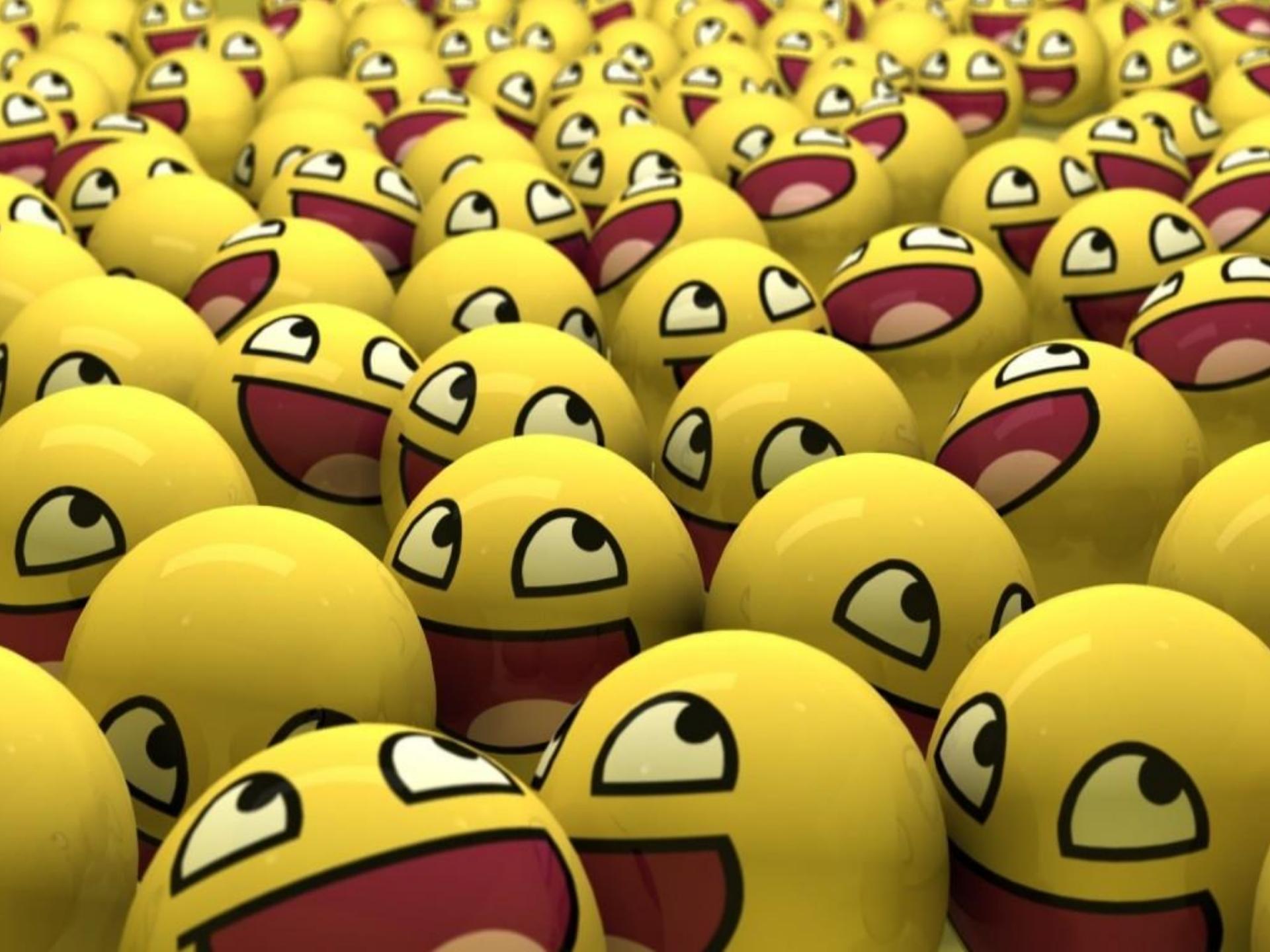
a**b**



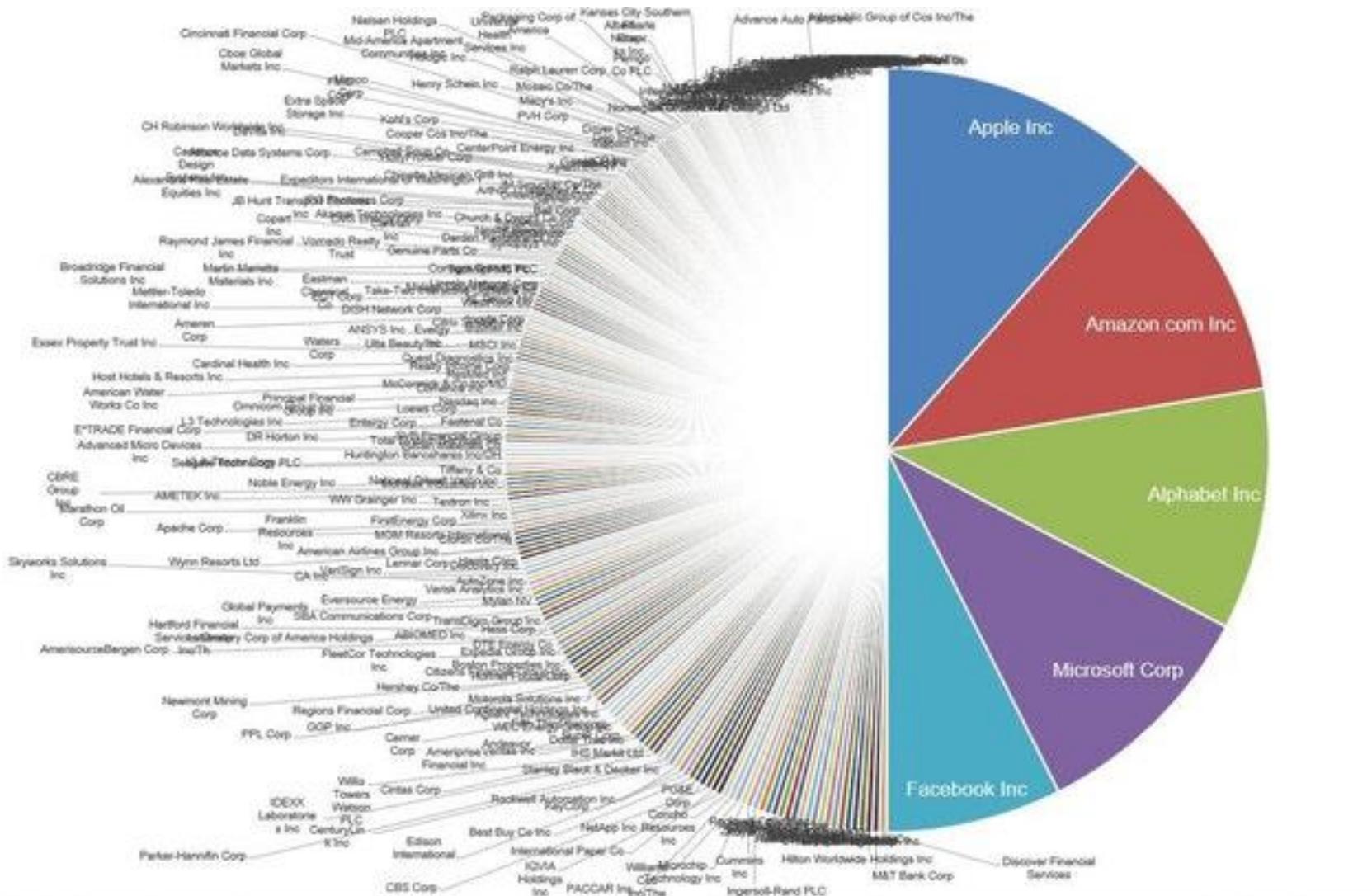


KEEP
CALM

TELL ME
WHAT TO DO



Couldn't make it up if I tried...



A cartoon illustration of a bald man with a large, bulbous nose. He is wearing a green turban and a purple feather in his hair. He has a mustache and is holding a white rectangular sign with both hands. The sign contains the text "THERE WILL NOW BE A BRIEF INTERMISSION".

**THERE WILL
NOW BE A
BRIEF
INTERMISSION**

LUCKY FELLAS



SRGRAFO

u/SrGrafo



THERE WILL
NOW BE A
BRIEF
INTERMISSION

GOOD or EVIL?

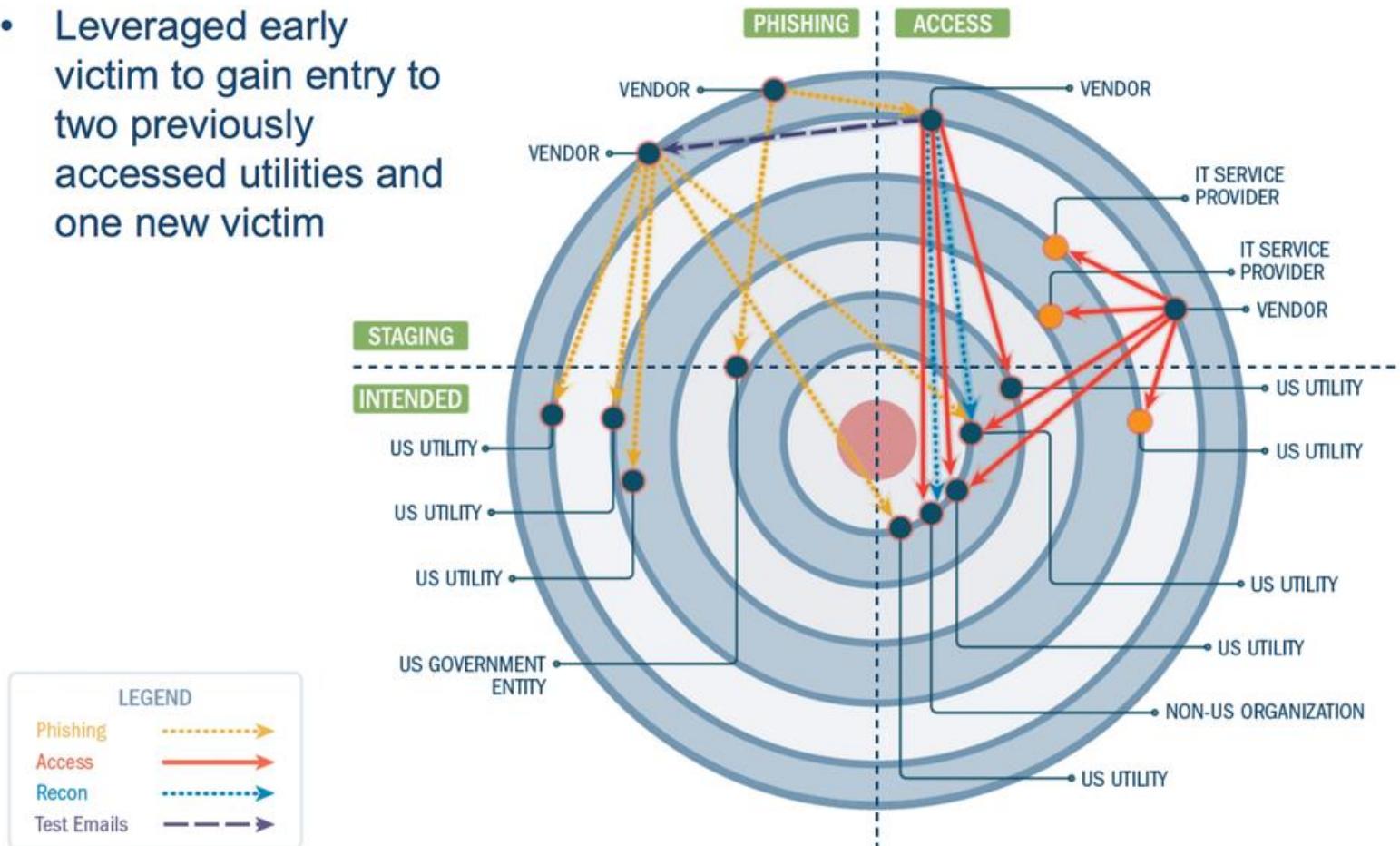


EXIBIT A

TLP:WHITE

Campaign Timeline

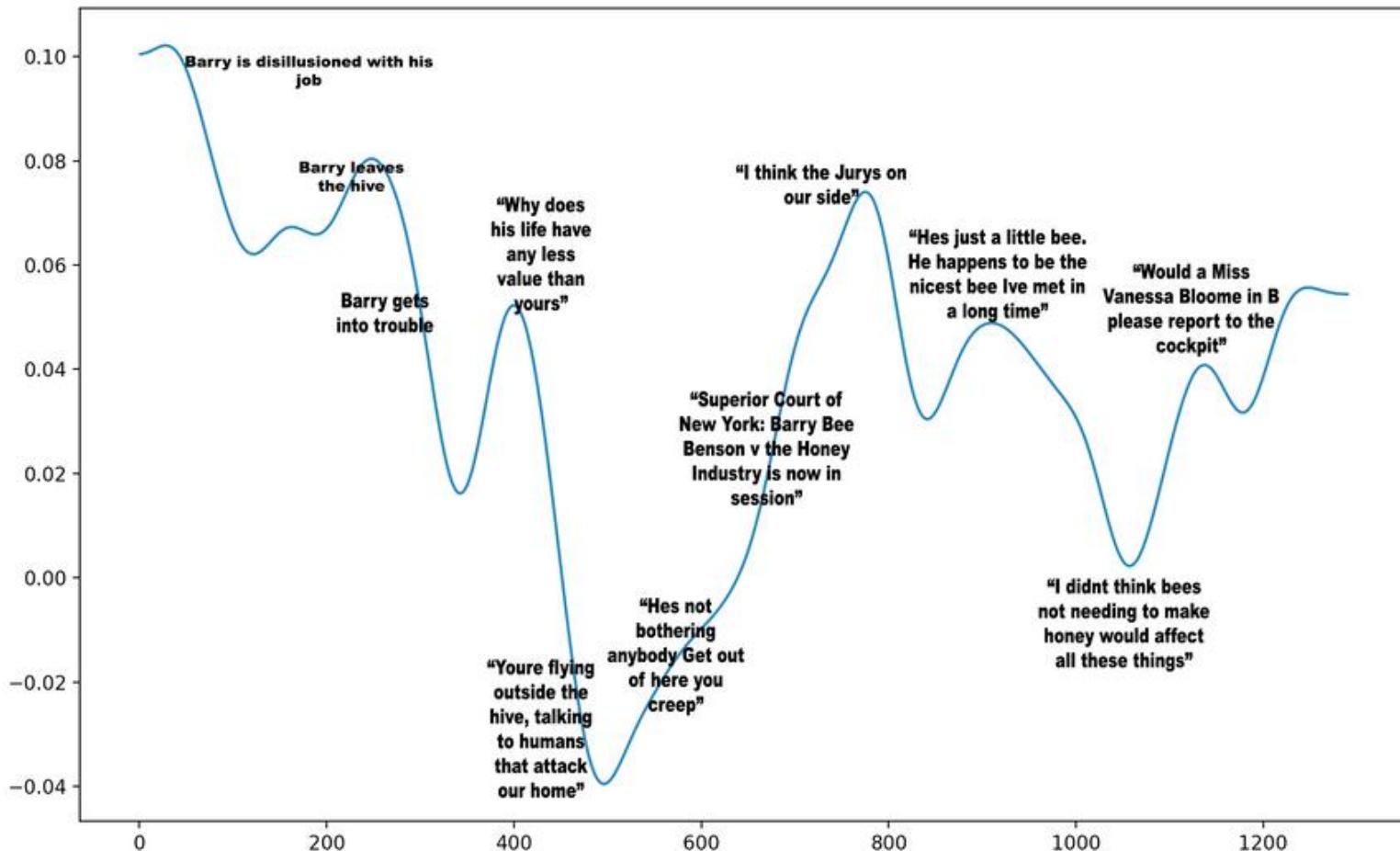
- Leveraged early victim to gain entry to two previously accessed utilities and one new victim



EXIBIT B

https://www.reddit.com/r/dataisbeautiful/comments/9n1044/bee_movie_plot_using_sentiment_analysis_oc/

Sentiment Analysis of the Bee Movie

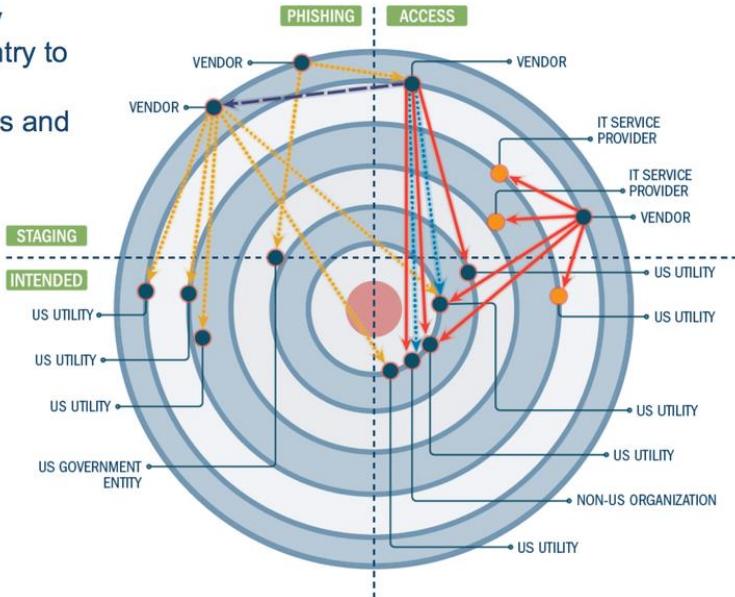


All Together Now!

A

Campaign Timeline

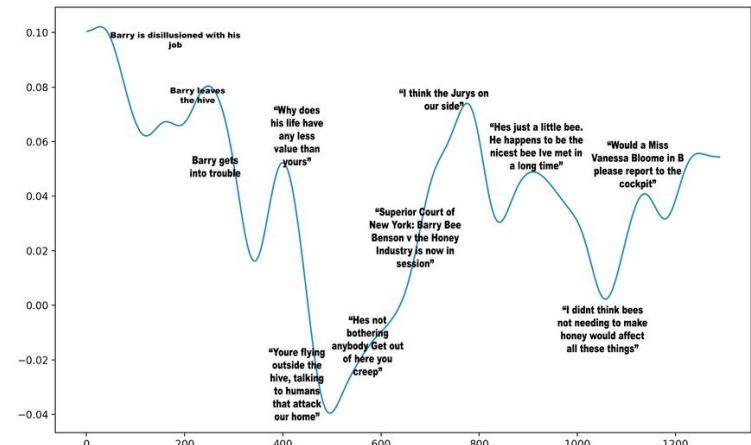
- Leveraged early victim to gain entry to two previously accessed utilities and one new victim



TLP:WHITE

B

Sentiment Analysis of the Bee Movie



03

REPRESENTING TIME

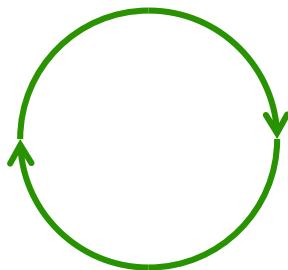
Choosing a Representation

<http://dougmccune.com/blog/2011/04/21/visualizing-cyclical-time-hour-of-day-charts/>

Inherently Linear



Inherently Cyclical



Cyclic or not?

day	participants
21/Set/2020	65
22/Set/2020	73
23/Set/2020	65
24/Set/2020	54
25/Set/2020	76
26/Set/2020	43
27/Set/2020	65
28/Set/2020	75
29/Set/2020	45
30/Set/2020	54

...



Cyclic or not?

day	participants
-----	--------------

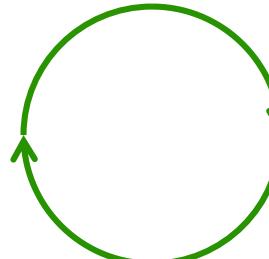
21/Set/2020	65
22/Set/2020	73
23/Set/2020	65
24/Set/2020	54
25/Set/2020	76
26/Set/2020	43
27/Set/2020	65
28/Set/2020	75
29/Set/2020	45
30/Set/2020	54

...

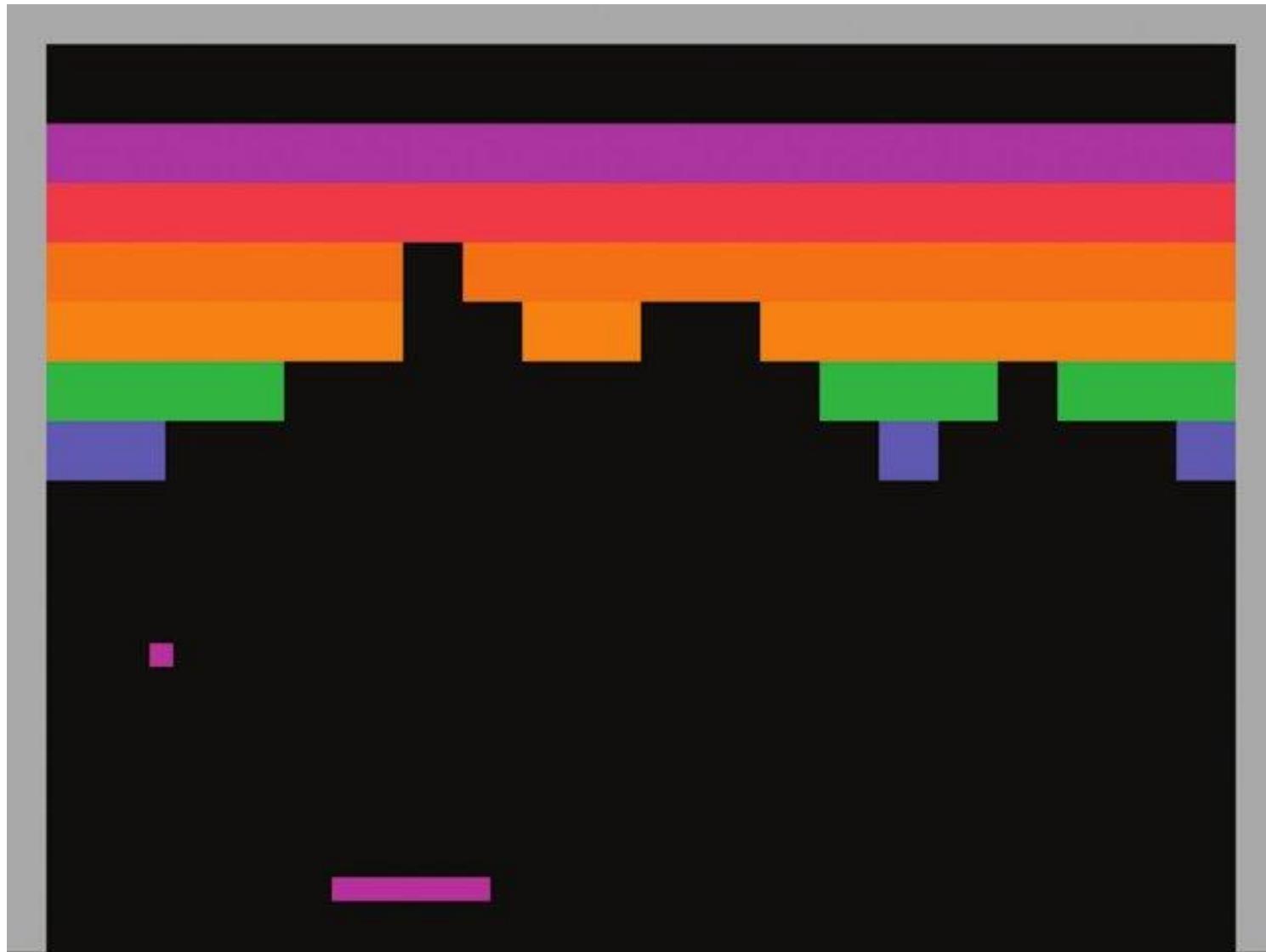
How did participant numbers evolve throughout the semester?



Do more people come to class on Mondays than on Thursdays?



Breakout!



Take a look at this one again

day participants

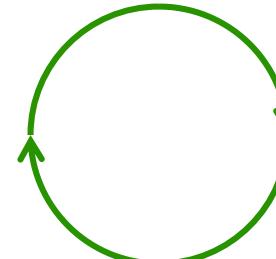
21/Set/2020	65
22/Set/2020	73
23/Set/2020	65
24/Set/2020	54
25/Set/2020	76
26/Set/2020	43
27/Set/2020	65
28/Set/2020	75
29/Set/2020	45
30/Set/2020	54

...

How did participant numbers evolve throughout the semester?



Do more people come to class on Mondays than on Thursdays?



Time to Break Out



Discuss among yourselves

For each task, sketch two ways to visualize the dataset (one for the linear question, another for the cyclic question)

Meet you back in 10 minutes!

<https://bit.ly/3BcTNbL>



Take a look at this one again

day participants

21/Set/2020	65
22/Set/2020	73
23/Set/2020	65
24/Set/2020	54
25/Set/2020	76
26/Set/2020	43
27/Set/2020	65
28/Set/2020	75
29/Set/2020	45
30/Set/2020	54

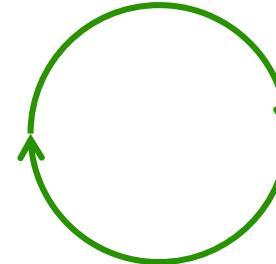
...

10:00

How did participant numbers evolve throughout the semester?



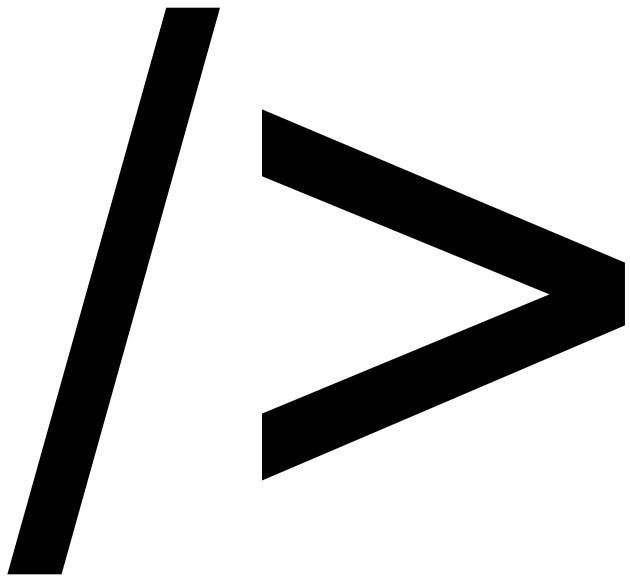
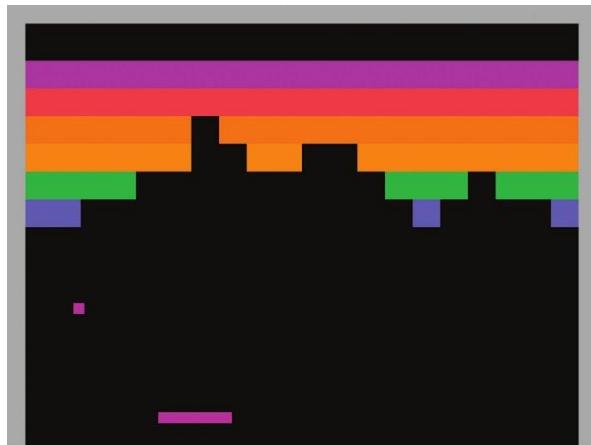
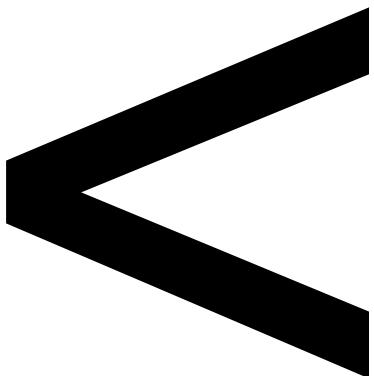
Do more people come to class on Mondays than on Thursdays?



<https://bit.ly/3BcTNbL>



Breakout Over!





KEEP
CALM

TELL ME
WHAT TO DO

Tell me what to do!



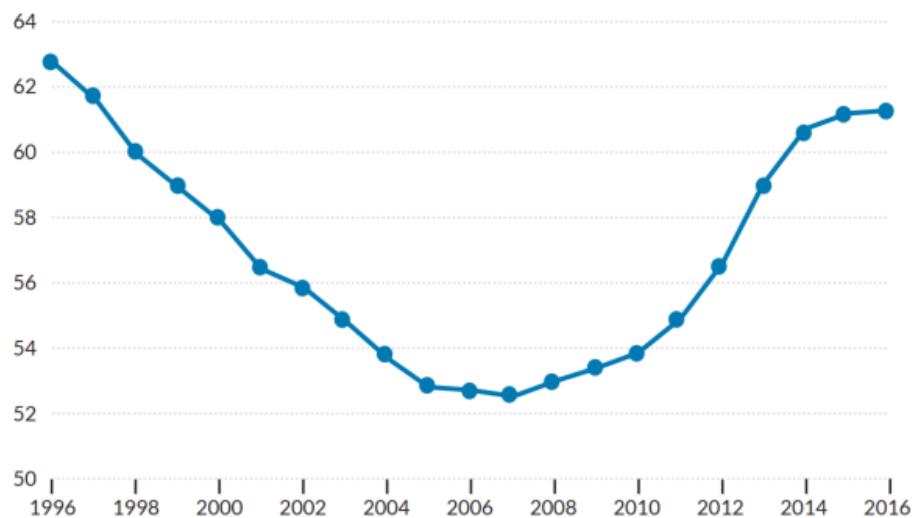
KEEP
CALM
TELL ME
WHAT TO DO

Two data-series for South Africa!
Represent time in a single viz!

Year	Life expect.	GDP per capita
1996	3864	61
1997	3930	59
1998	3502	58
1999	3417	57
2000	3374	56
2001	2971	55
2002	2797	54
2003	4217	54
2004	5409	53
2005	6033	53
2006	6266	54

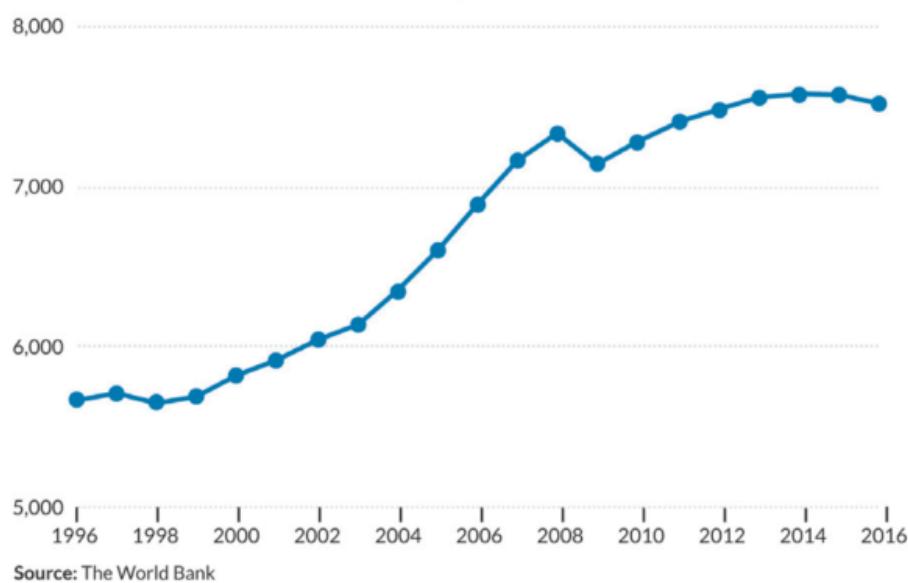
Year	Life expect.	GDP per capita
2007	6780	54
2008	6350	55
2009	6532	56
2010	8149	58
2011	8810	59
2012	8222	60
2013	7467	61
2014	6988	62
2015	6259	63
2016	5757	63

Life expectancy in South Africa fell and then increased from 1996 to 2016



Source: The World Bank

Per capita GDP in South Africa has grown since 1996



Source: The World Bank

8,000

7,000

6,000

5,000

Higher per capita GDP
↑

Lower per capita GDP
↓

2016

Beginning in 2008, life expectancy started rising and GDP growth slowed

Between 1996 and 2007, life expectancy fell and GDP rose

50

52

54

56

58

60

62

64

← Lower life expectancy

Life expectancy

Higher life expectancy →

1996





KEEP
CALM

TELL ME
WHAT TO DO

Get Inspired!

<https://vcg.informatik.uni-rostock.de/~ct/timeviz/timeviz.html>

The TimeViz Browser

A Visual Survey of Visualization Techniques for Time-Oriented Data
by Christian Tominski and Wolfgang Aigner

of Techniques: 115

Search:

How to use filters:

- Want:** Show me!
- Indifferent:** I don't care.
- Hide:** I'm not interested!

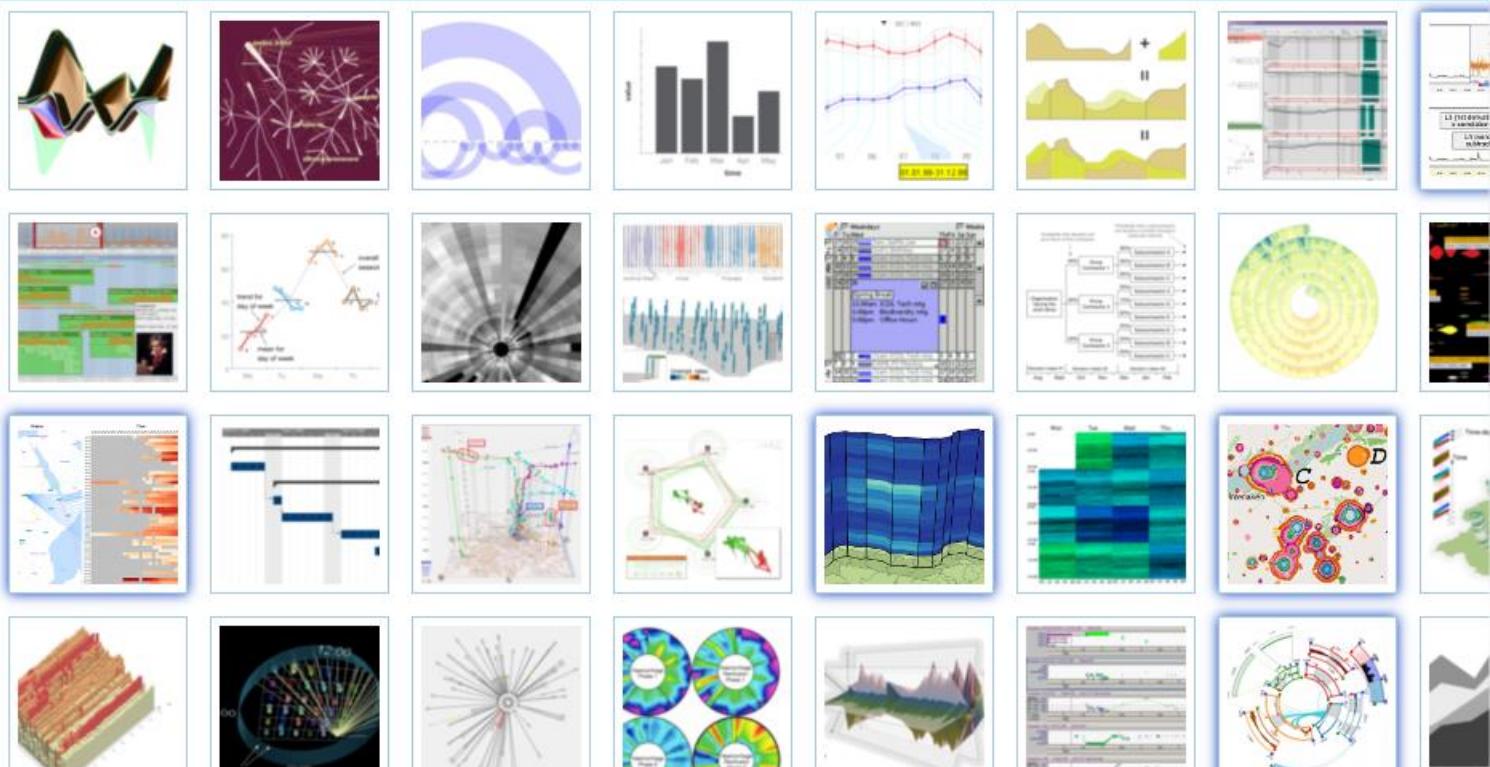
Data

Frame of Reference

- Abstract
- Spatial

Number of Variables

- Univariate
- Multivariate



QUESTIONS?