

Midterm:

- Oct 11 based on votes***
- Cumulative, 120-point, no harmful curves***
- Collaboration incentive:***
 - Pick the question you're most unsure of.***
 - Write the name of someone who knows it.***
 - If they get it right, you both get points.***
- You may share study guides/flash cards beforehand.***



tables of data

Arrange Tables

➔ Express Values

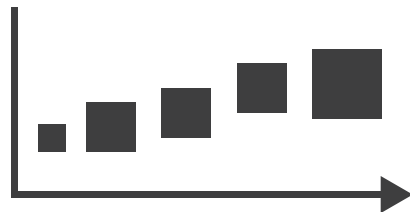


➔ Separate, Order, Align Regions

➔ Separate



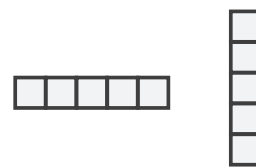
➔ Order



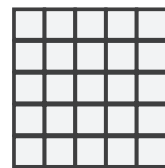
➔ Align



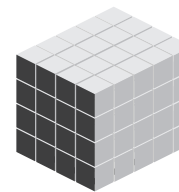
➔ 1 Key
List



➔ 2 Keys
Matrix



➔ 3 Keys
Volume

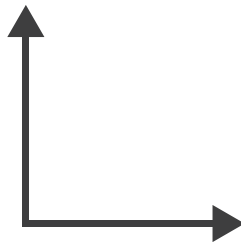


➔ Many Keys
Recursive Subdivision



➔ Axis Orientation

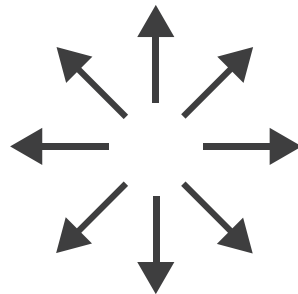
➔ Rectilinear



➔ Parallel

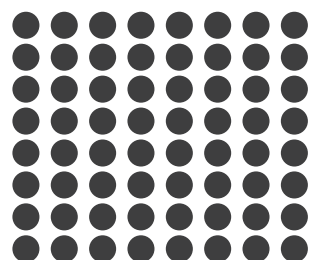


➔ Radial



➔ Layout Density

➔ Dense



➔ Space-Filling



*Arrange means
manipulating
space*

Channels: Expressiveness Types and Effectiveness Ranks

➔ **Magnitude** Channels: **Ordered** Attributes

Position on common scale



Position on unaligned scale



Length (1D size)



Tilt/angle



Area (2D size)



Depth (3D position)



Color luminance



Color saturation



Curvature



Volume (3D size)



Same

Same

Most

Effectiveness

Least

➔ **Identity** Channels: **Categorical** Attributes

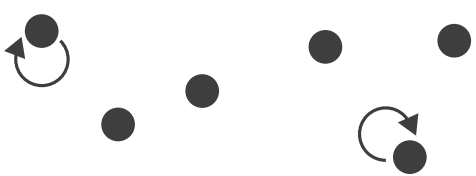
Spatial region



Color hue



Motion



Shape



*Arrange is
constrained by
data "shape"*

→ Tables

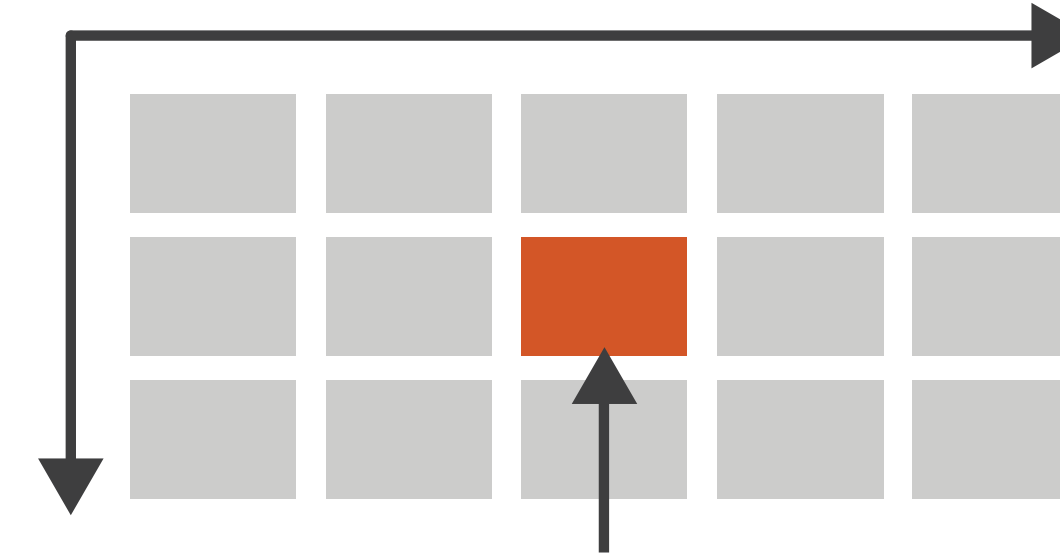
Keys

Values

Attributes

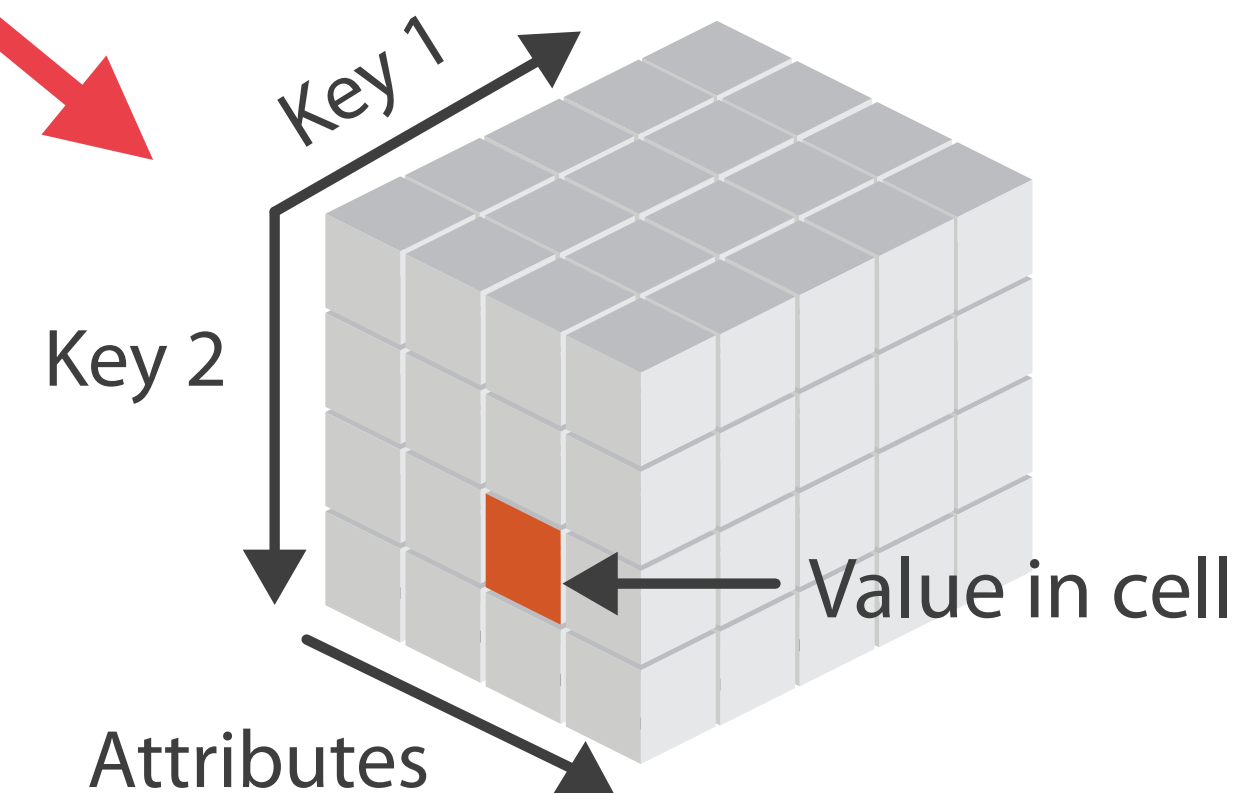
Items
(rows)

Attributes (columns)



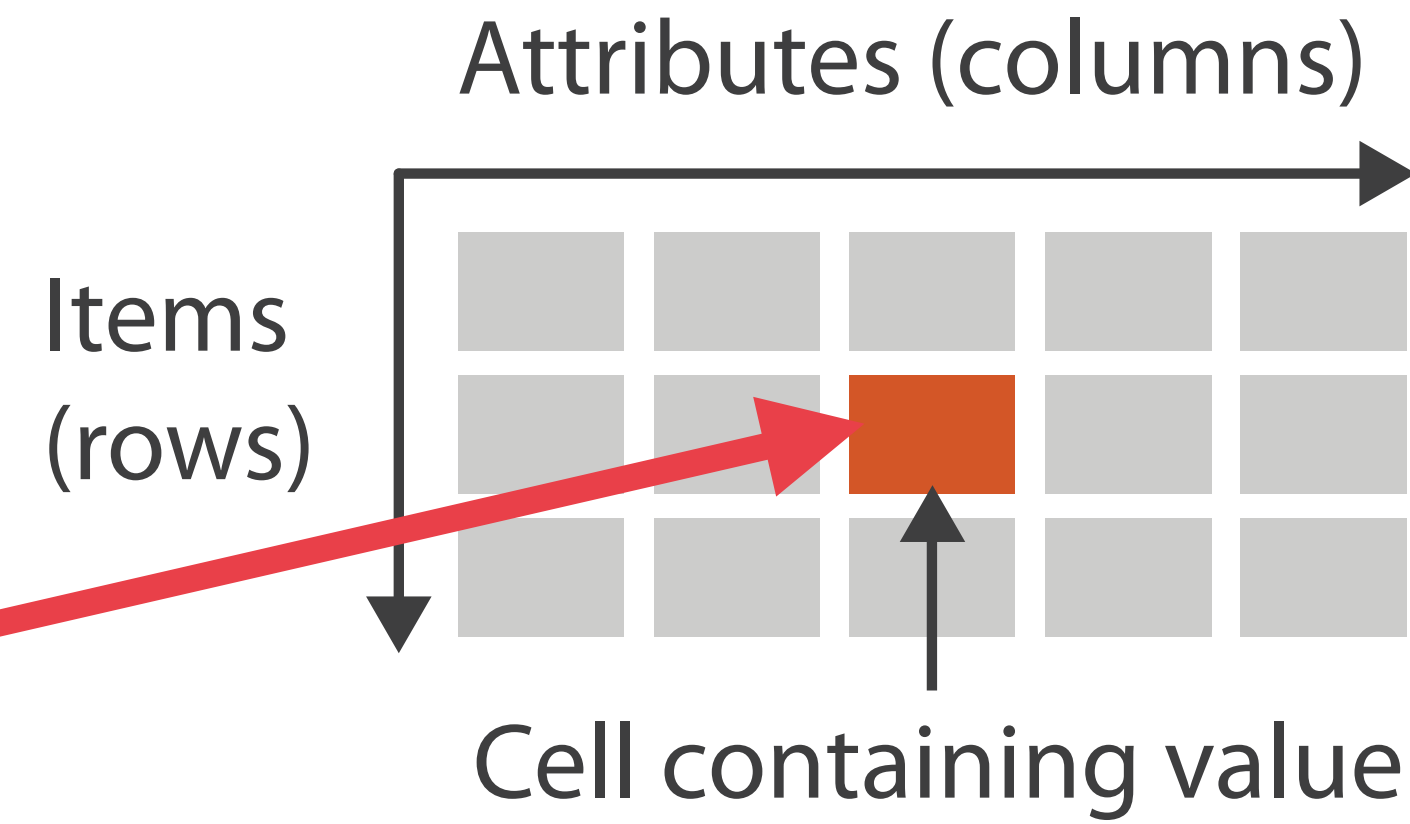
Cell containing value

→ *Multidimensional Table*



→ Tables

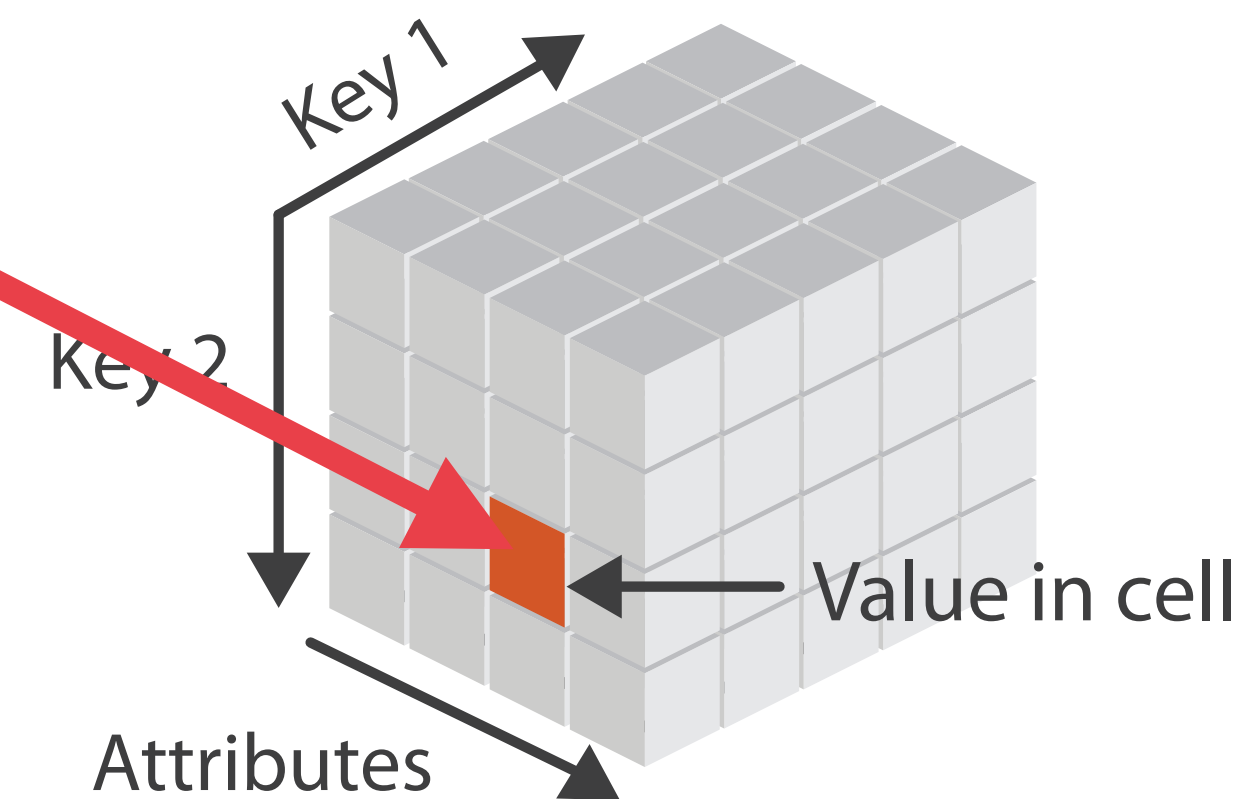
Keys



Values

→ *Multidimensional Table*

Attributes

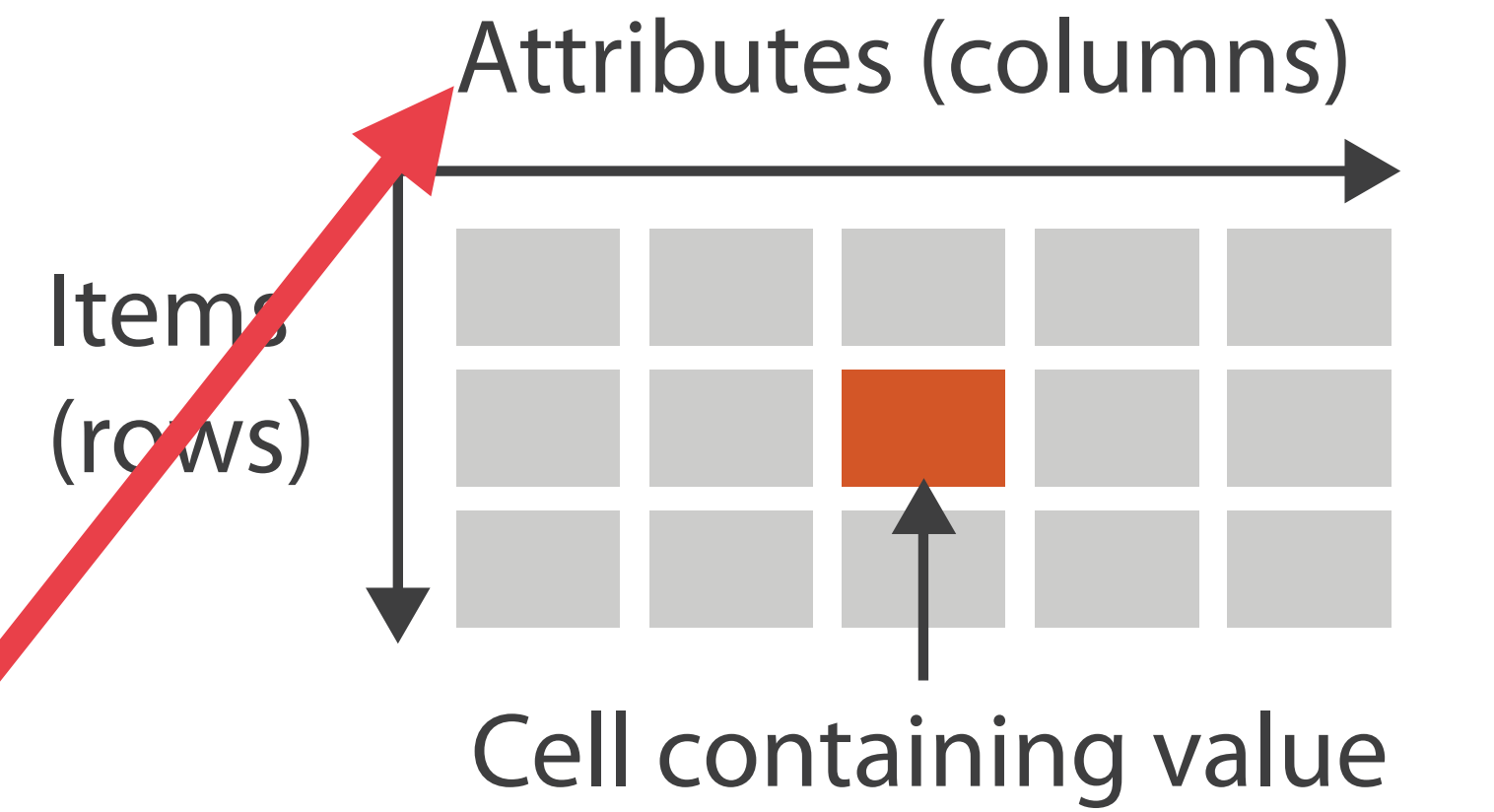


→ Tables

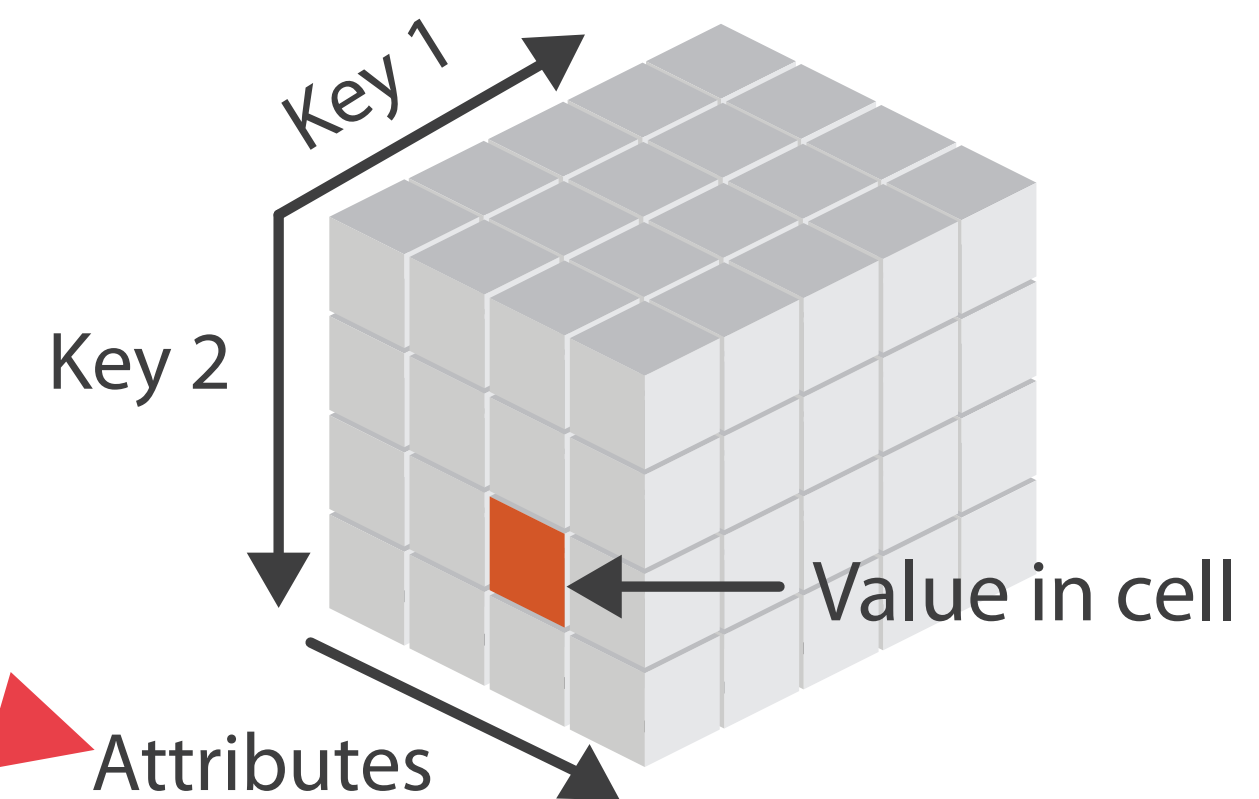
Keys

Values

Attributes



→ *Multidimensional Table*



Keys
index

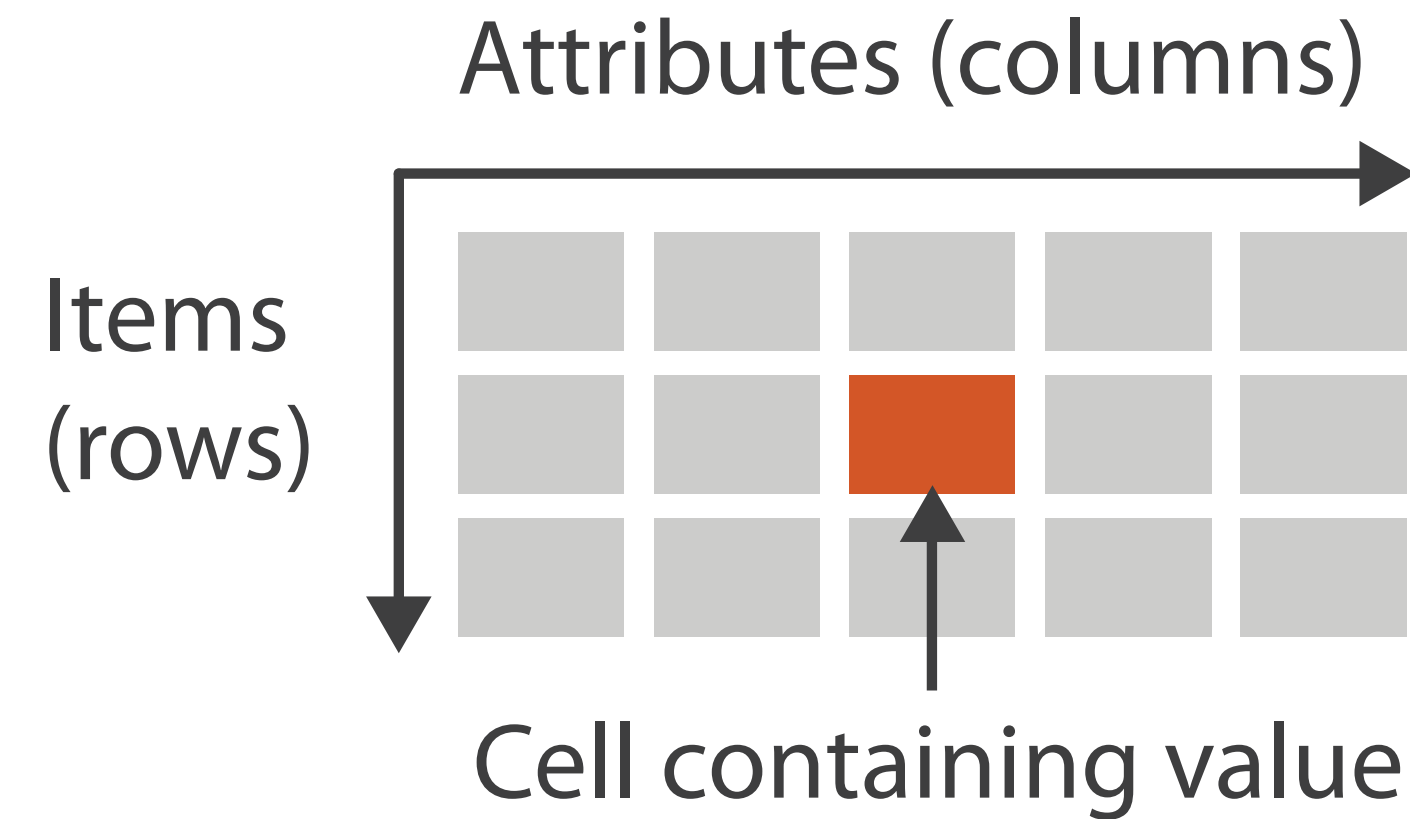
Values

"shape" of attribute

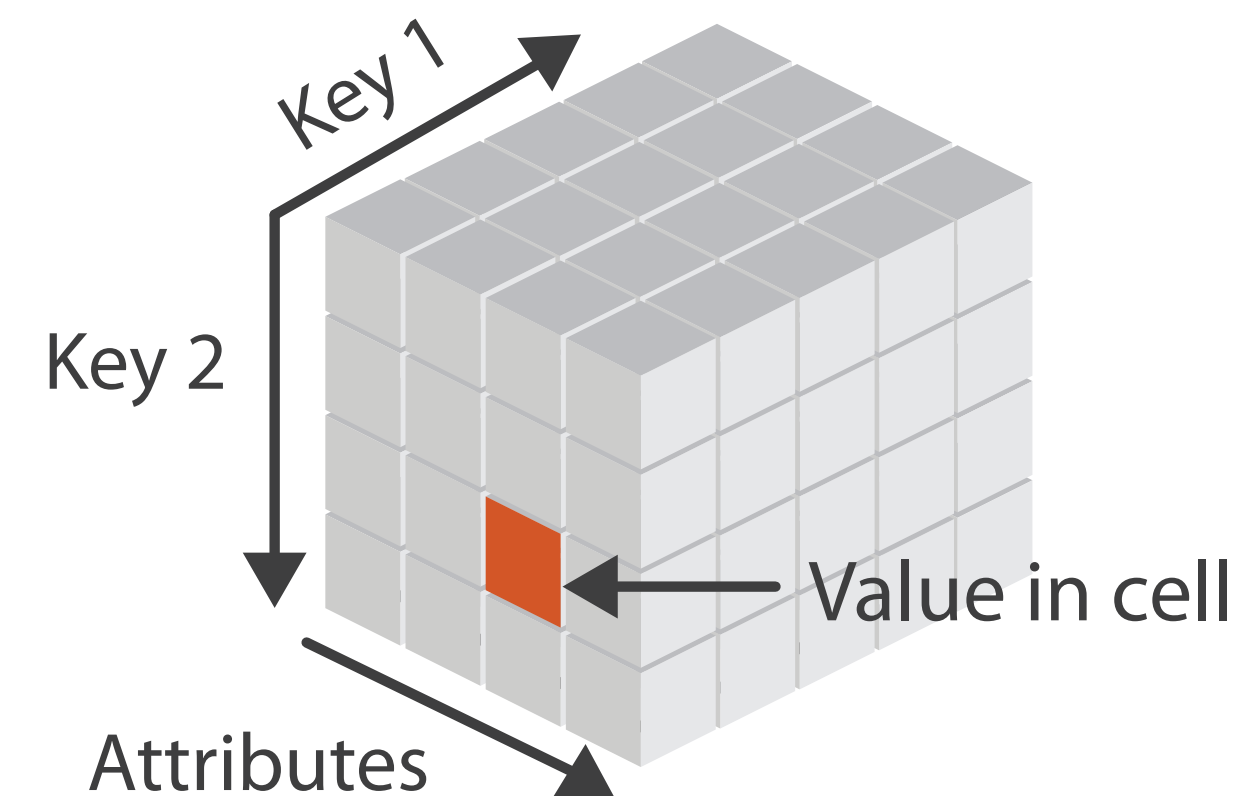
Attributes

type: categorical, ordinal, etc.

→ Tables



→ *Multidimensional Table*



→ Tables

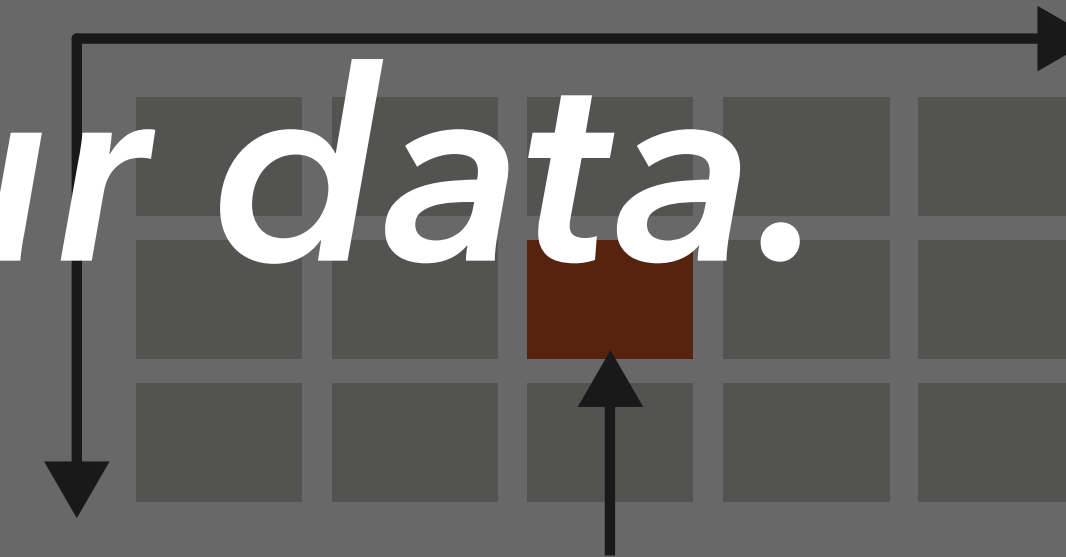
Keys

index

Identify the shape of your data.

*Items
(rows)*

Attributes (columns)



Cell containing value

Values

any type

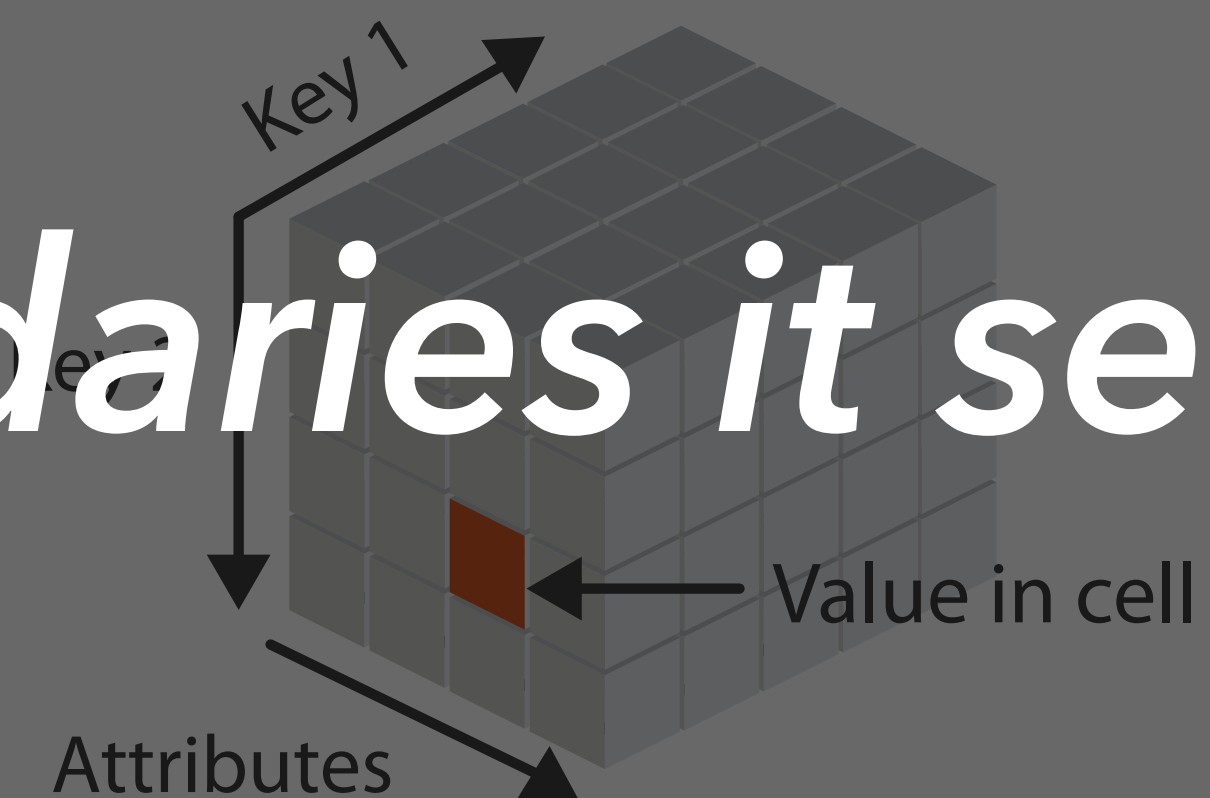
Change it to meet vis/algorithm needs.

→ *Multidimensional Table*

Design within the boundaries it sets.

Attributes

categorical or ordinal



Arrange Tables

→ Express Values

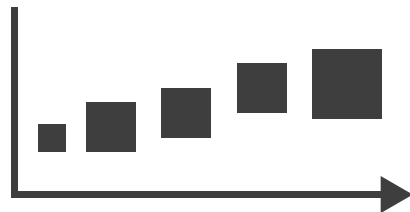


→ Separate, Order, Align Regions

→ Separate



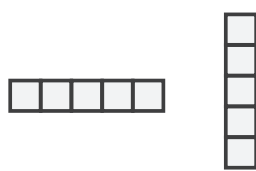
→ Order



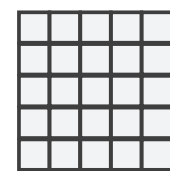
→ Align



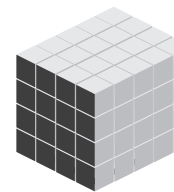
→ 1 Key
List



→ 2 Keys
Matrix



→ 3 Keys
Volume

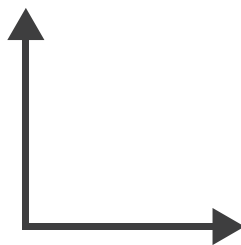


→ Many Keys
Recursive Subdivision

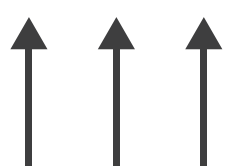


→ Axis Orientation

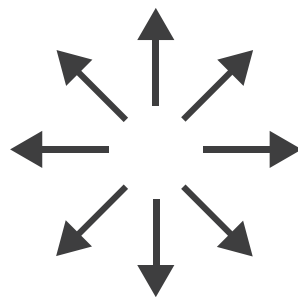
→ Rectilinear



→ Parallel

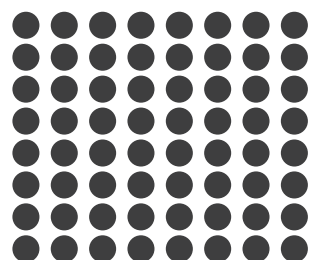


→ Radial



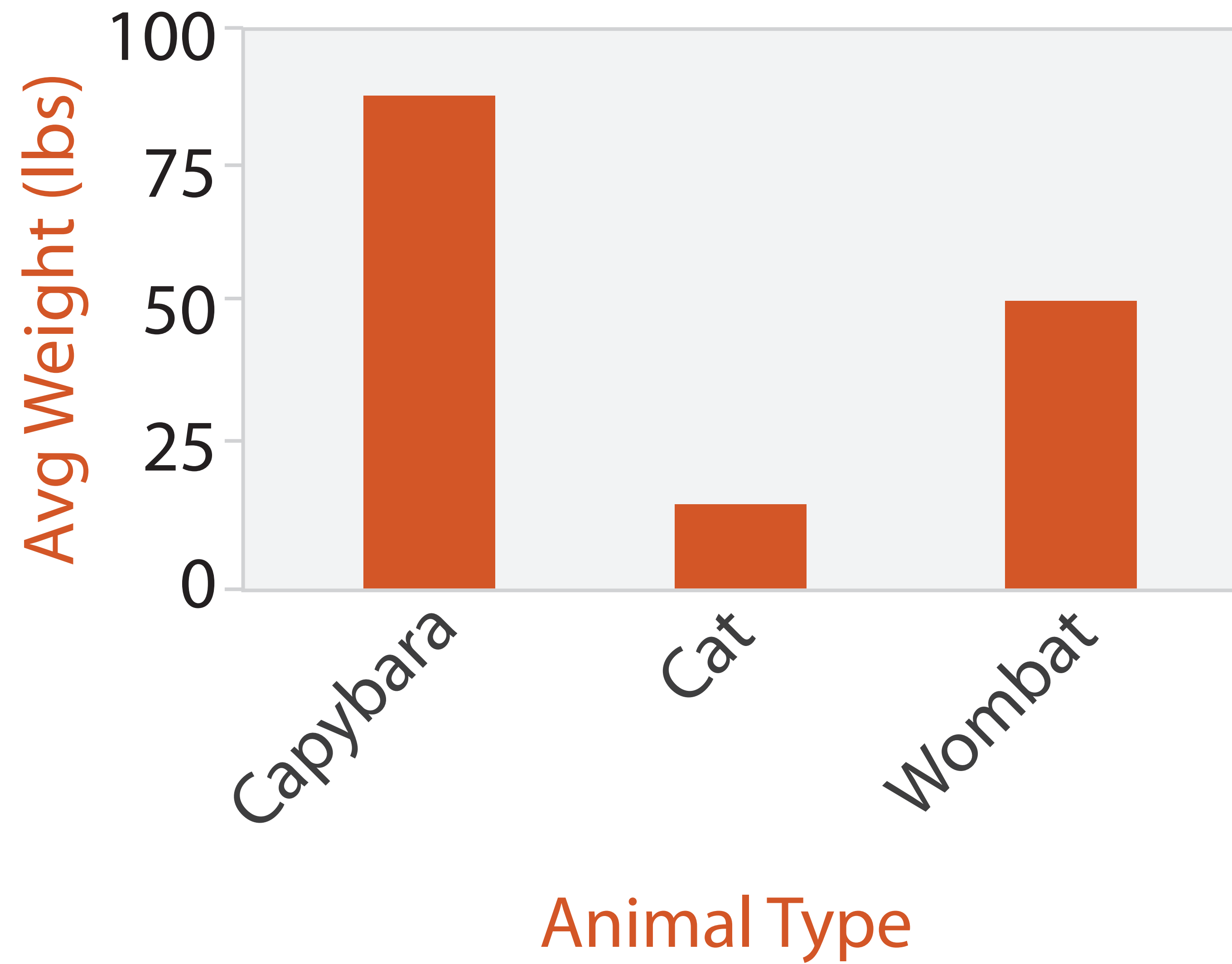
→ Layout Density

→ Dense



→ Space-Filling





Arrange Tables

→ Express Values



→ Separate, Order, Align Regions

→ Separate



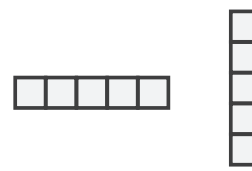
→ Order



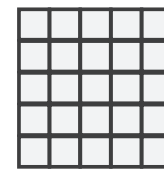
→ Align



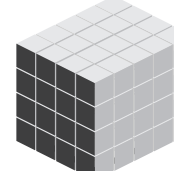
→ 1 Key
List



→ 2 Keys
Matrix



→ 3 Keys
Volume

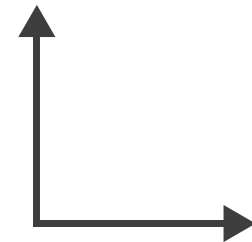


→ Many Keys
Recursive Subdivision

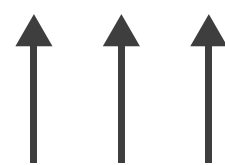


→ Axis Orientation

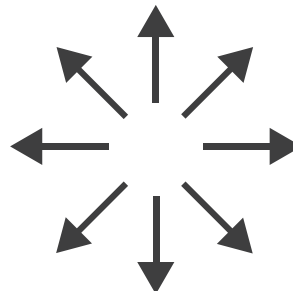
→ Rectilinear



→ Parallel

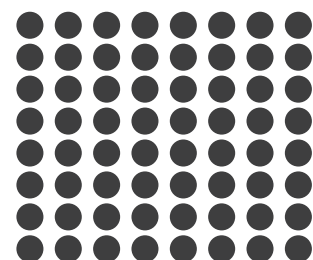


→ Radial



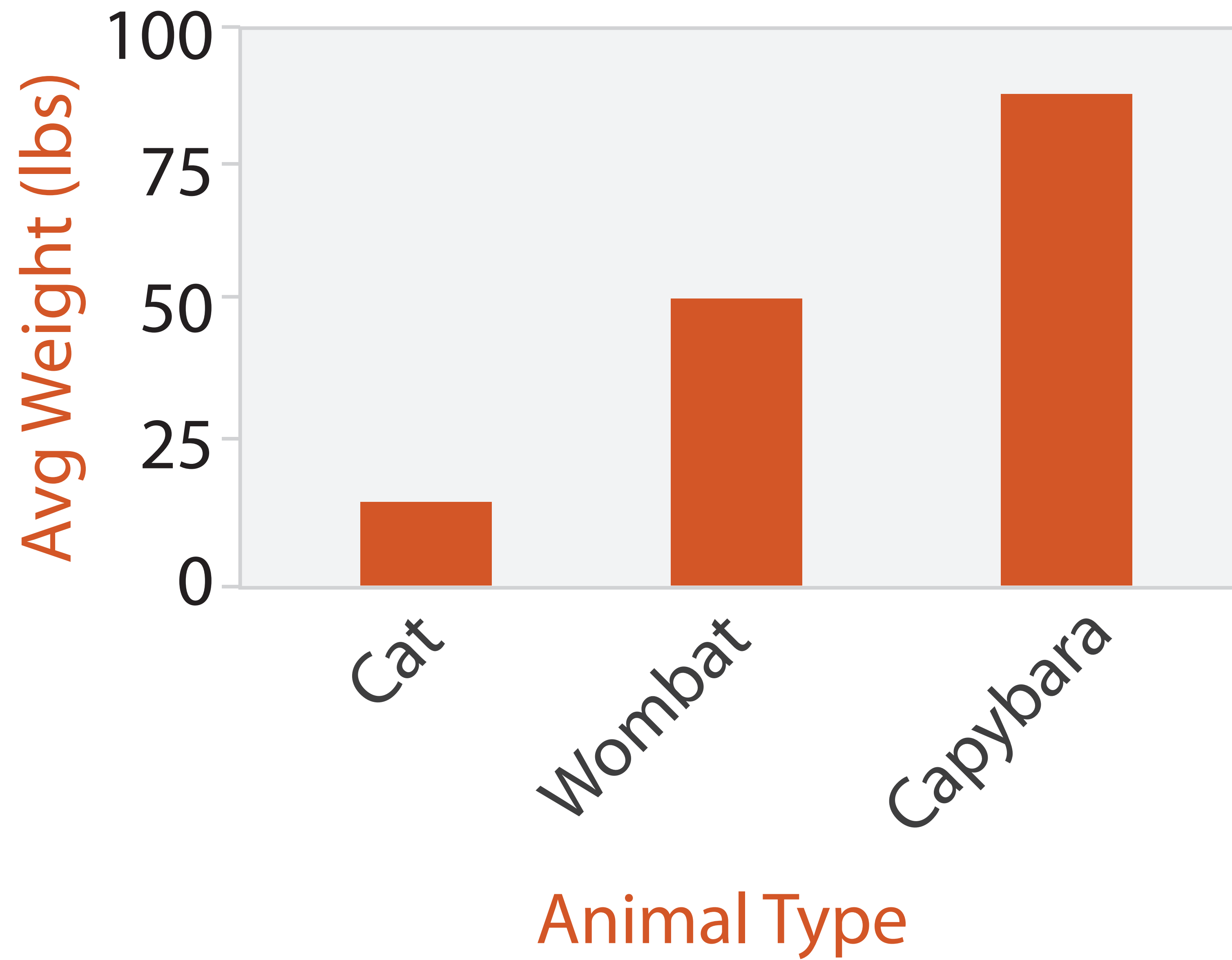
→ Layout Density

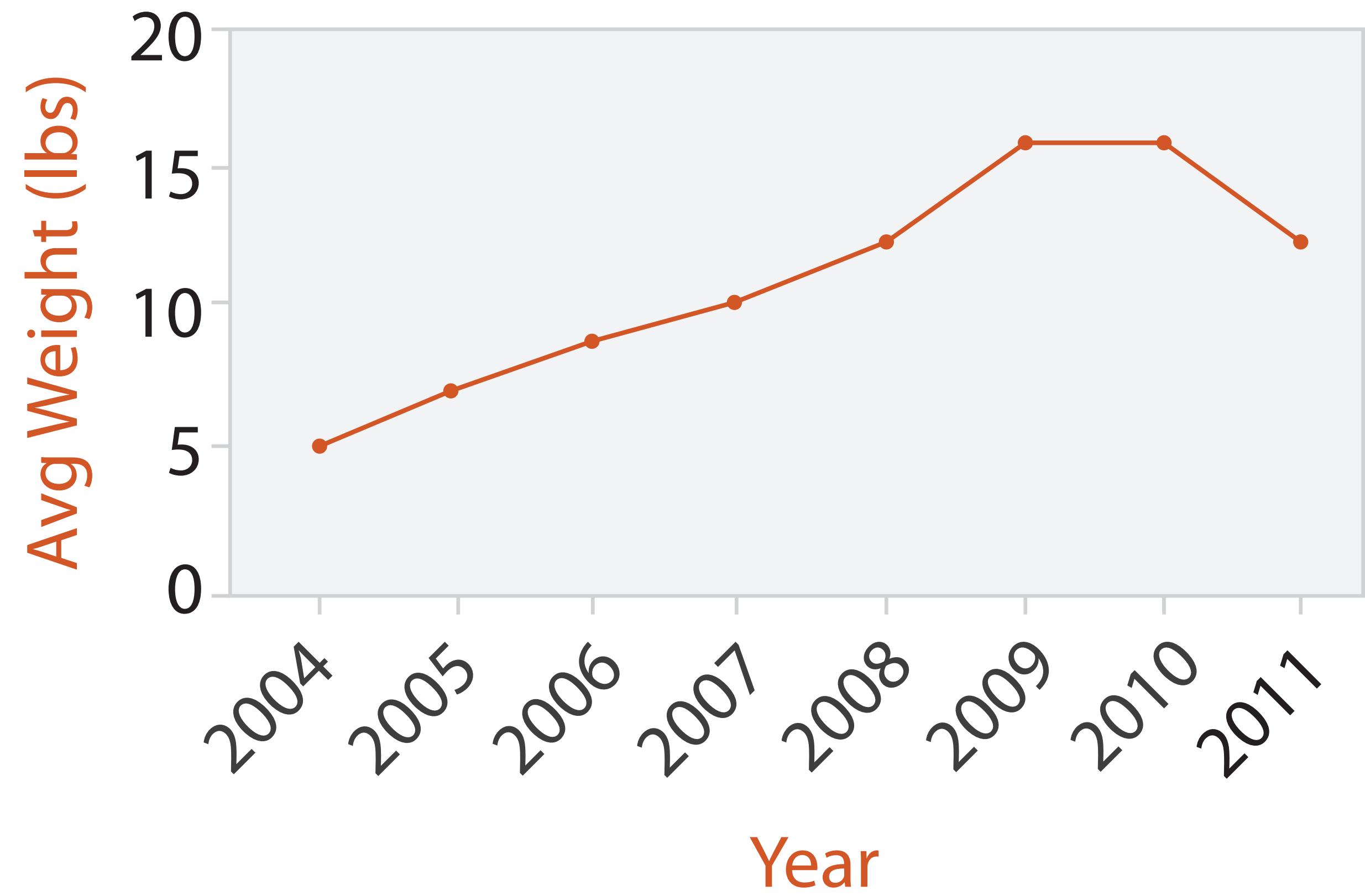
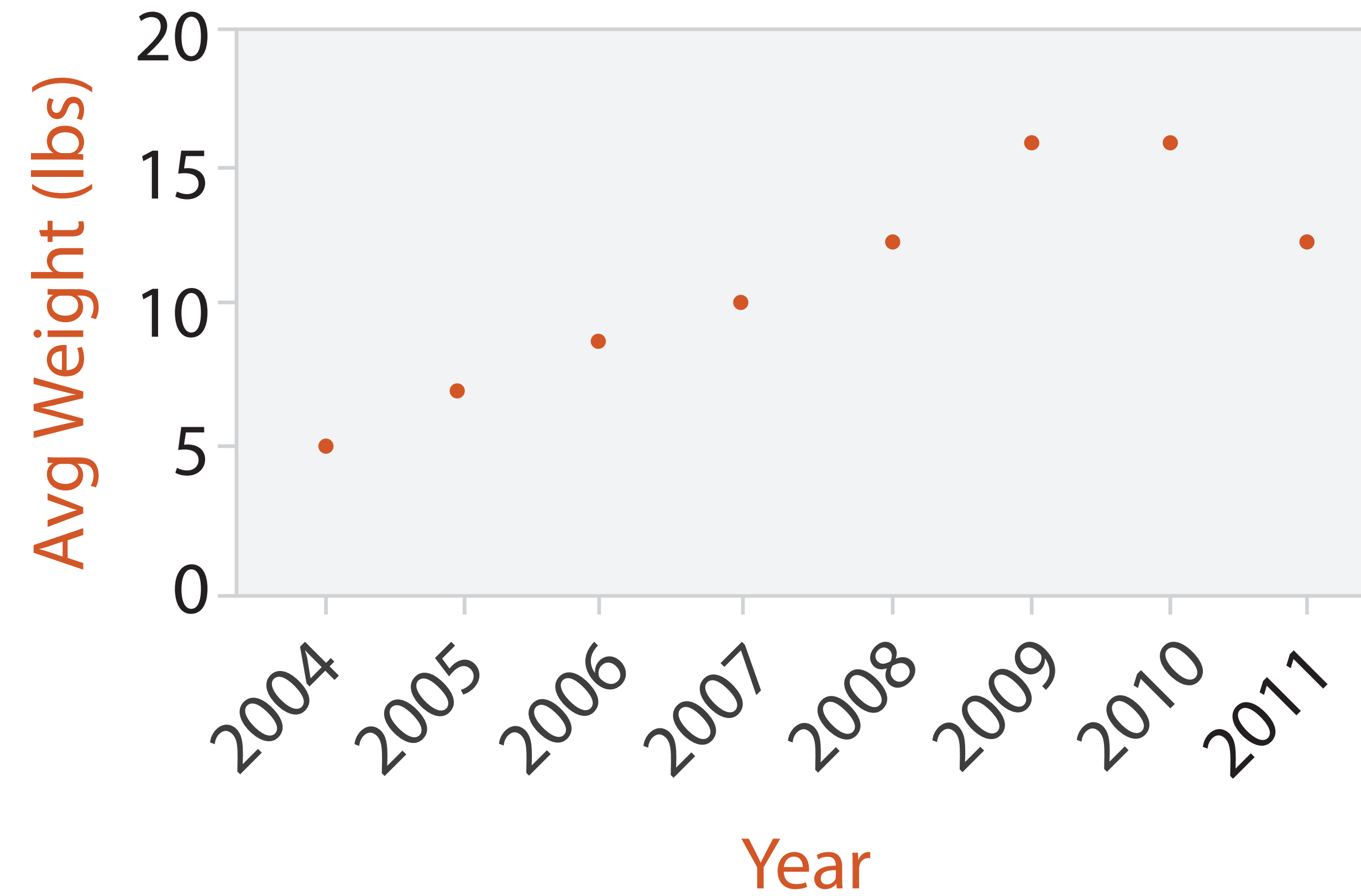
→ Dense

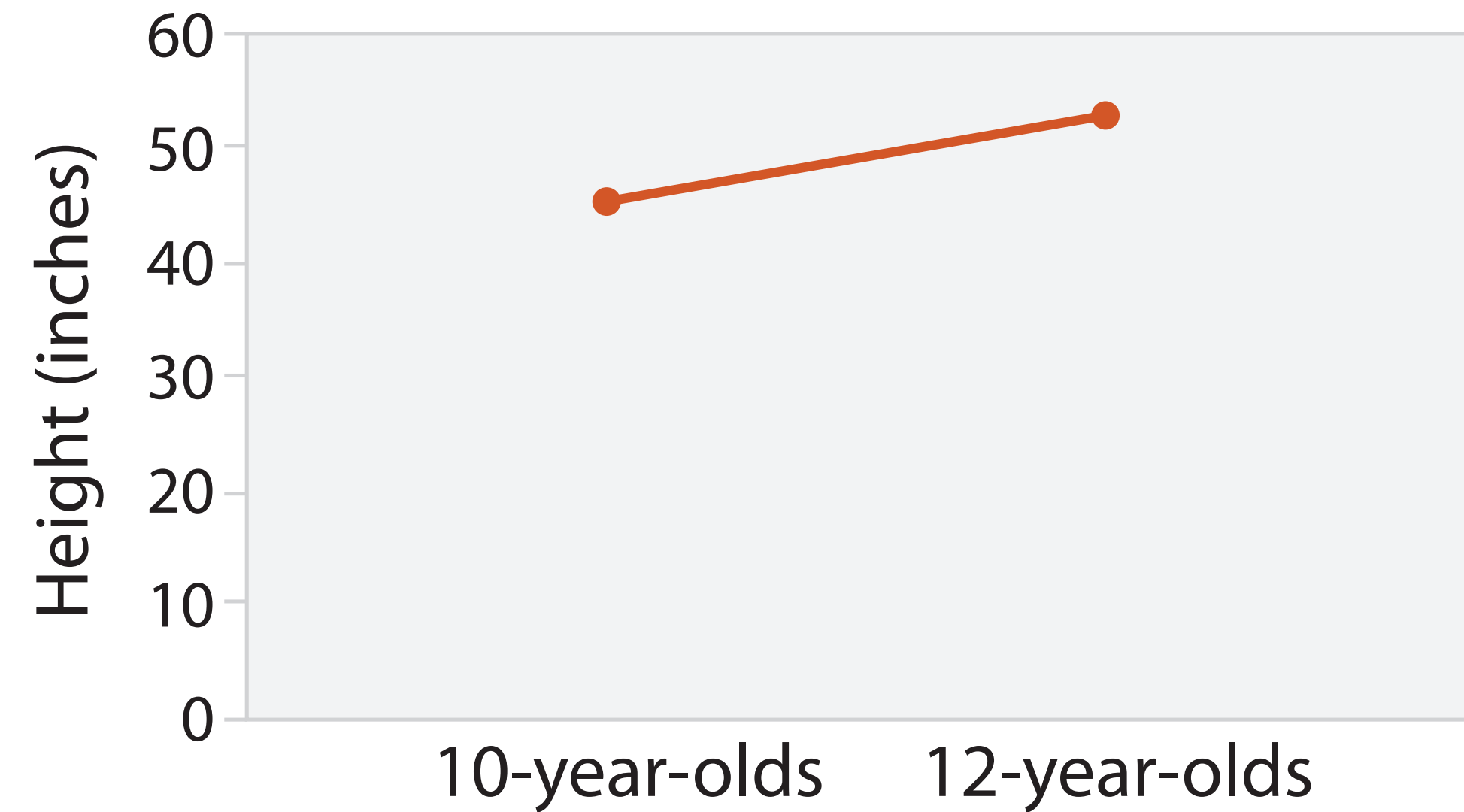
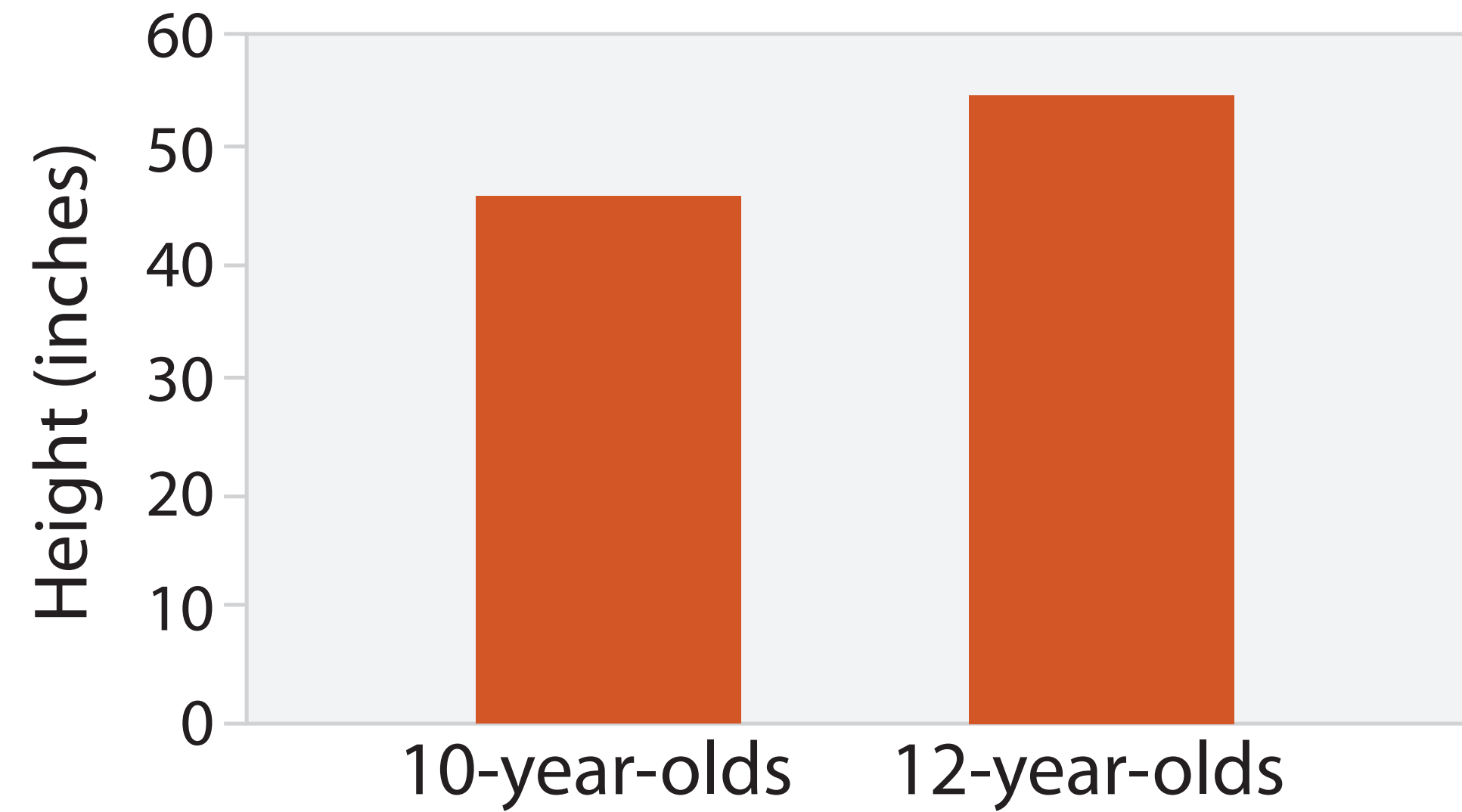


→ Space-Filling

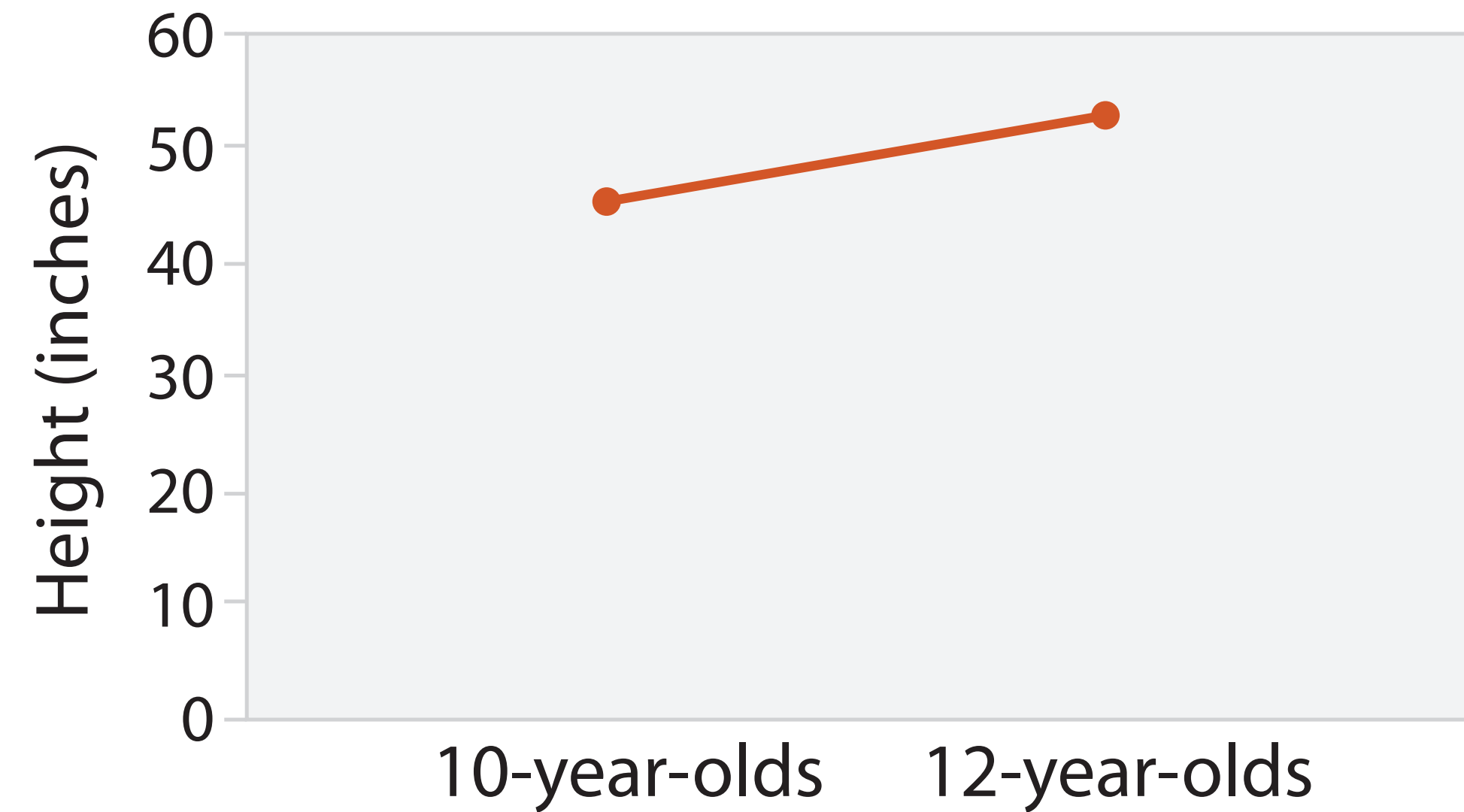
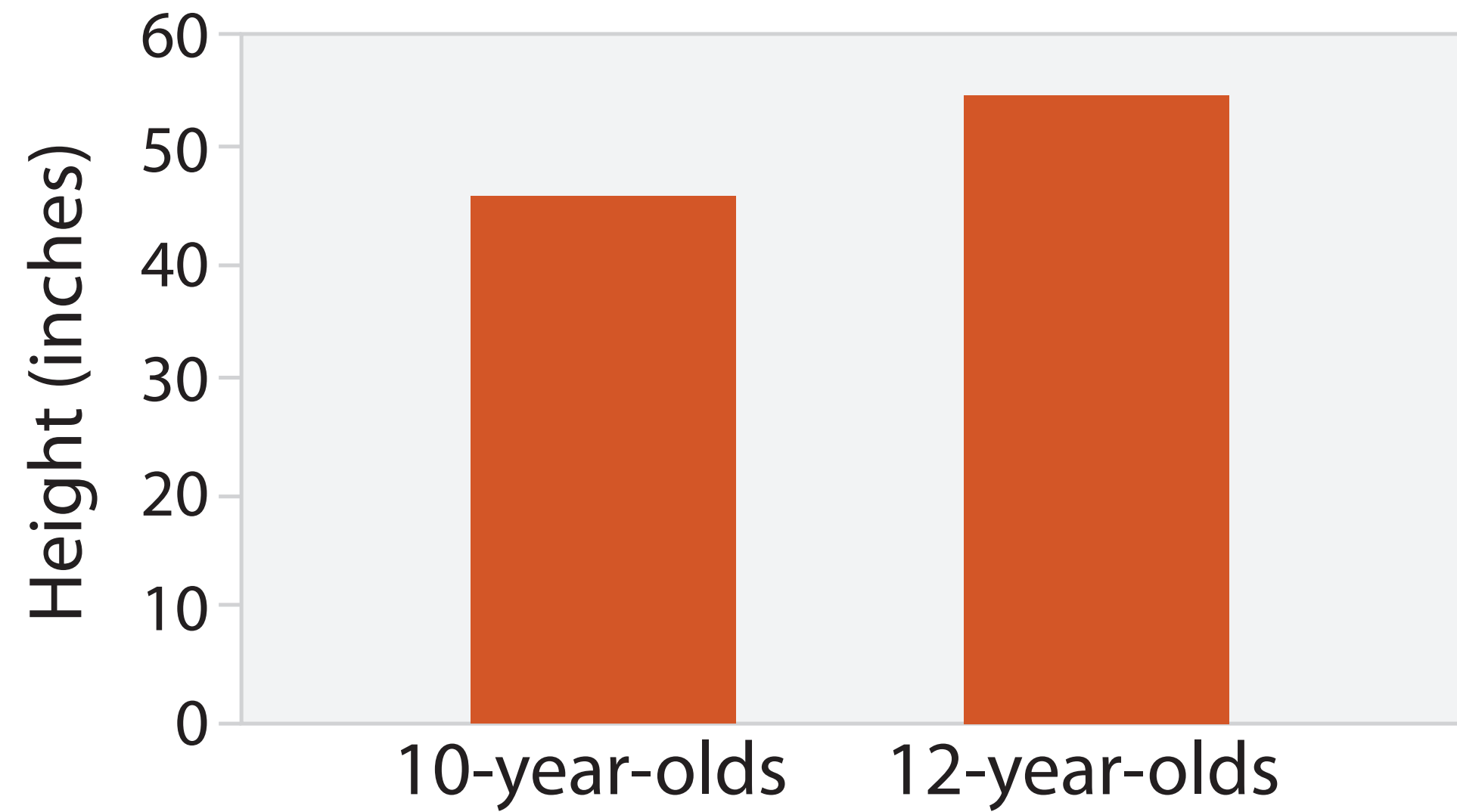




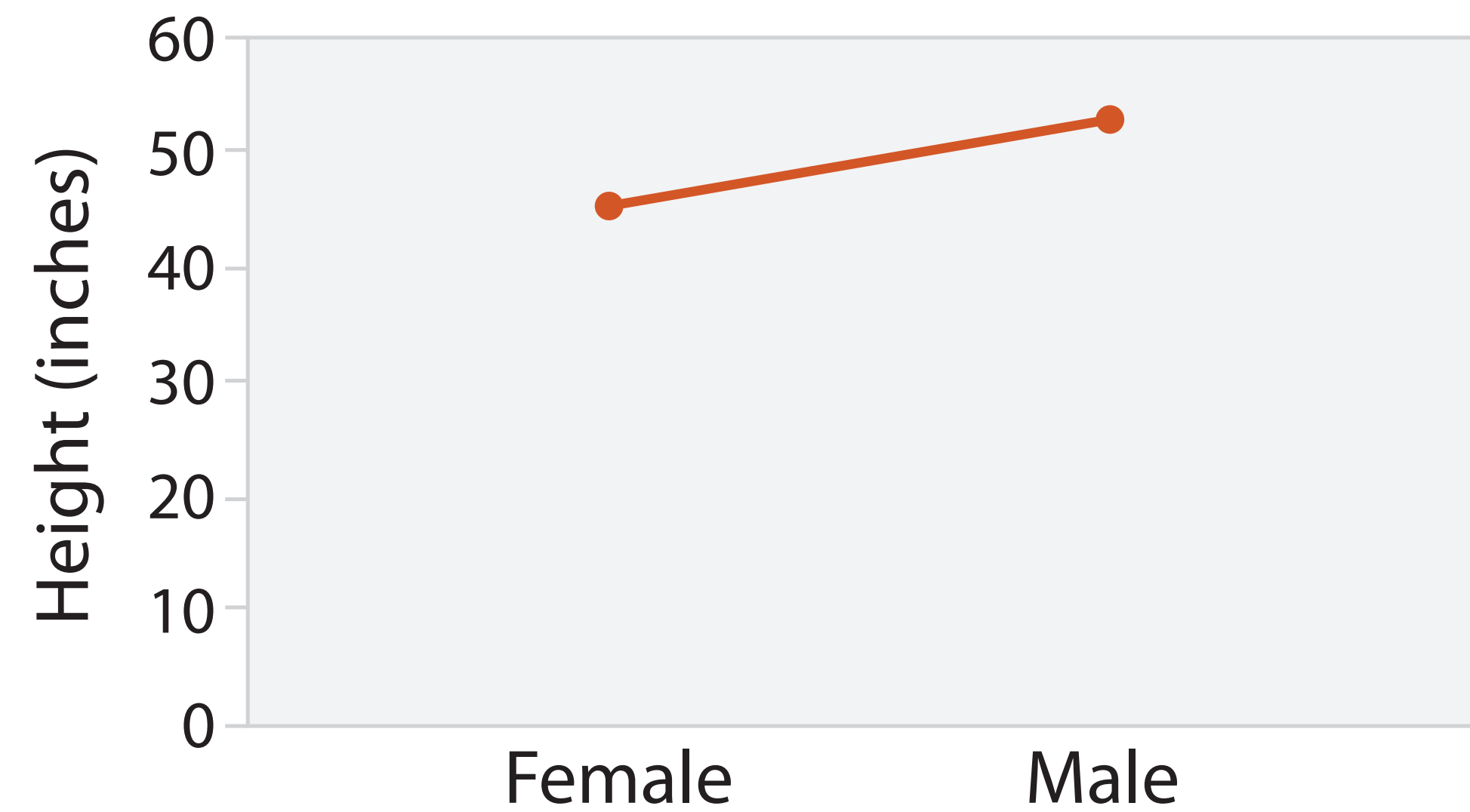
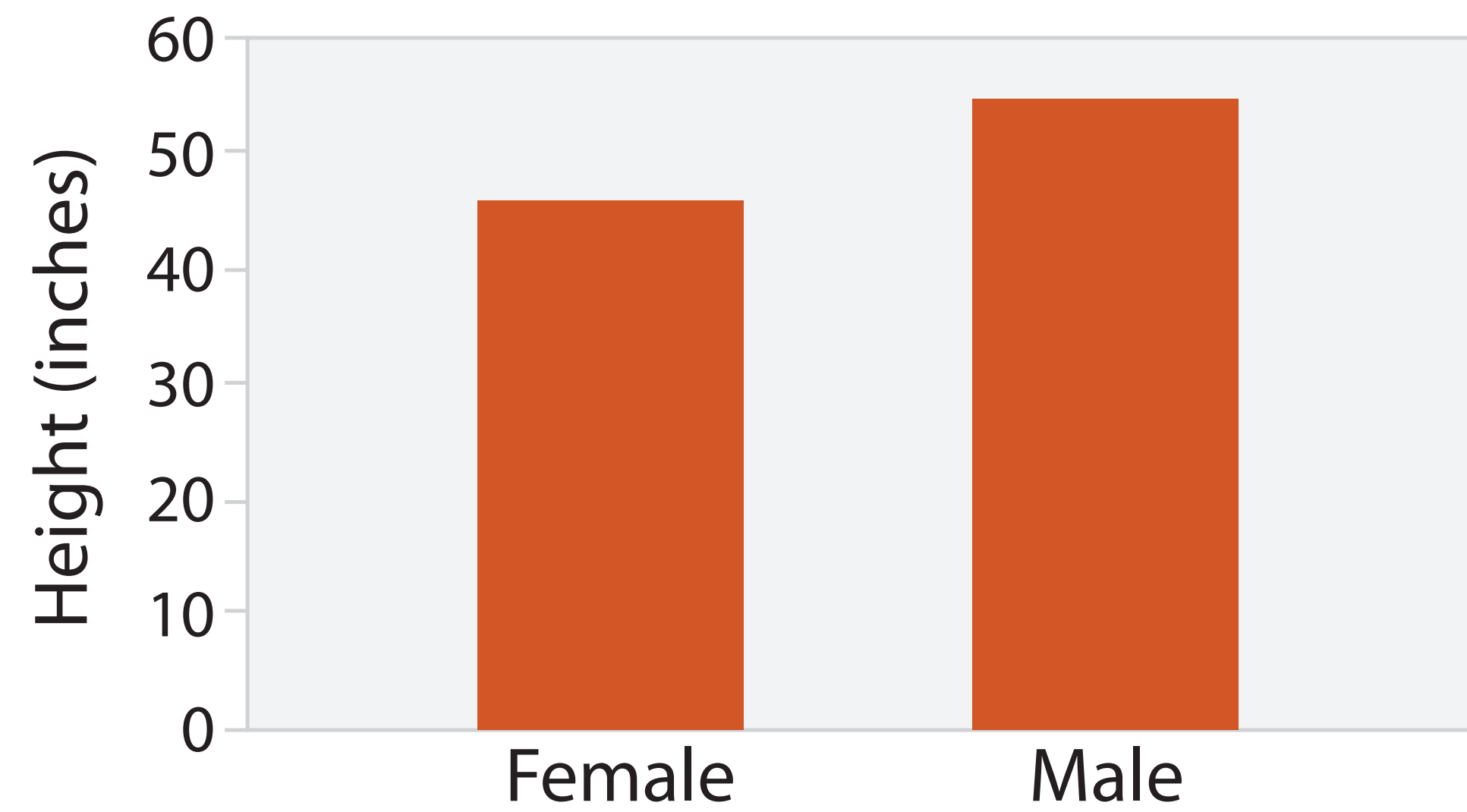




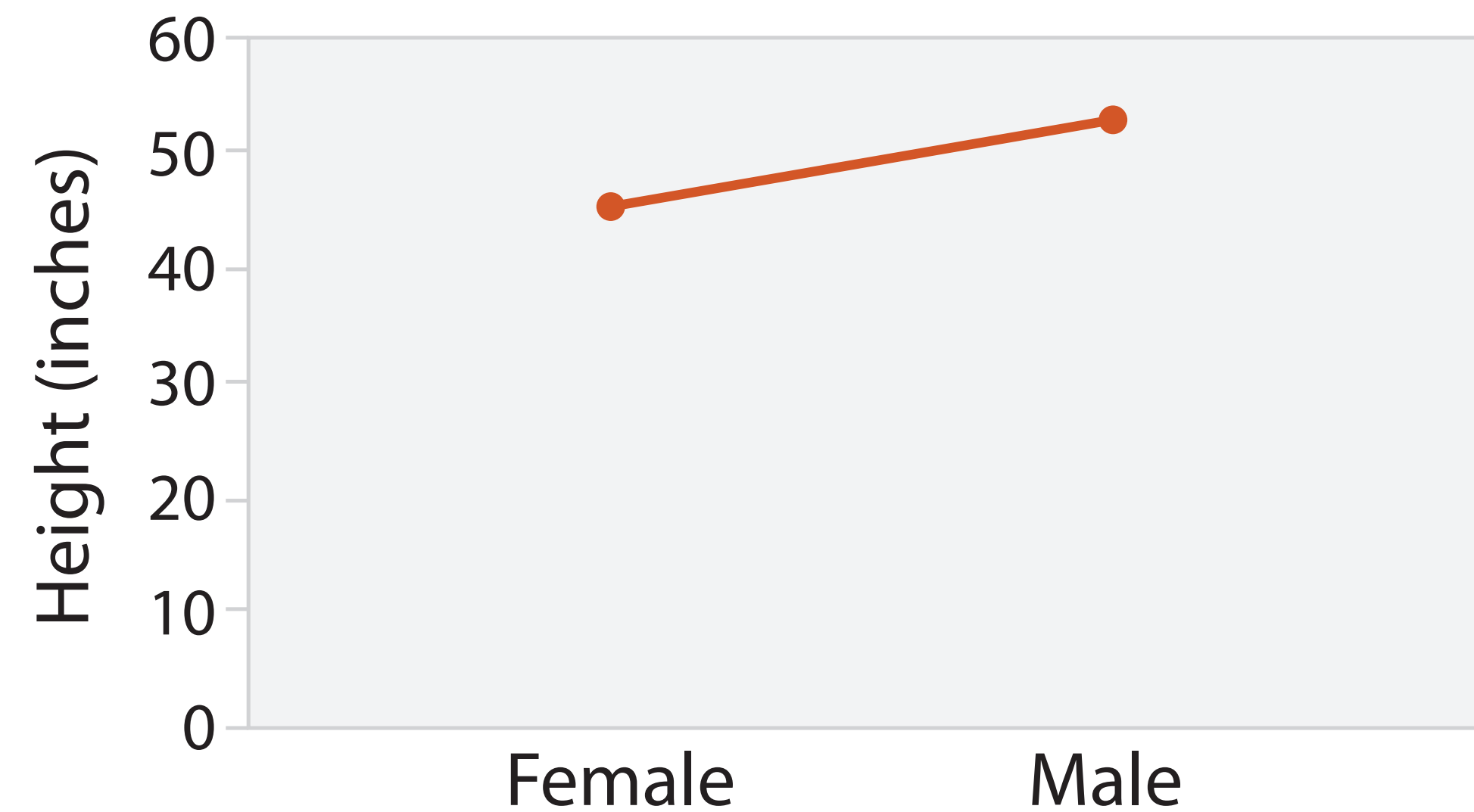
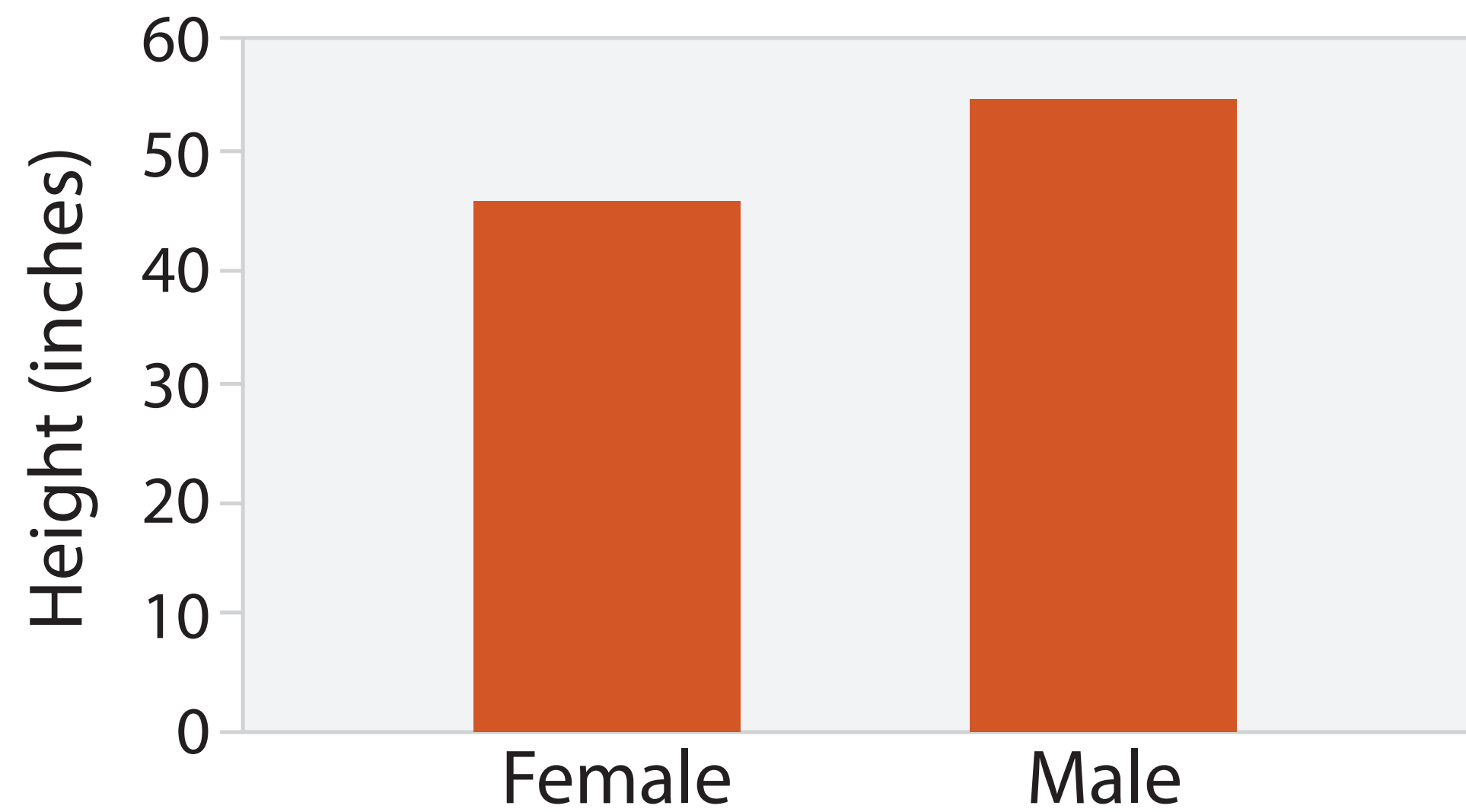
*How would you interpret
this chart?*



"The older you are, the taller you are on average"



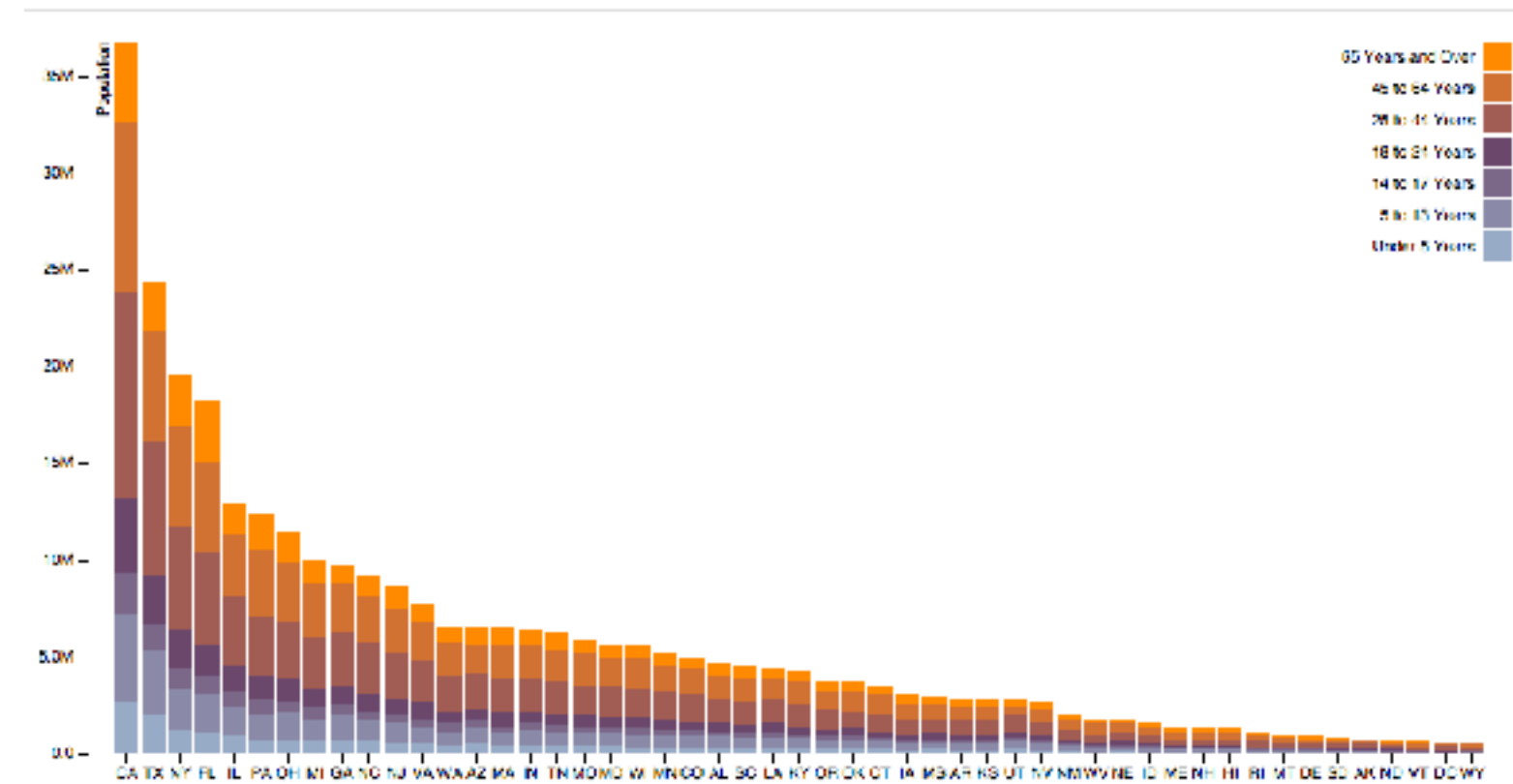
how about this one?



“The more male you become, the taller you are on average”

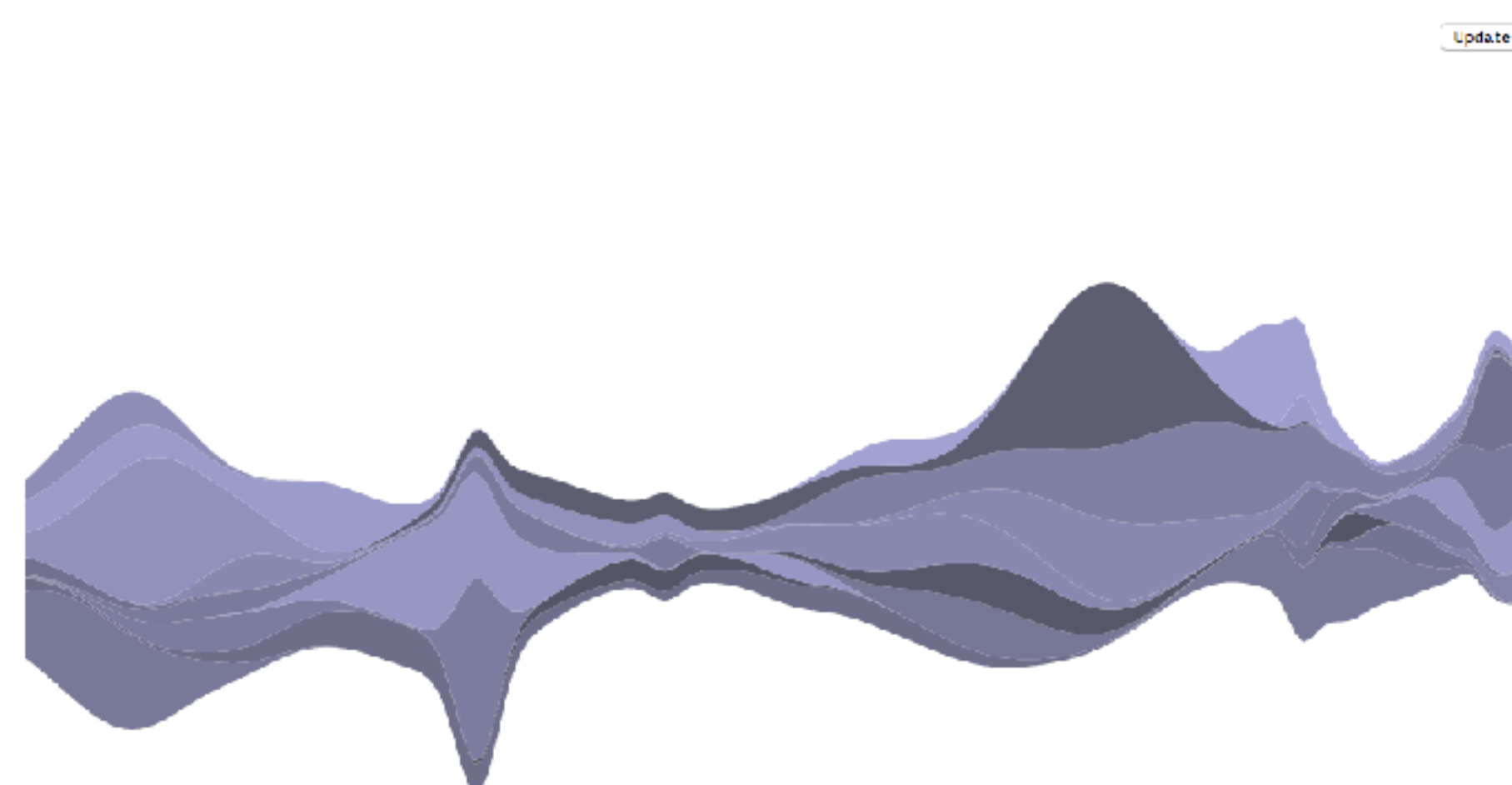
Stacked Bar:

<http://bl.ocks.org/mbostock/3886208>



StreamGraph:

<http://bl.ocks.org/mbostock/4060954>



Mini lab

*On a sheet of paper, draw as many
unique encodings of the following
dataset:*

*On a sheet of paper, draw as many
unique encodings of the following
dataset:*

77

35

Blog Home

45 Ways to Communicate Two Quantities



Santiago Ortiz

published on July 27, 2012 in **Design**

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Back in 2010, I was giving a workshop on interactive data visualization in Lima, Perú, discussing whether a dataset has a unique or at least an ideal way to be visualized.

For a simple data structure — a list of some hundreds of numbers, for instance — around half of 20 participants were convinced that there's one way that is clearly better in communicating the data, regardless of the unit of the values, their range, meaning, context and possible aim of the visualization.

Arrange Tables

→ Express Values

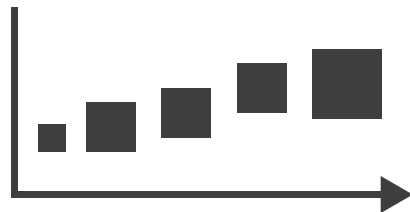


→ Separate, Order, Align Regions

→ Separate



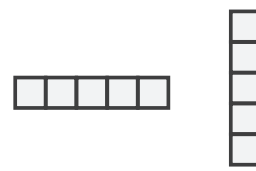
→ Order



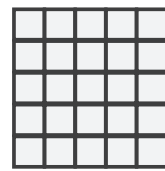
→ Align



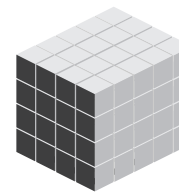
→ 1 Key
List



→ 2 Keys
Matrix



→ 3 Keys
Volume

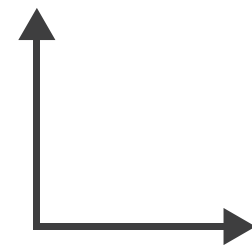


→ Many Keys
Recursive Subdivision

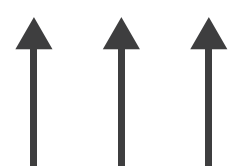


→ Axis Orientation

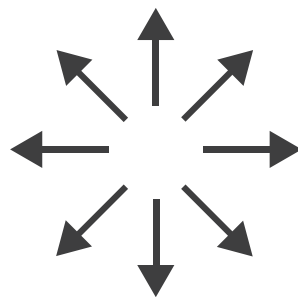
→ Rectilinear



→ Parallel

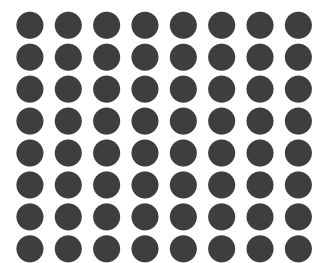


→ Radial



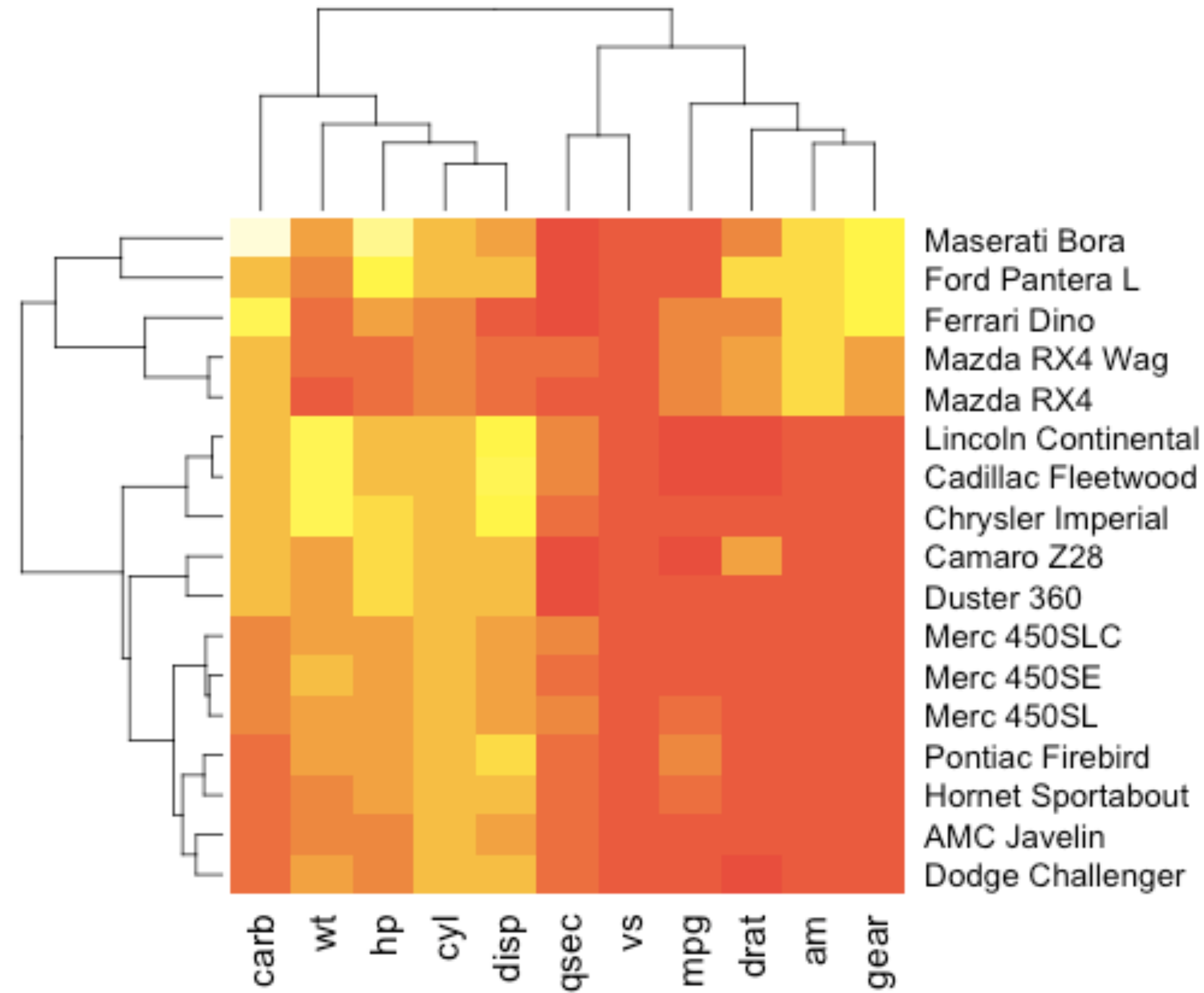
→ Layout Density

→ Dense

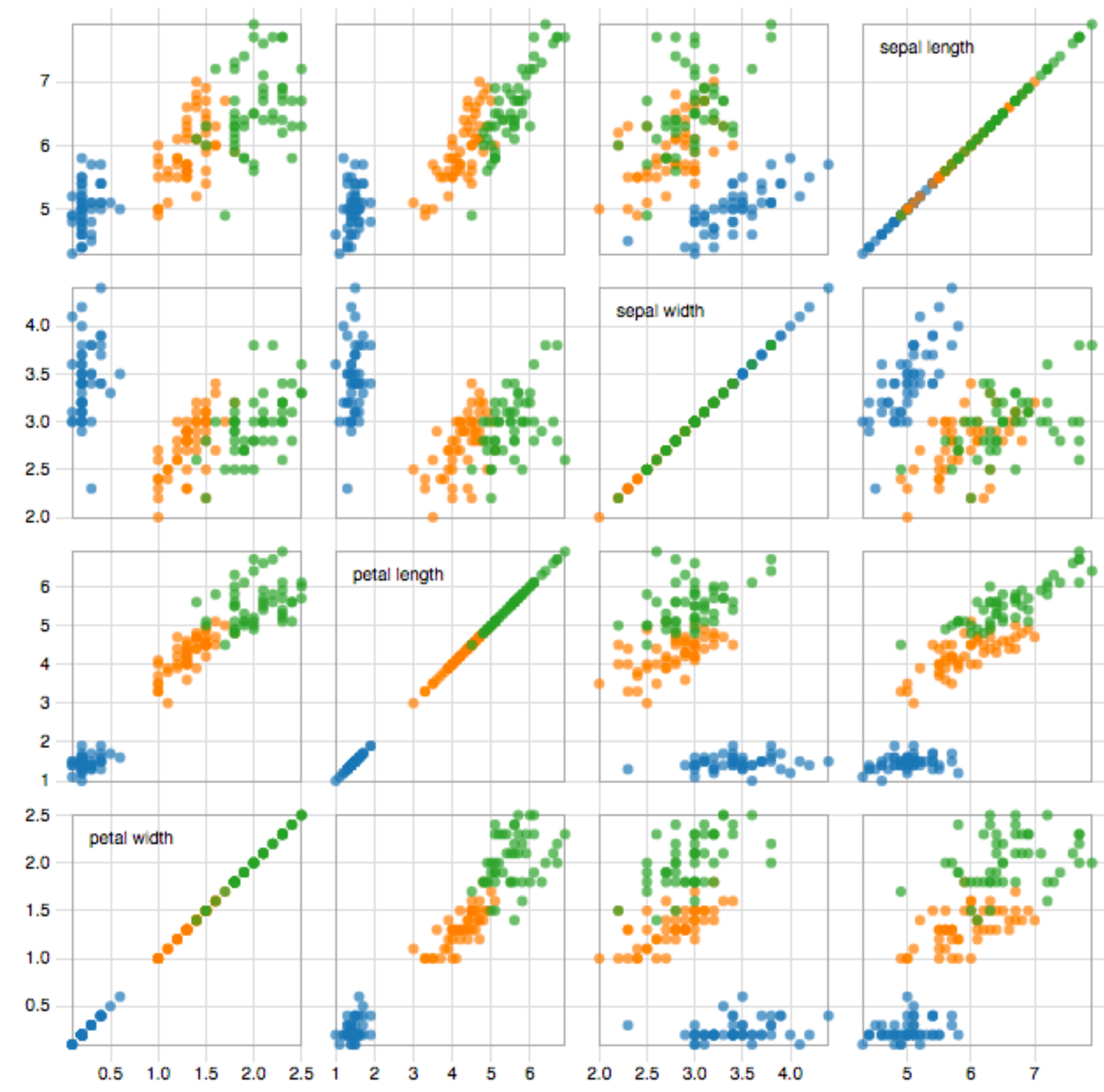


→ Space-Filling





Clustered Heatmap



SPLOM

Arrange Tables

→ Express Values

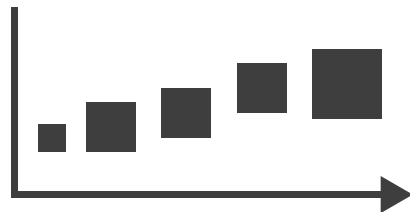


→ Separate, Order, Align Regions

→ Separate



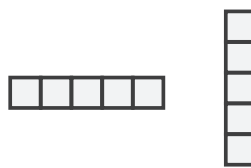
→ Order



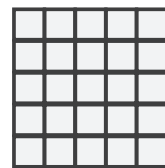
→ Align



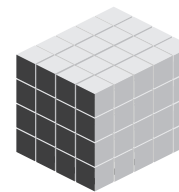
→ 1 Key
List



→ 2 Keys
Matrix



→ 3 Keys
Volume

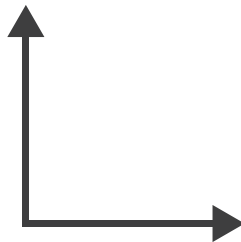


→ Many Keys
Recursive Subdivision

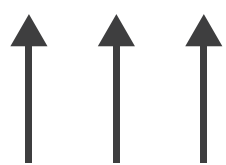


→ Axis Orientation

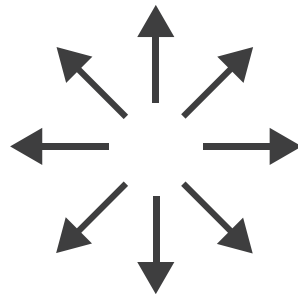
→ Rectilinear



→ Parallel

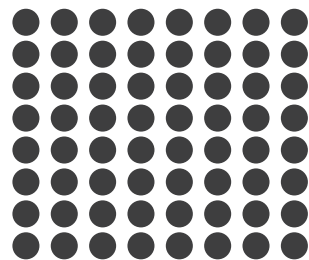


→ Radial



→ Layout Density

→ Dense



→ Space-Filling



don't use 3d.

(no unjustified

3d)

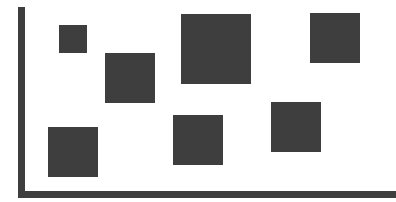
Arrange Tables

→ Express Values



→ Separate, Order, Align Regions

→ Separate



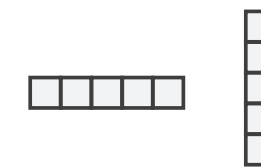
→ Order



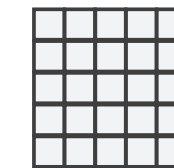
→ Align



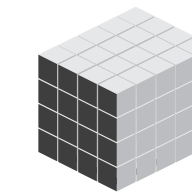
→ 1 Key
List



→ 2 Keys
Matrix



→ 3 Keys
Volume

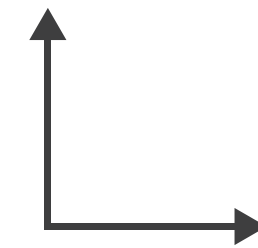


→ Many Keys
Recursive Subdivision

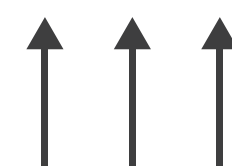


→ Axis Orientation

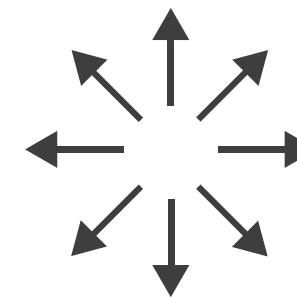
→ Rectilinear



→ Parallel

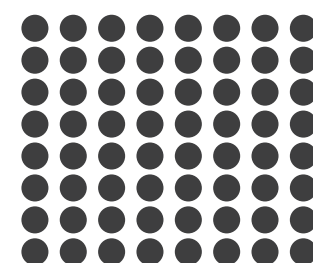


→ Radial

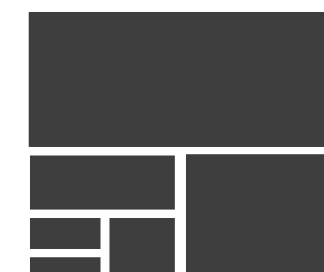


→ Layout Density

→ Dense



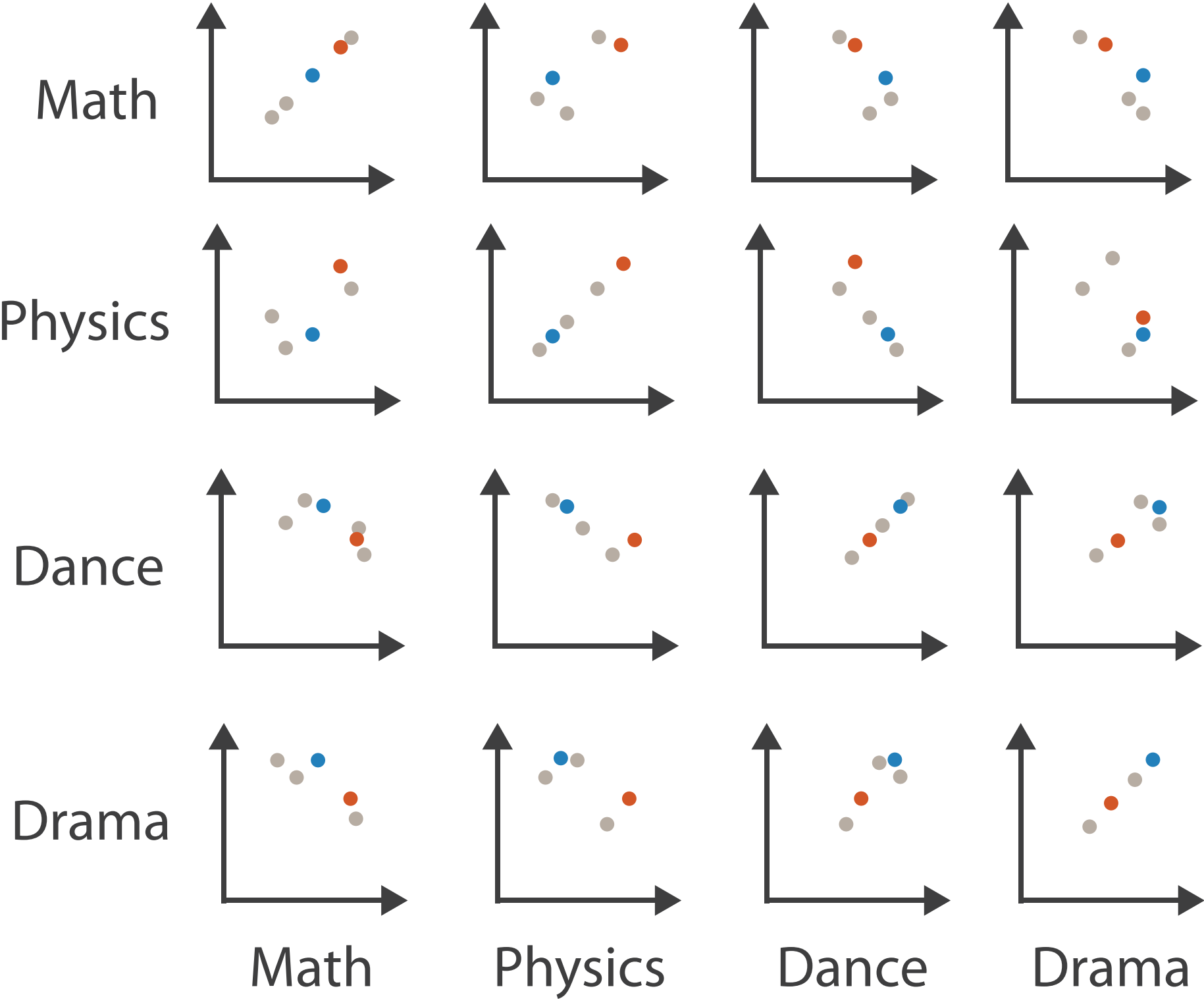
→ Space-Filling



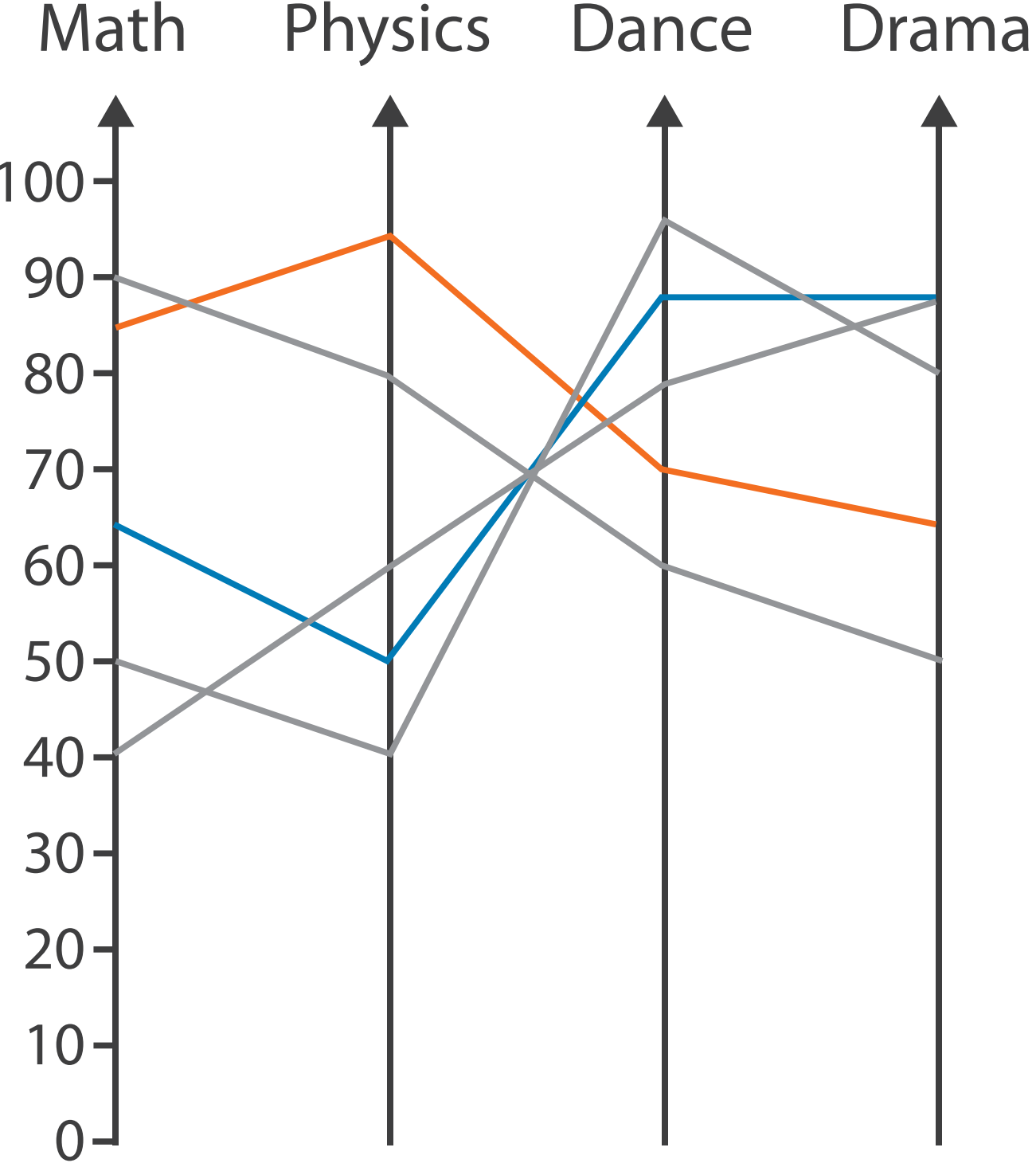
Table

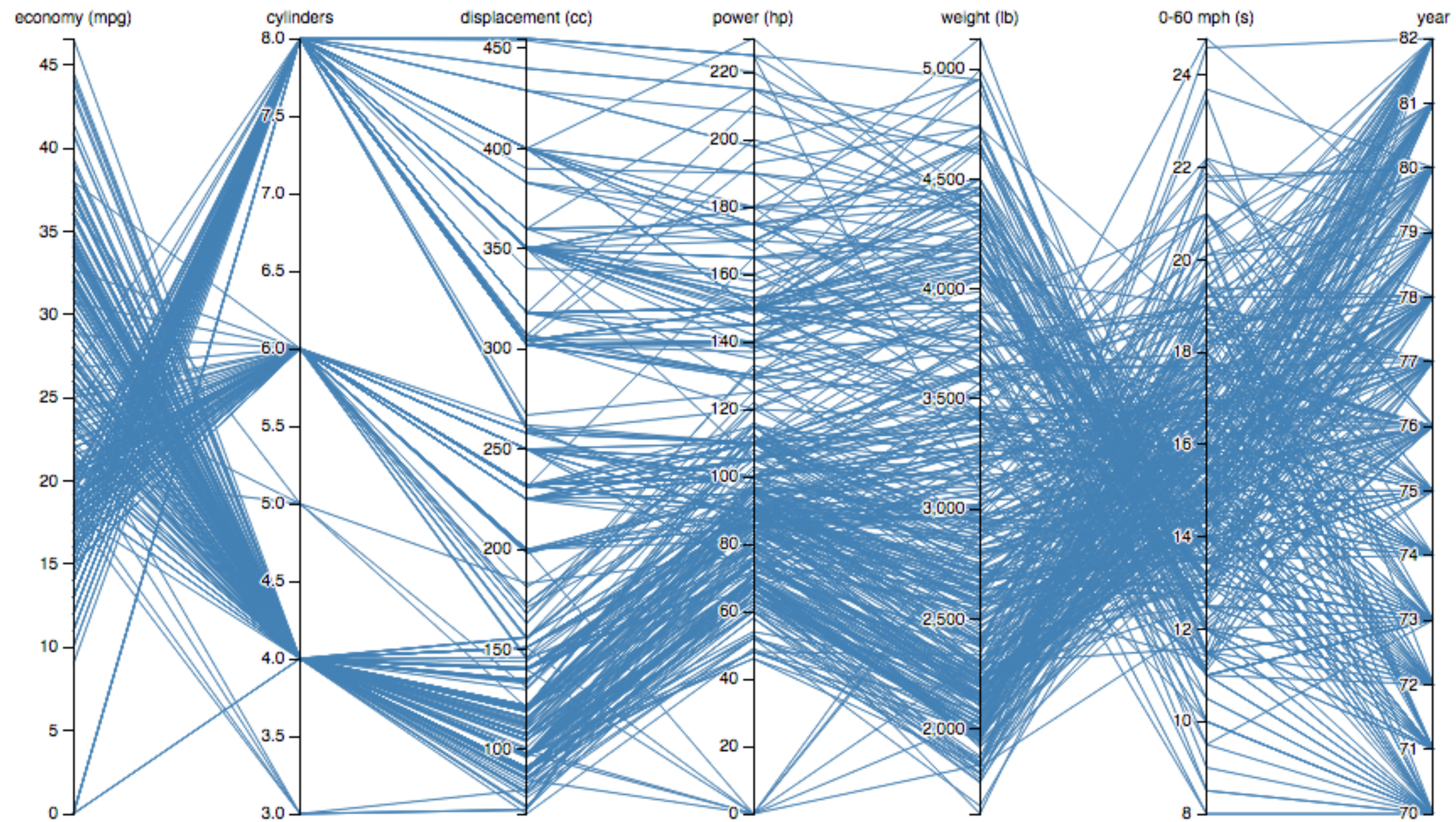
Math	Physics	Dance	Drama
85	95	70	65
90	80	60	50
65	50	90	90
50	40	95	80
40	60	80	90

Scatterplot Matrix

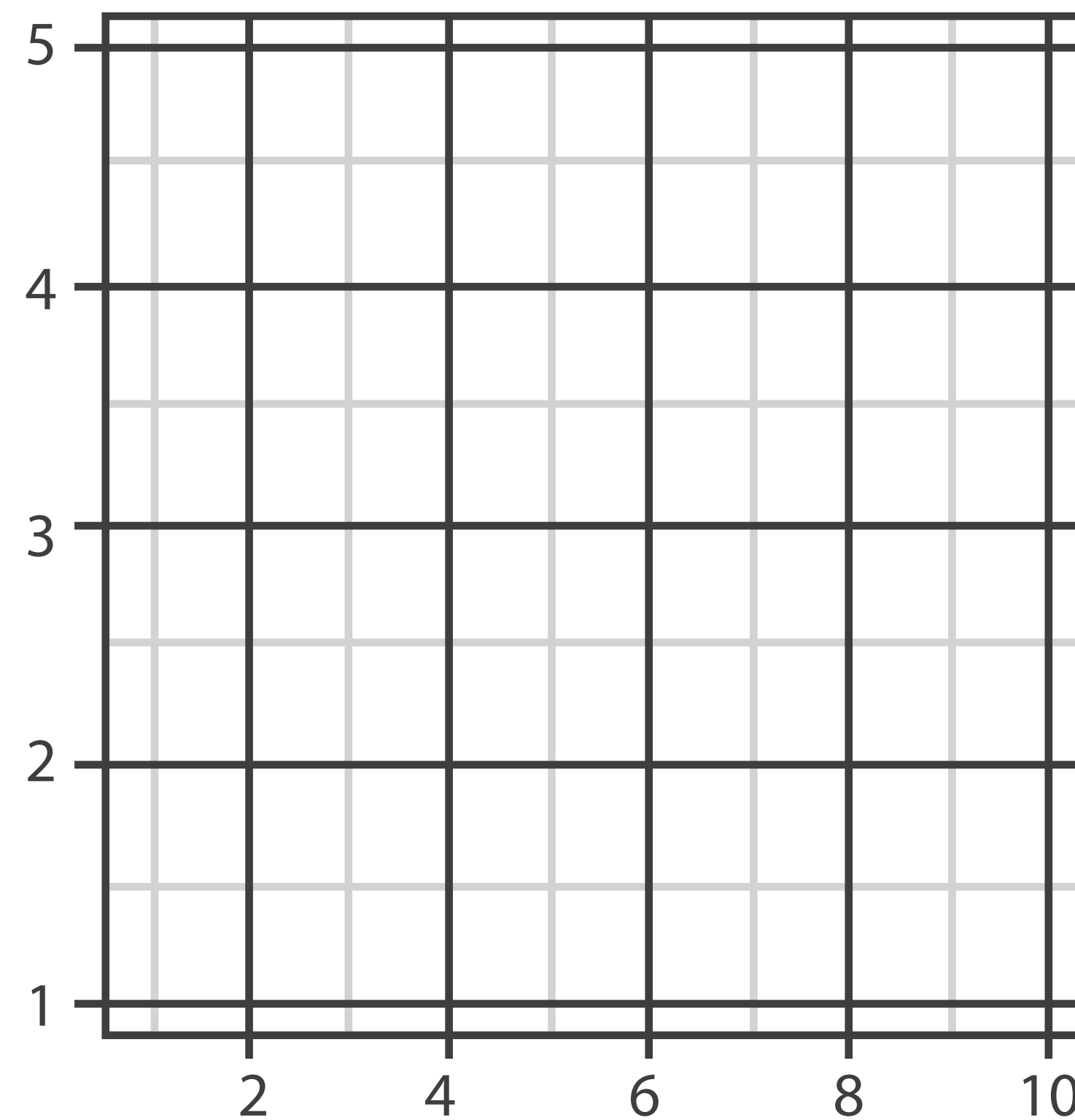
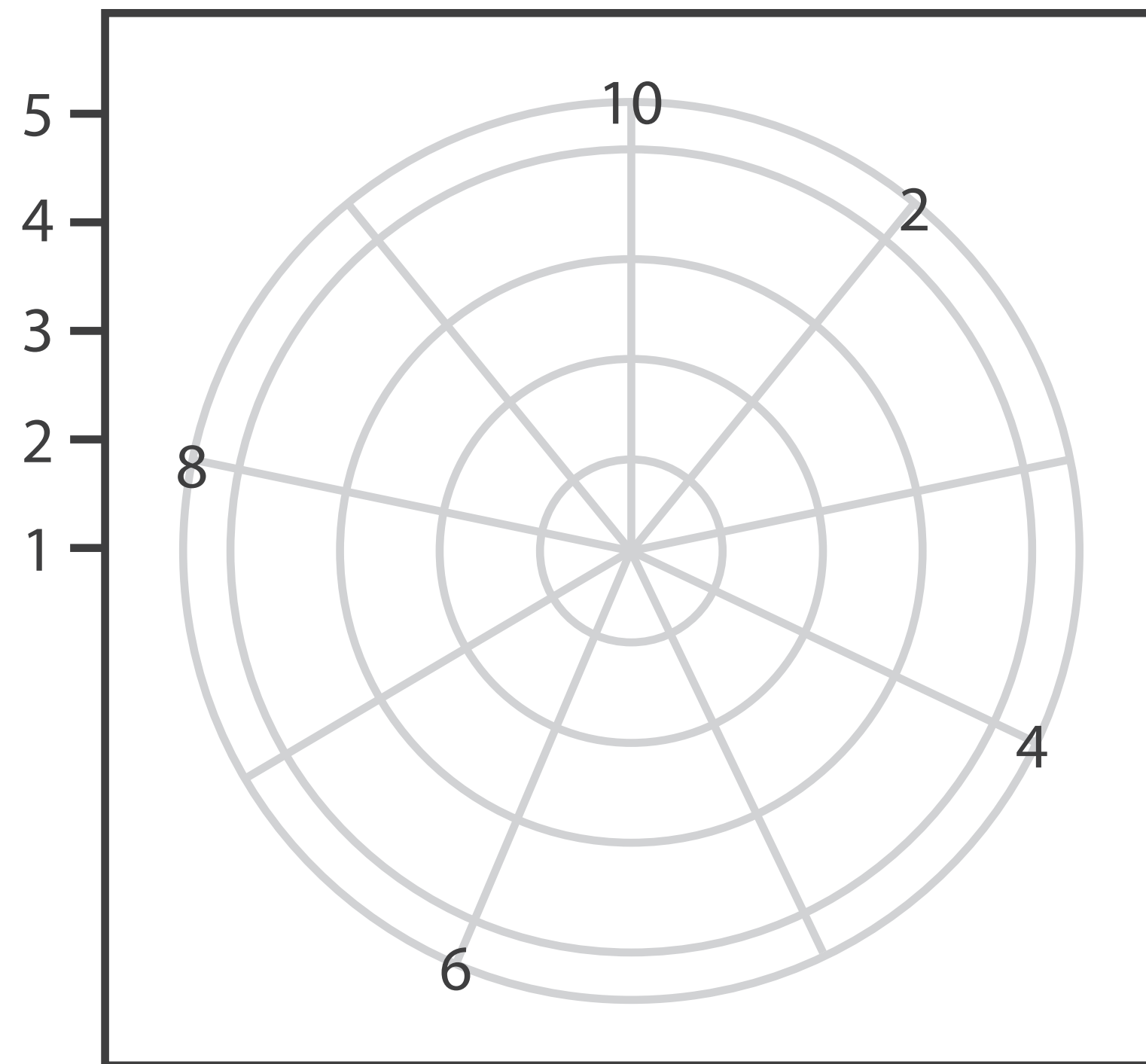


Parallel Coordinates



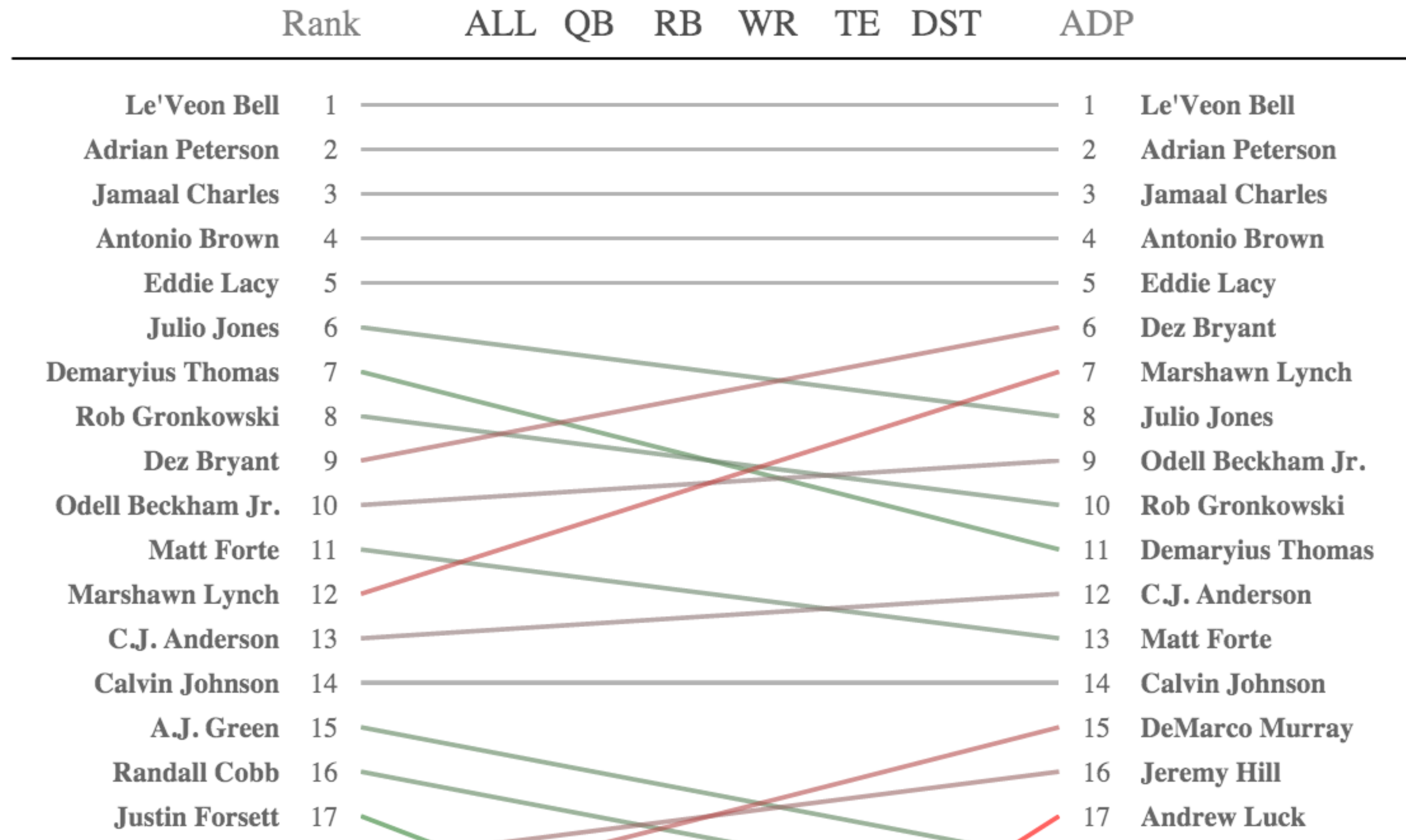


Parallel Coordinates



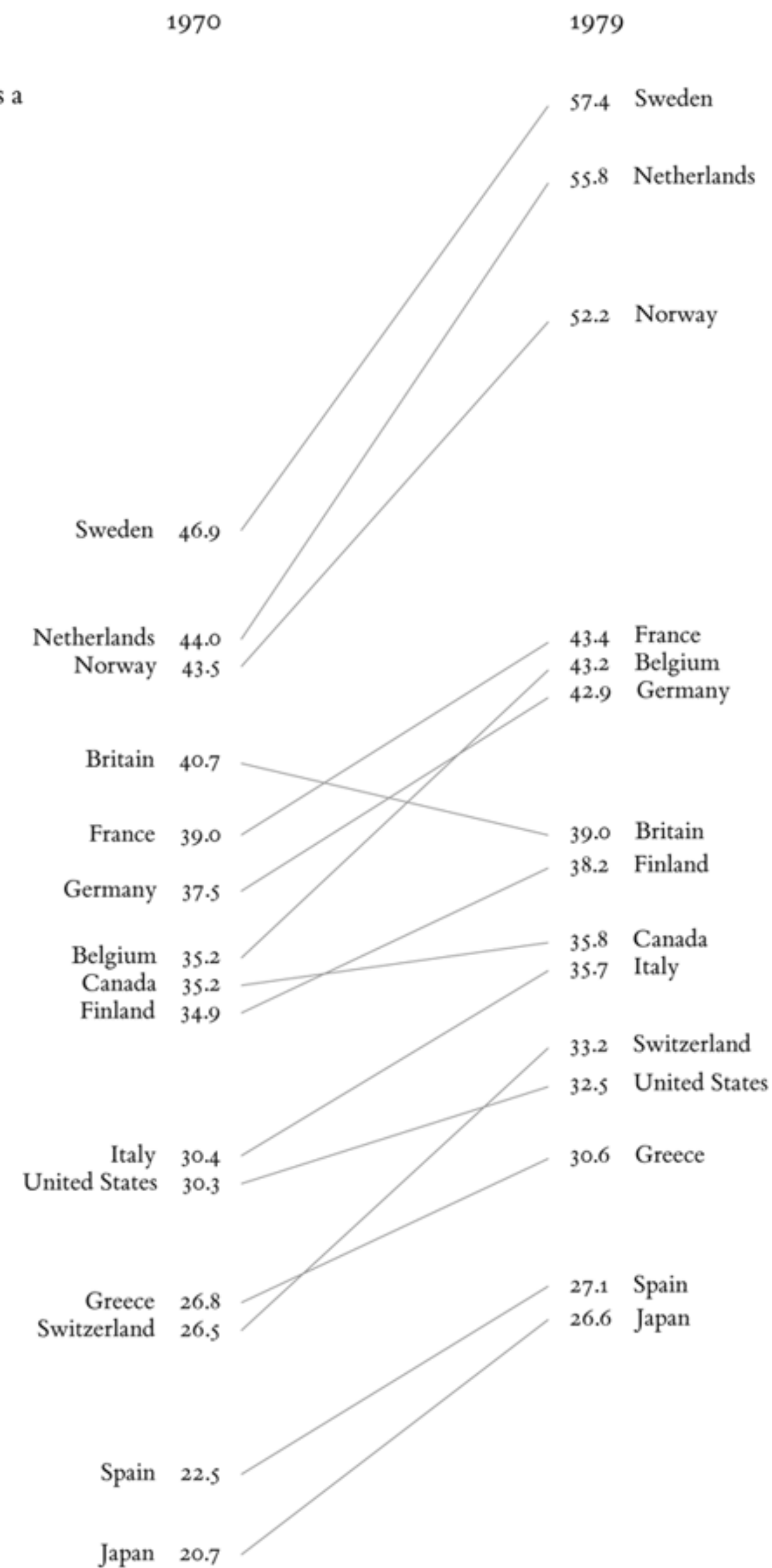
Regular to Radial Bar Chart

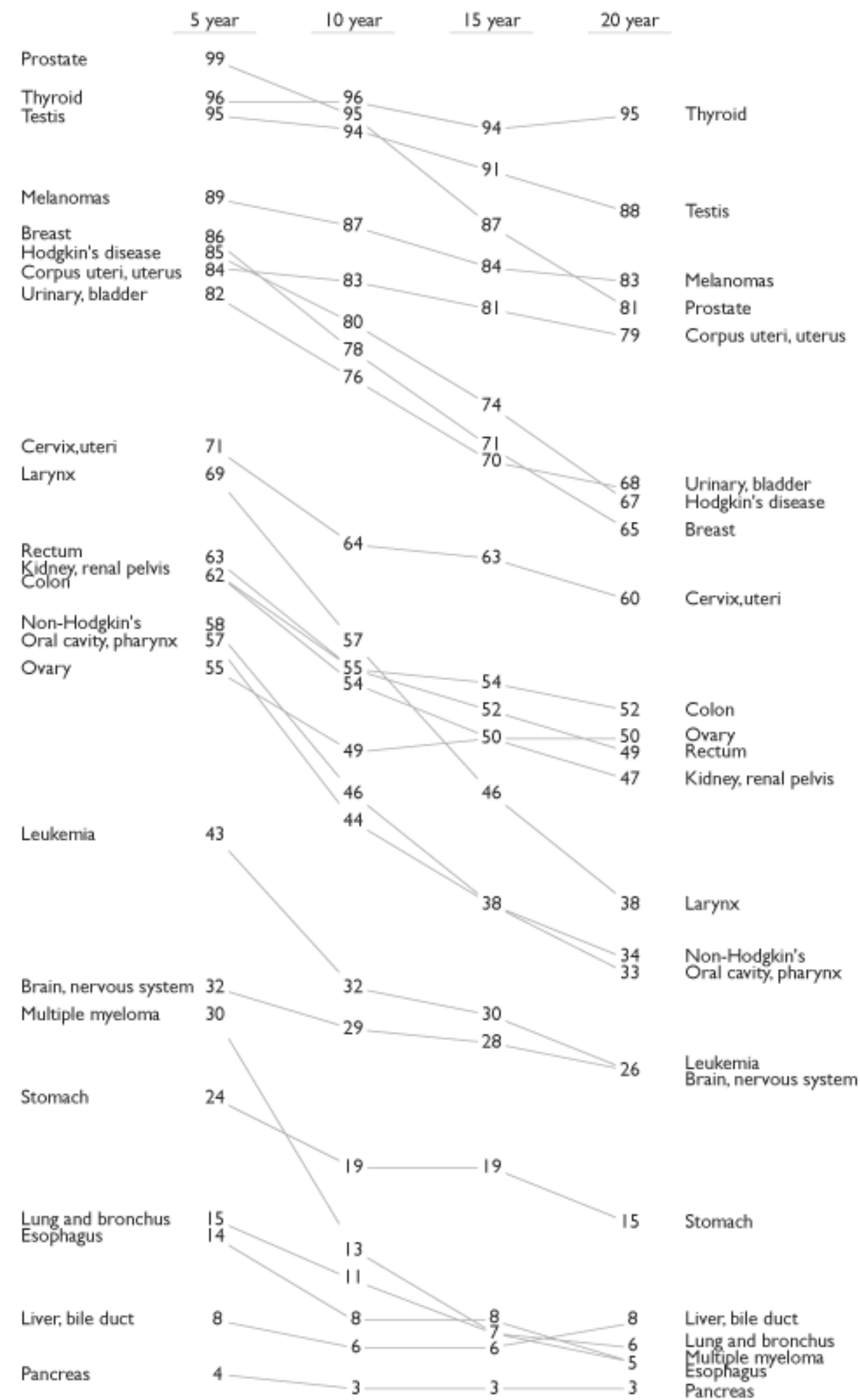
EXPERT CONSENSUS V. DRAFT POSITION



Slopecharts

Current Receipts of Government as a
Percentage of Gross Domestic
Product, 1970 and 1979





*dealing with
dimensions*

reduction:

mds

reduction:

pca

sorting:

automatic

sorting:

user-driven

machine learning

data mining

manipulation

techniques

TableLens

small multiples

large singles

pixel mapping