Data Fluency : Exploring & Describing the Data

Explore Data

Visual Primacy

The benefits

- Easy-to-spot patterns, clusters, gaps & exceptions
- Good for finding the unexpected
- Good for communicating

Holistic

- Numerical summaries are simplifications
- Very different datasets can have identical summaries
- Differences are clear with visualizations

Charts to use

1.
Categories

- Bar charts
- Grouped Bar Charts
- Pie Charts

2.
Quantities

- Dot plots
- Box plots
- Histograms

3.
Associations

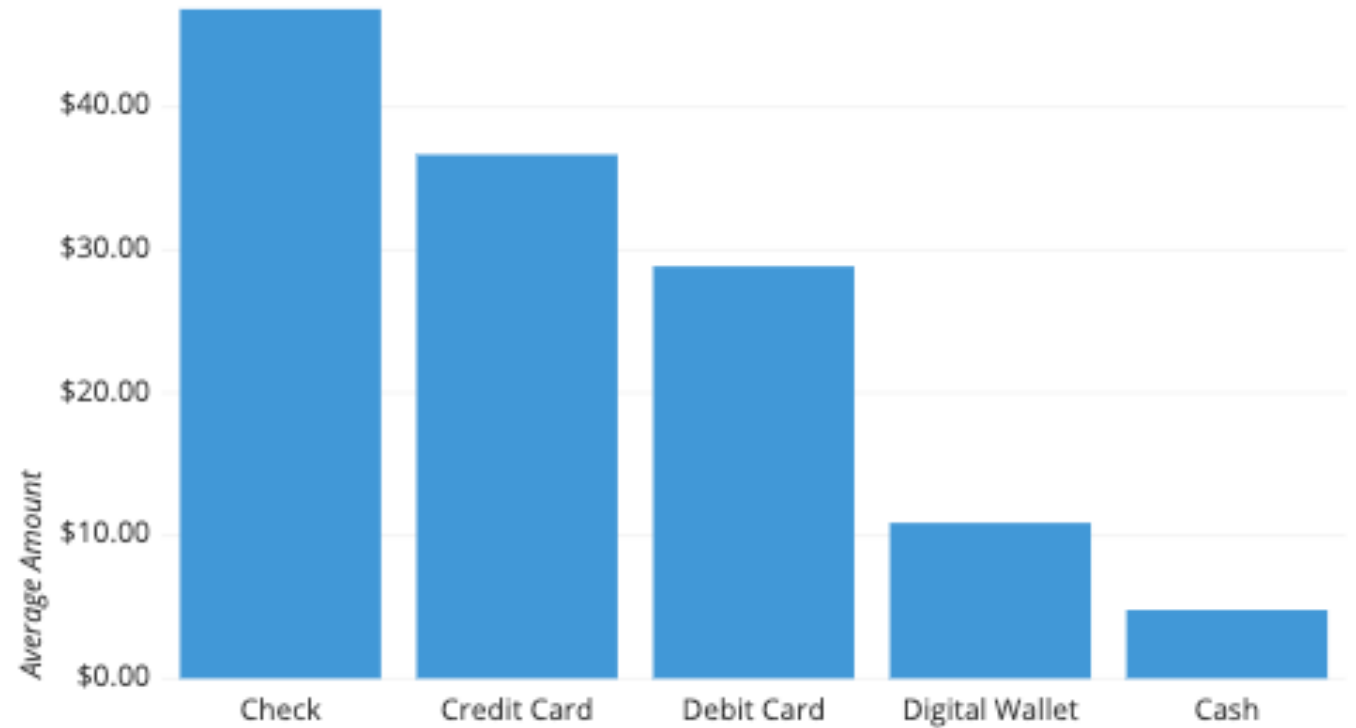- Line Charts
- Sparklines
- Scatterplots

Bar Charts

Bar Charts

- How much? How Many
- Example
  - New Clients vs Returning Clients
  - Views per product
  - Profitability by service

Bar Charts

- Frequency
- Proportion
- Sum
- Average
- Types:
  - Vertical
  - Horizontal

Grouped Bar Charts

Grouped Bar Charts

- How much? How Many?
- Similar to Bar chart
- Difference:
    - Two predicators
    - Two outcomes
    - Two times

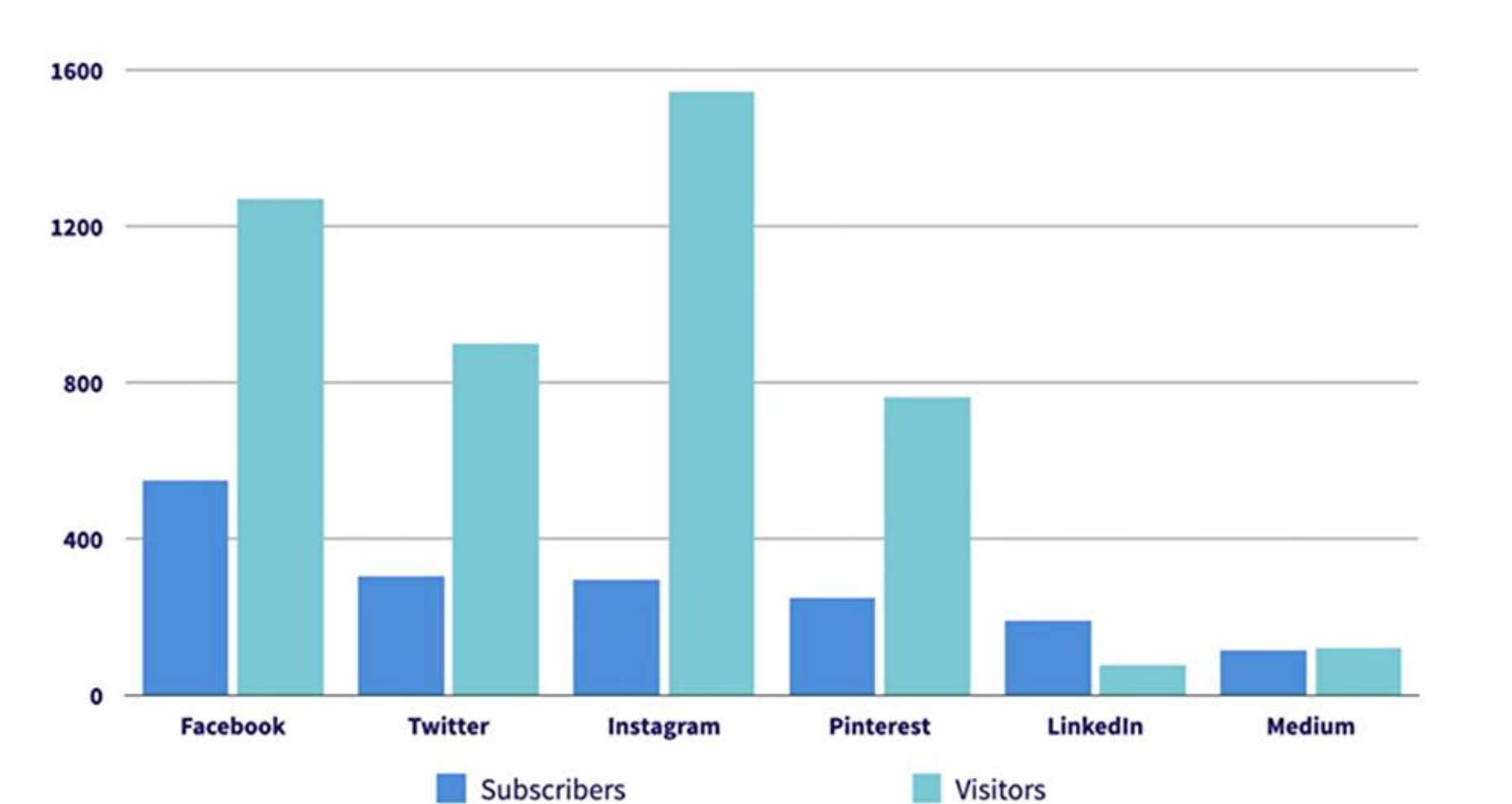# Grouped Bar Charts

1.

Additive Effects

Does each variable have its own independent effect on outcome?
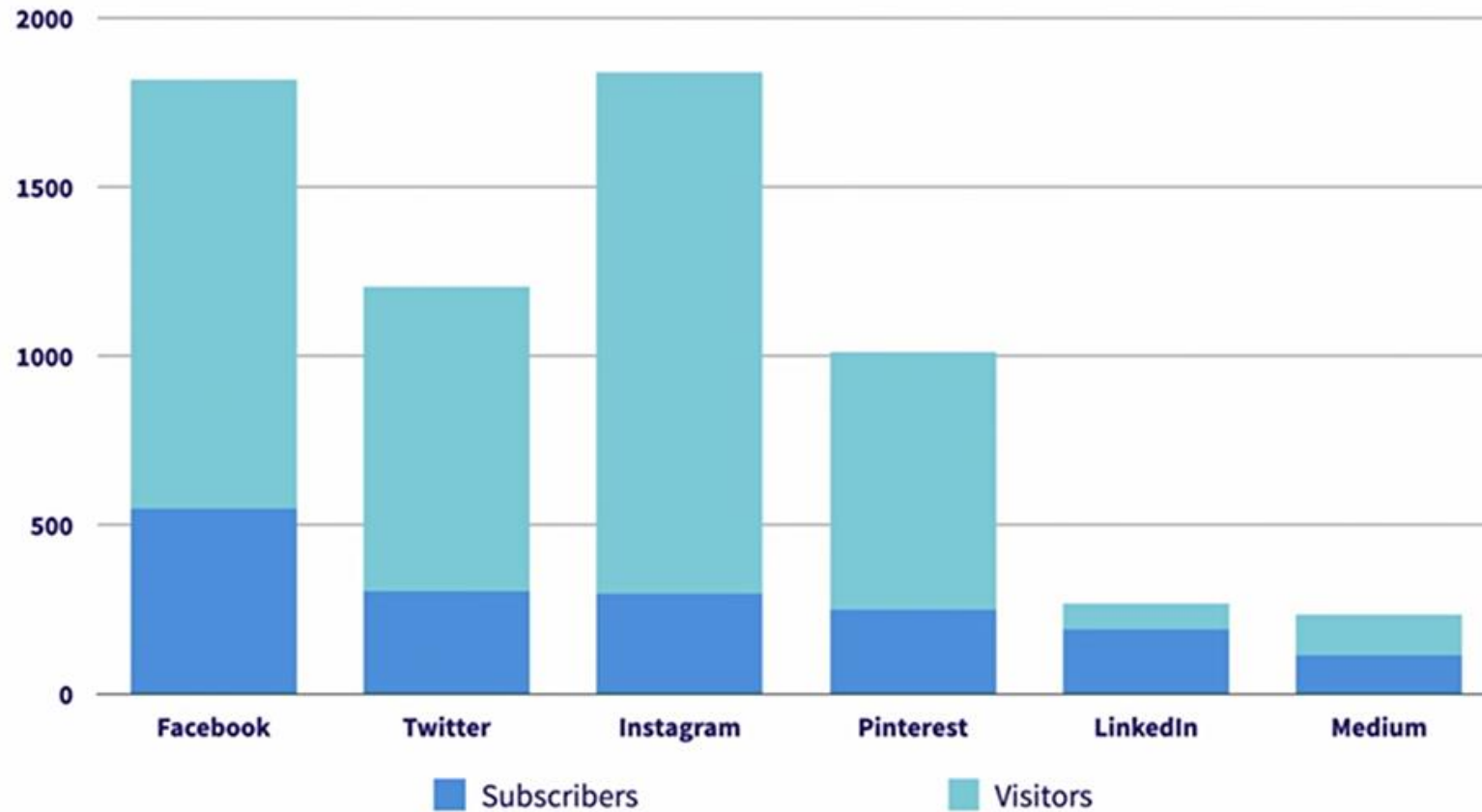
2.

Interactions

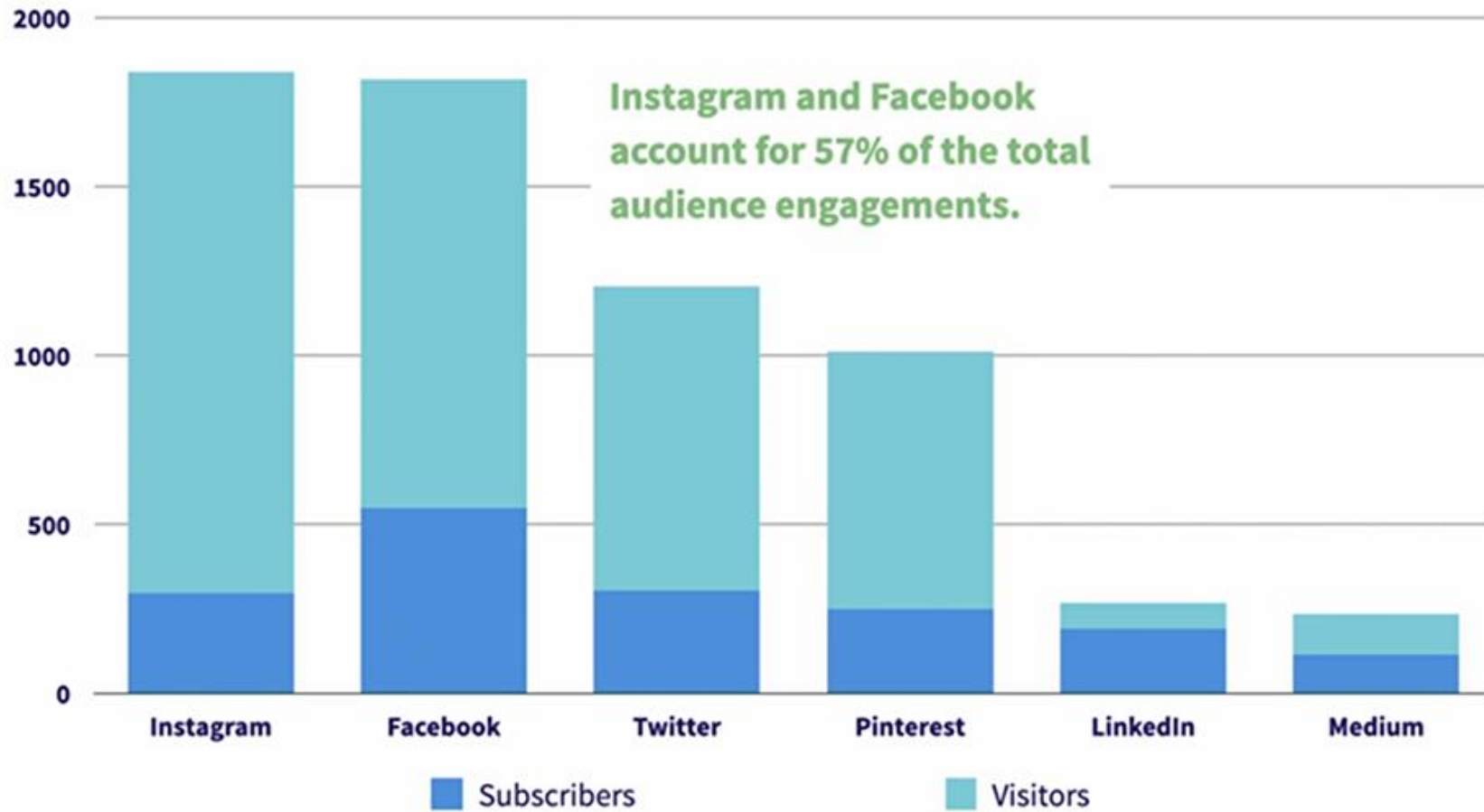The effects on variable depend on the other variable; the differences are different

What Insights we get?

What Insights we get?

What Insights we get?

Instagram and Facebook account for 57% of the total audience engagements.

Pie Charts

Bad reputation

- Pie charts are often called as Chart Junk
- Easy to make bad or misleading pie charts
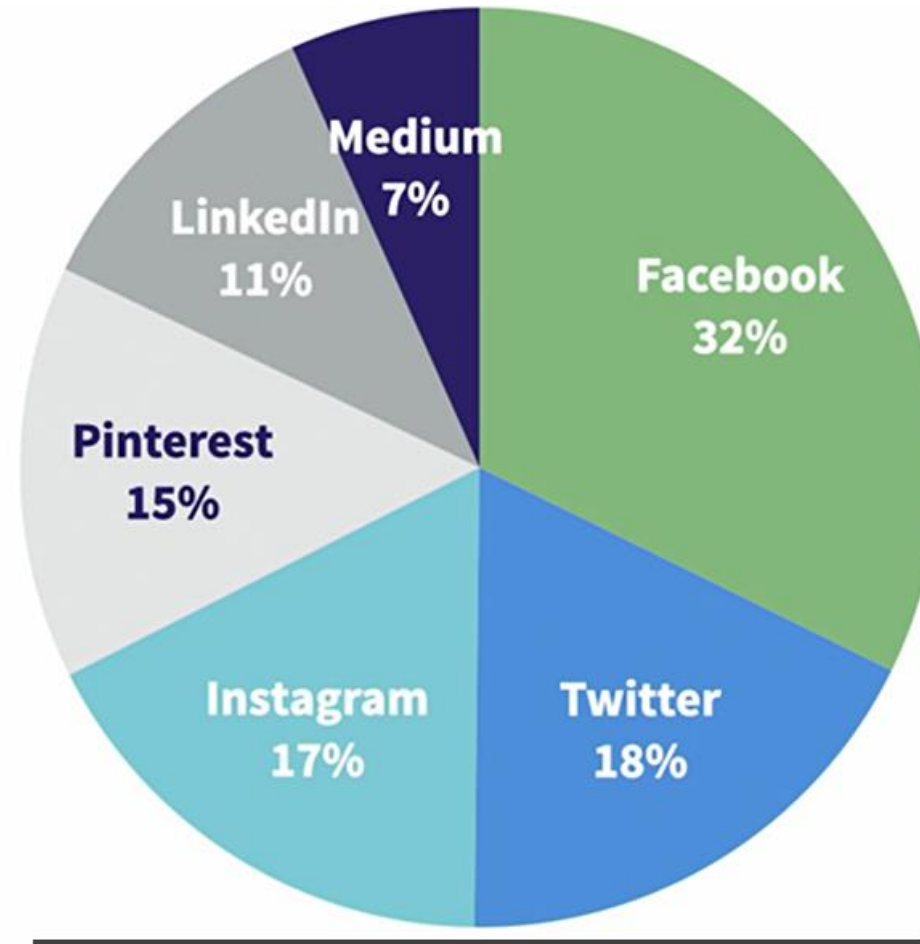- Can be hard to read or interpret

When to use?

- Organization may require pie charts
- Cross-cultural data
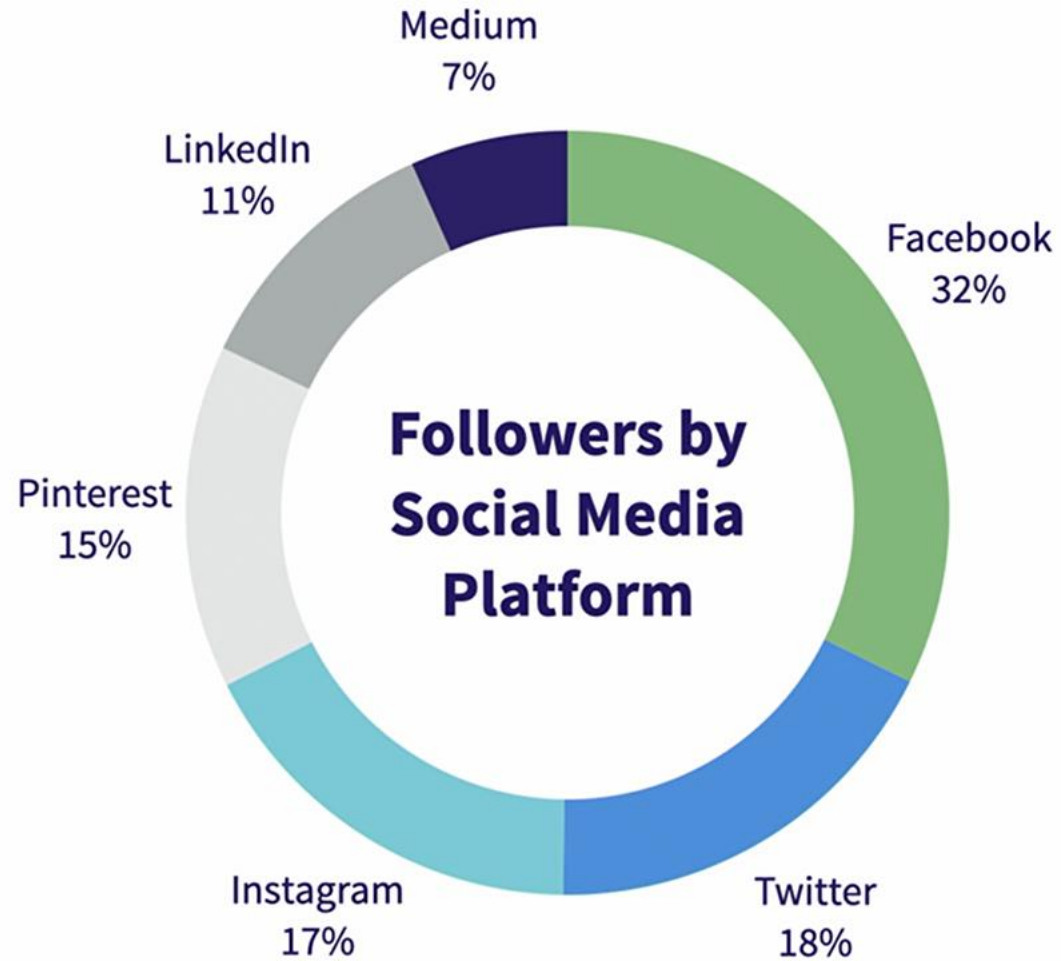- Circular displays and rotary controls are often good UX

What Insights we get?

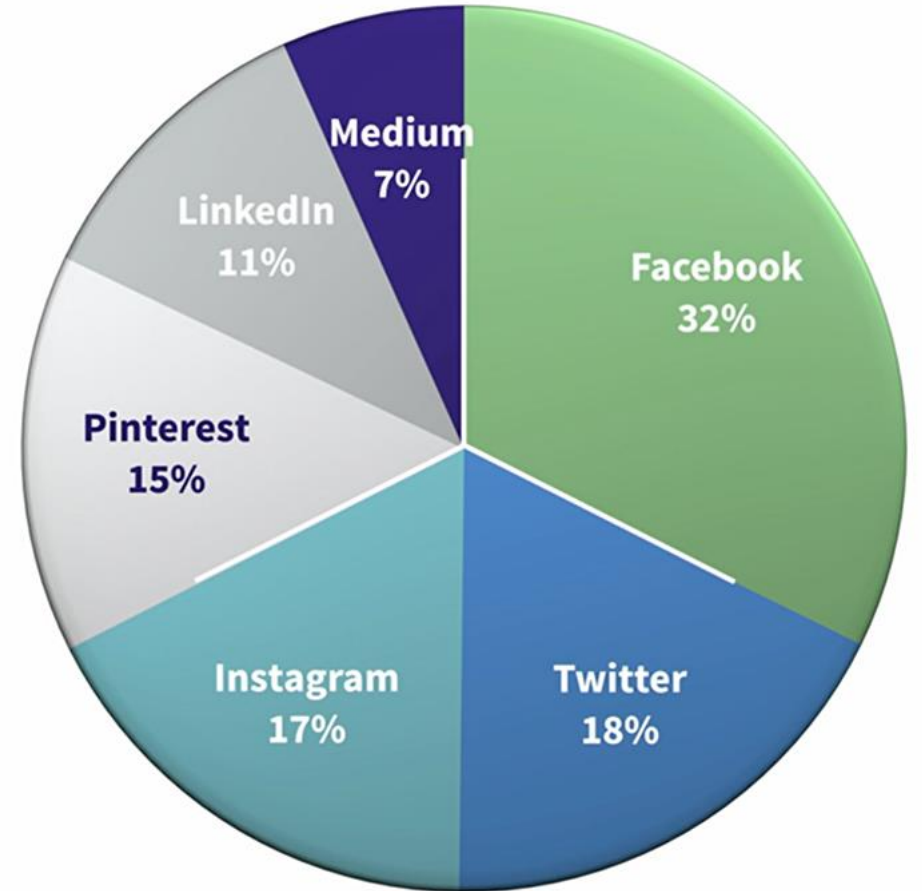| Social Media Platform	Subscribers
Facebook	550
Instagram	296
LinkedIn	191
Medium	114
Pinterest	248
Twitter	305

What Insights we get?

What Insights we get?

What Insights we get?

Facebook:
32% of total
subscribers

What Insights we get?

Left pie chart:
- Facebook 32%
- Twitter 18%
- Instagram 17%
- Pinterest 15%
- LinkedIn 11%
- Medium 7%

Right pie chart:
- Facebook 32%
- Twitter 18%
- Instagram 17%
- Pinterest 15%
- LinkedIn 11%
- Medium 7%

What Insights we get?

Followers by Social Media Platform
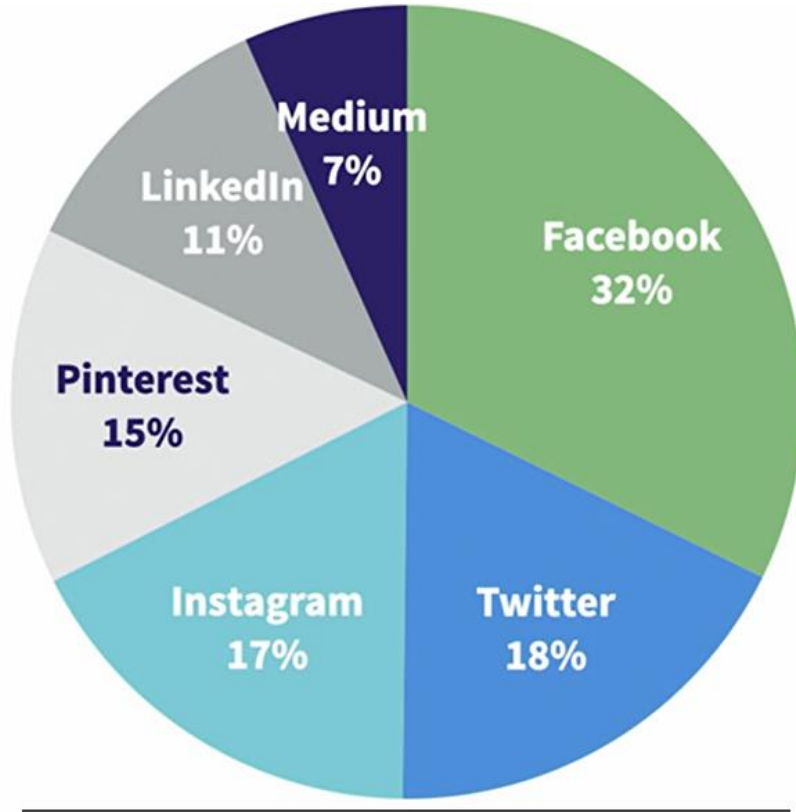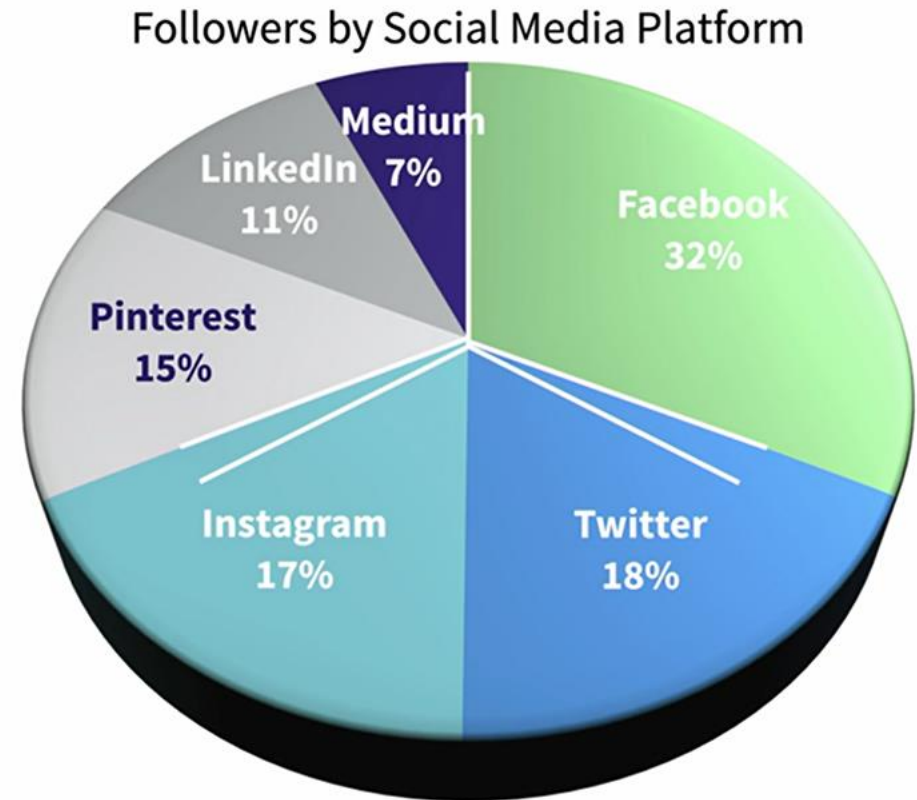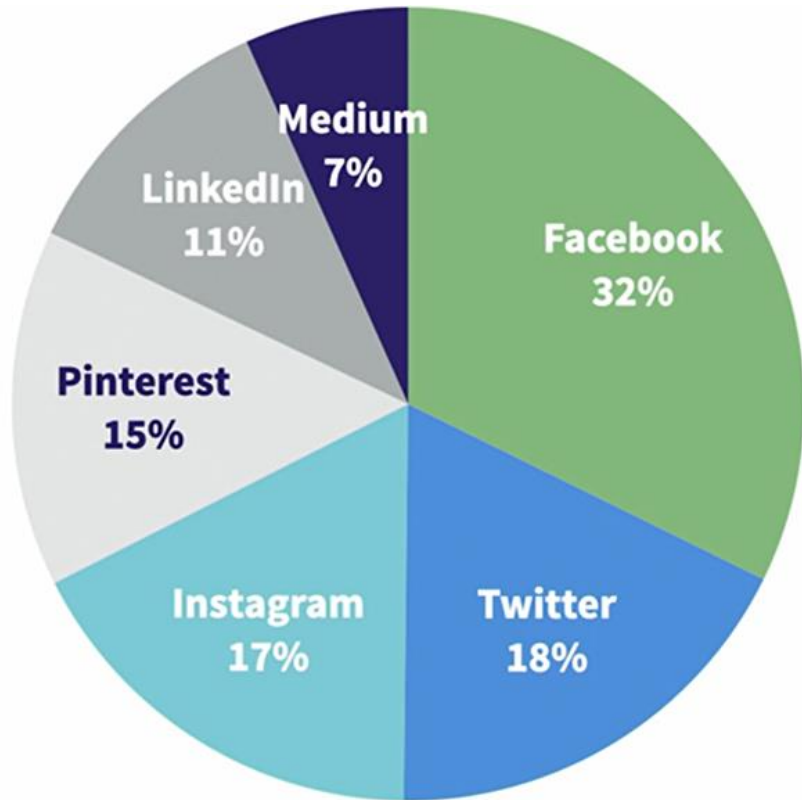
Dot plots

Dot plots

- Shows every single point of data (Does not summarize data)

- Variables

  - Measured or scaled

  - Quantitative or continuous

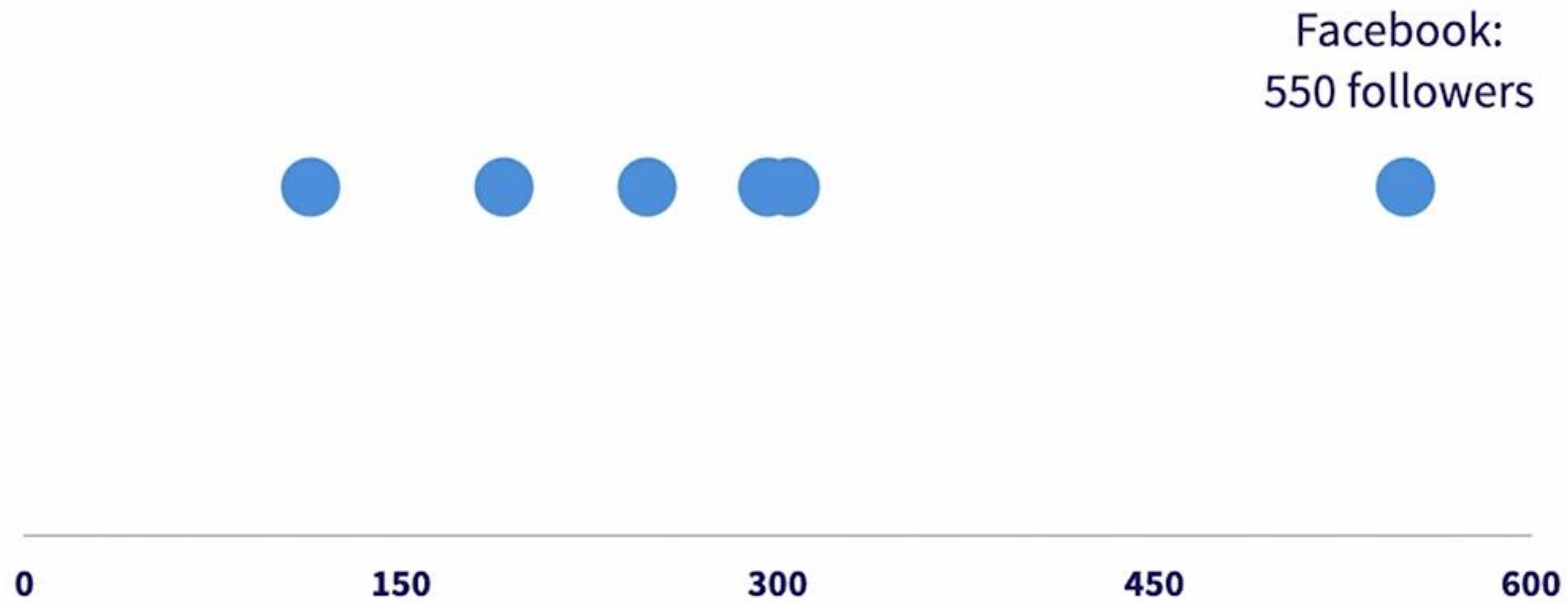 - Interval or ratio level of measurement

Examples

- Number of customer contacts

- Price of product or service

- Distance of commute

- Improvement in well-being
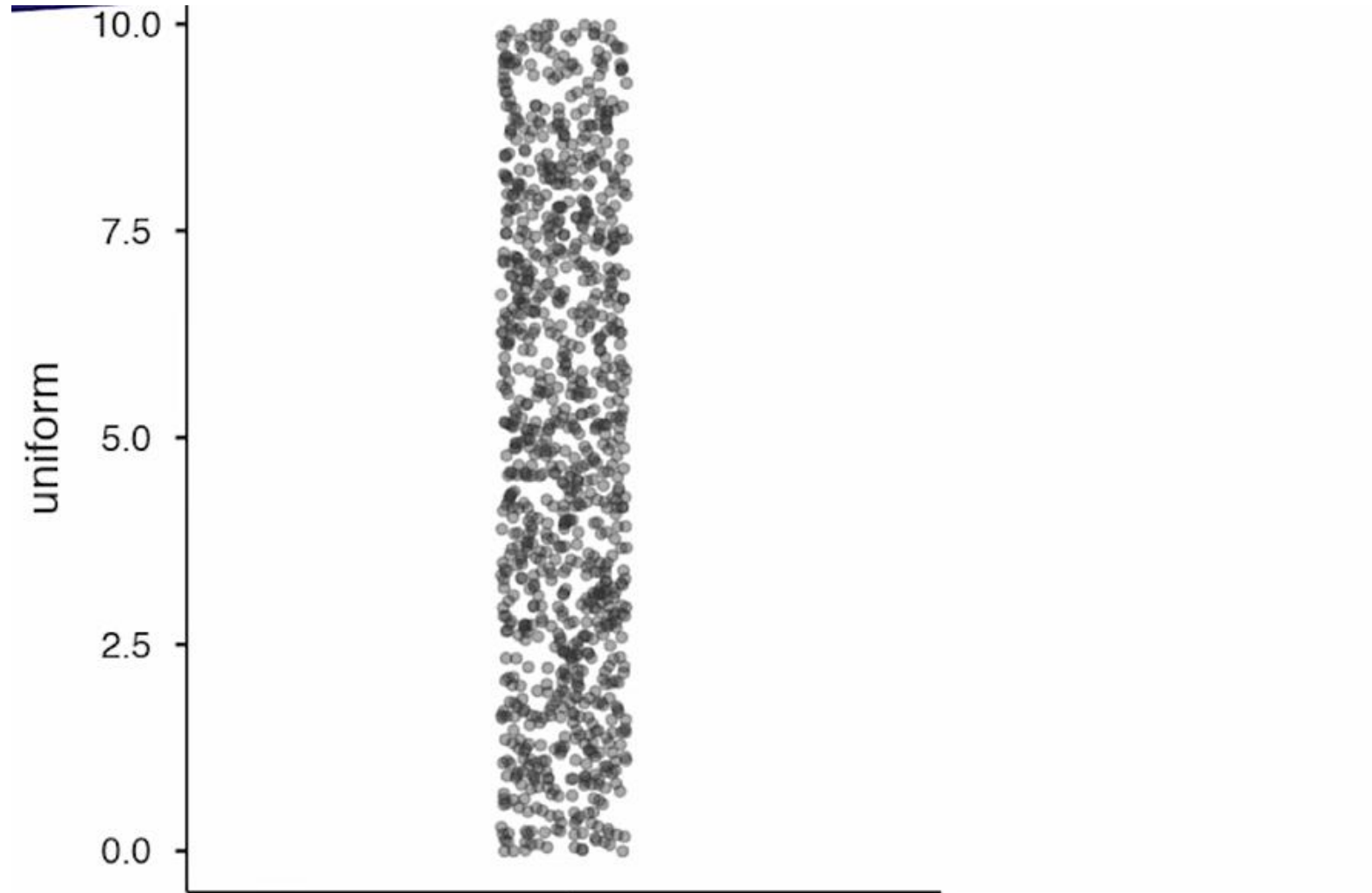
- Time with family and friends

What Insights we get?

- Groups – in data

- Gaps – empty space

- Symmetry

- outliers

What Insights we get?

Facebook:
550 followers

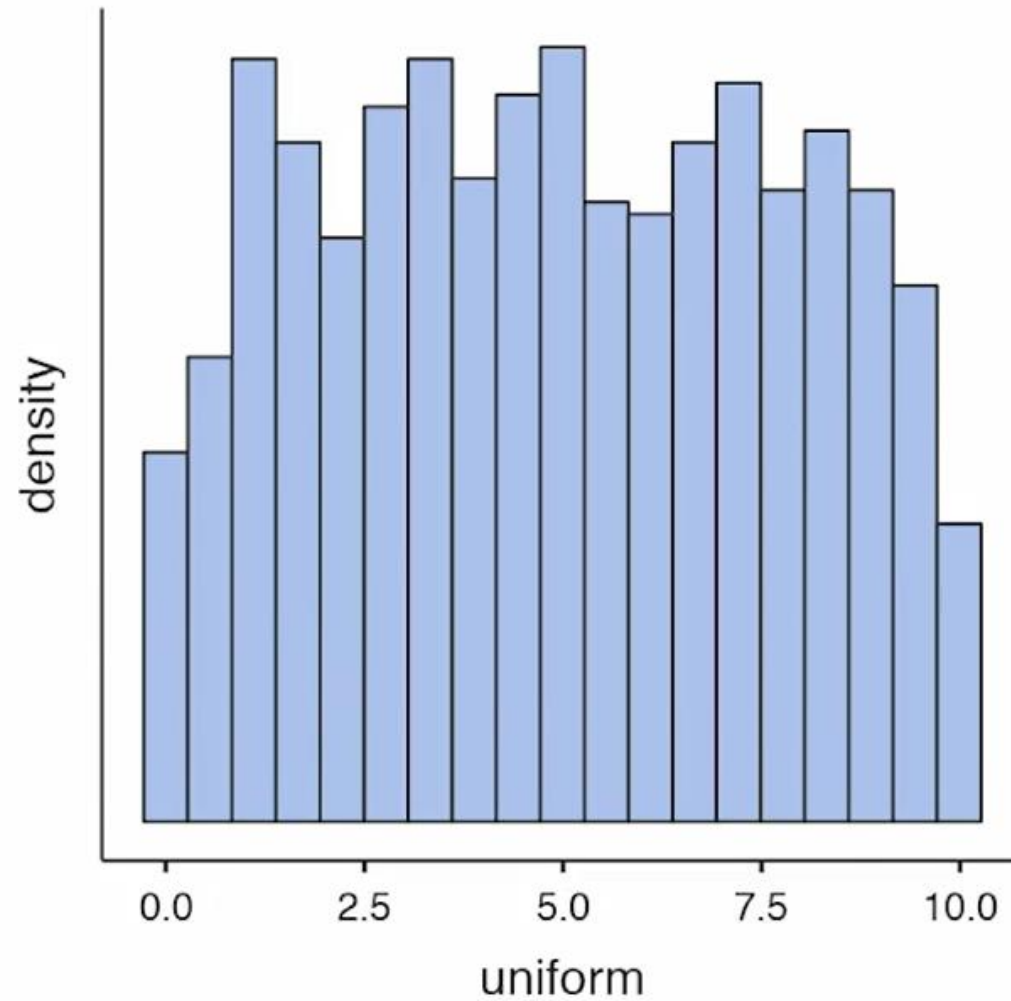| 0 | 150 | 300 | 450 | 600 |

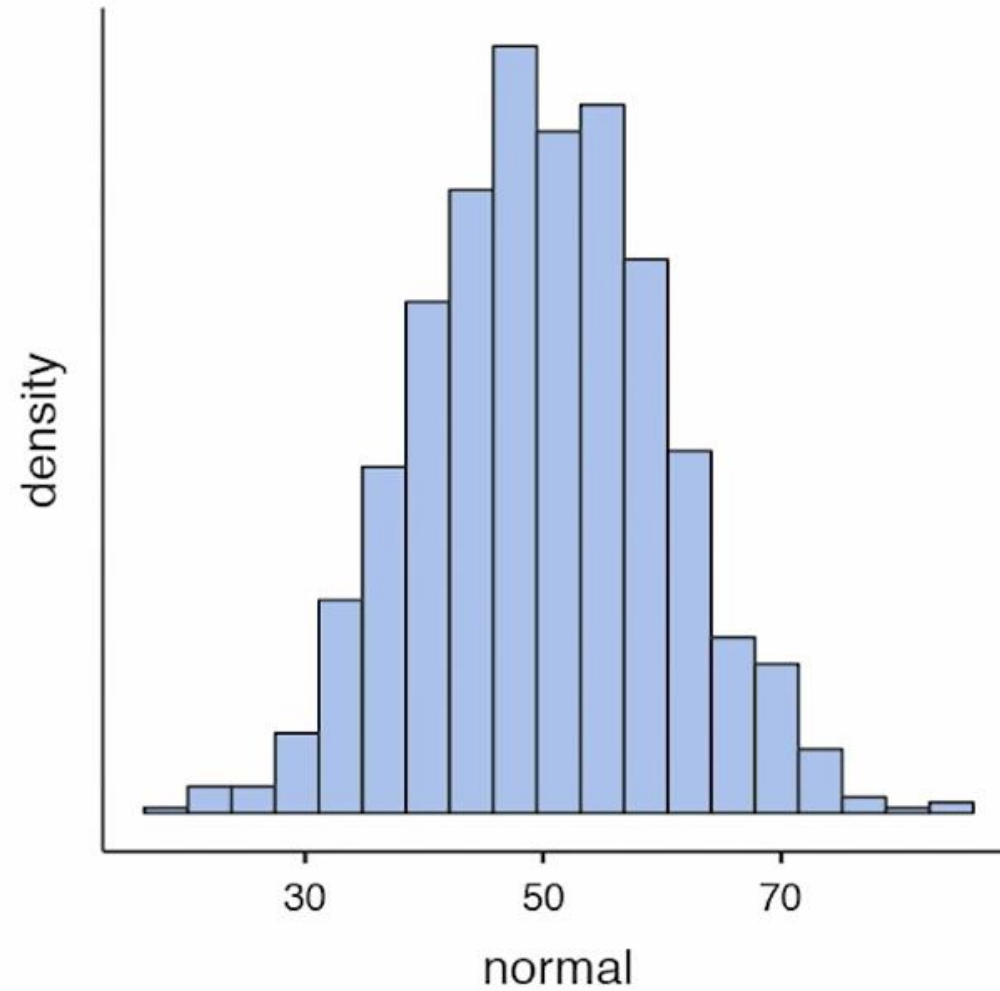# What Insights we get?

Histograms

Shape of data

- What does your data look like?

- Is it symmetrical?

- Is there more than one peak?

- Are there gaps or unusual values?
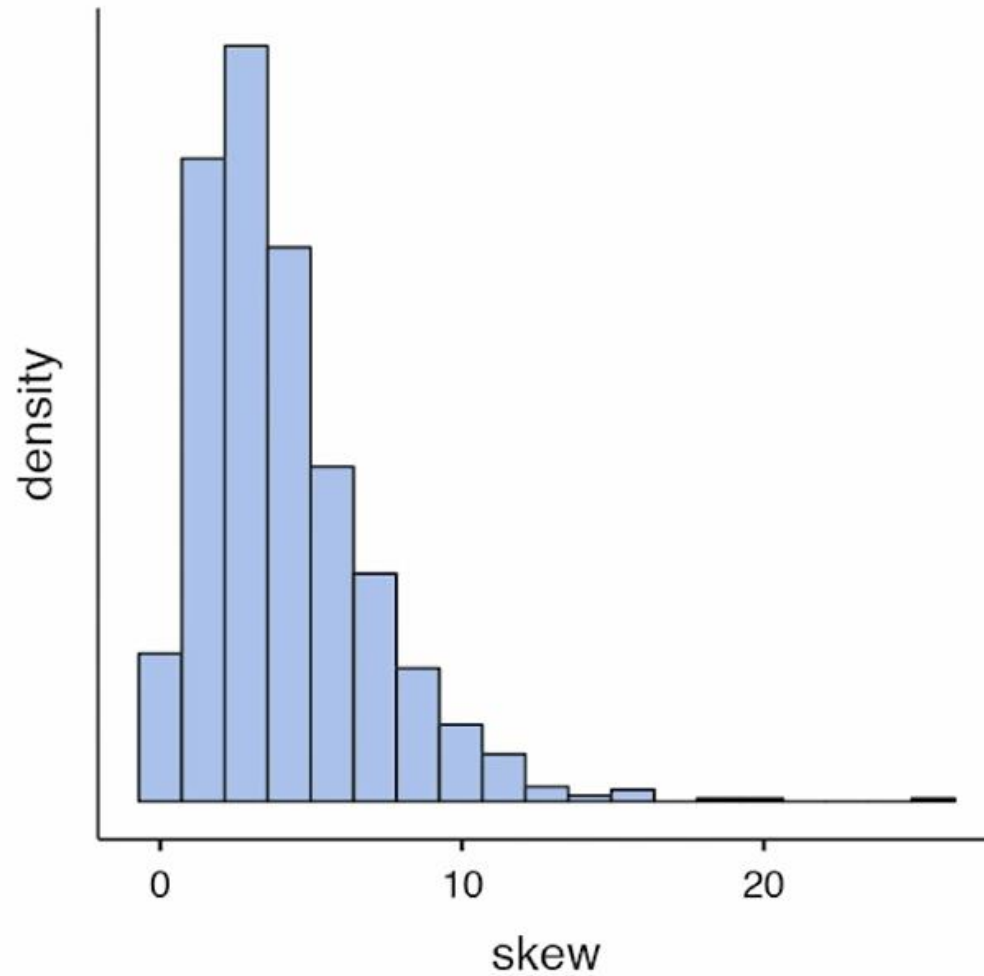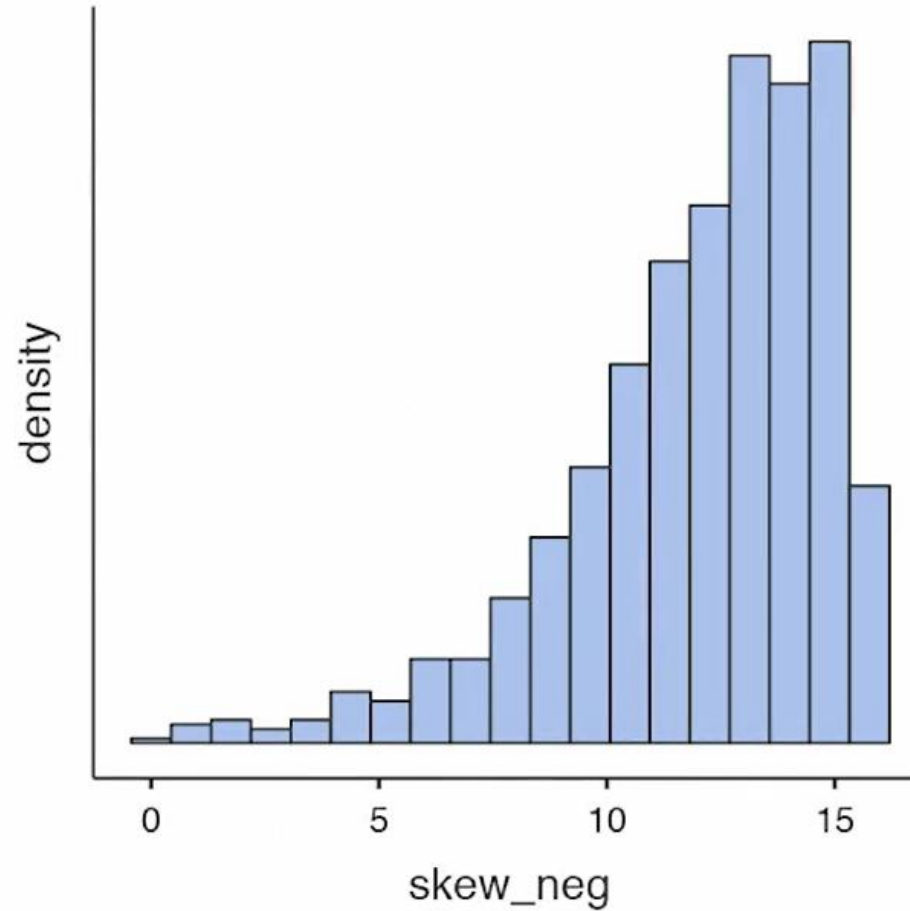
Uniform Distribution

Normal Distribution
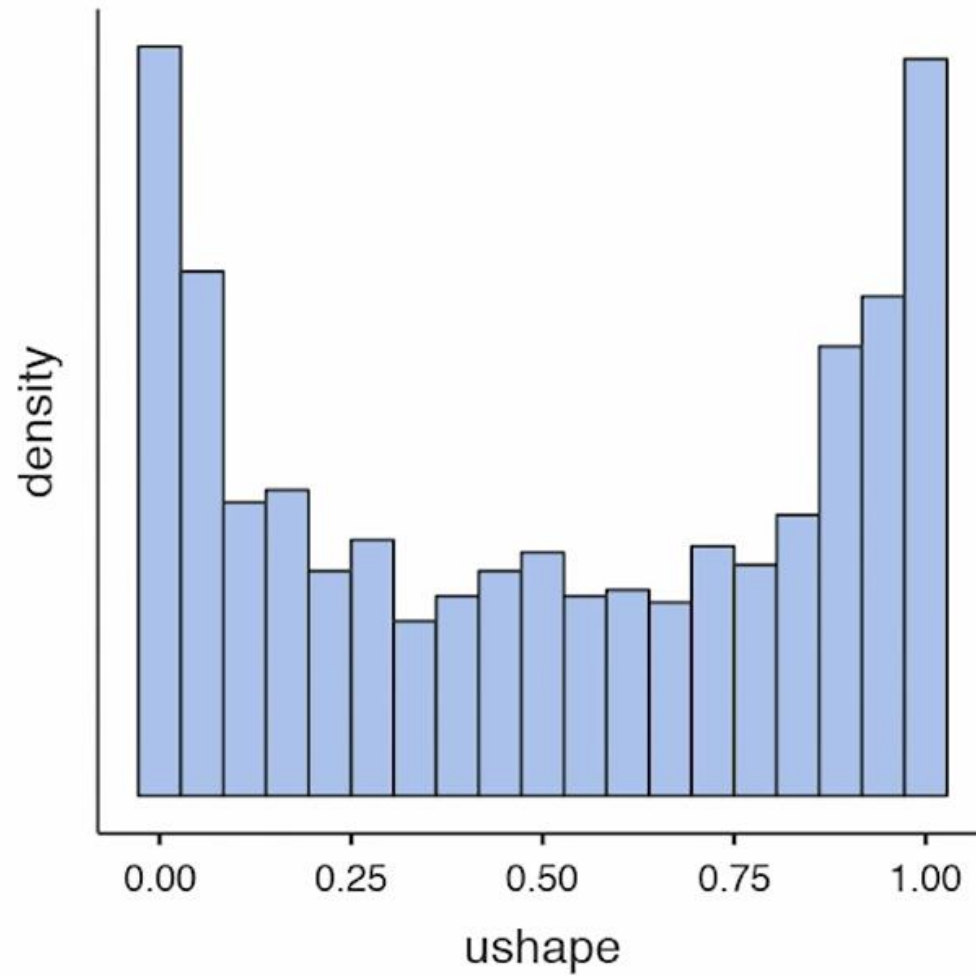
Positively Skewed Distribution

Negatively Skewed Distribution

U Shaped Skewed Distribution

Line Charts

Growth of Business over time

- Linear Growth

- Exponential Growt
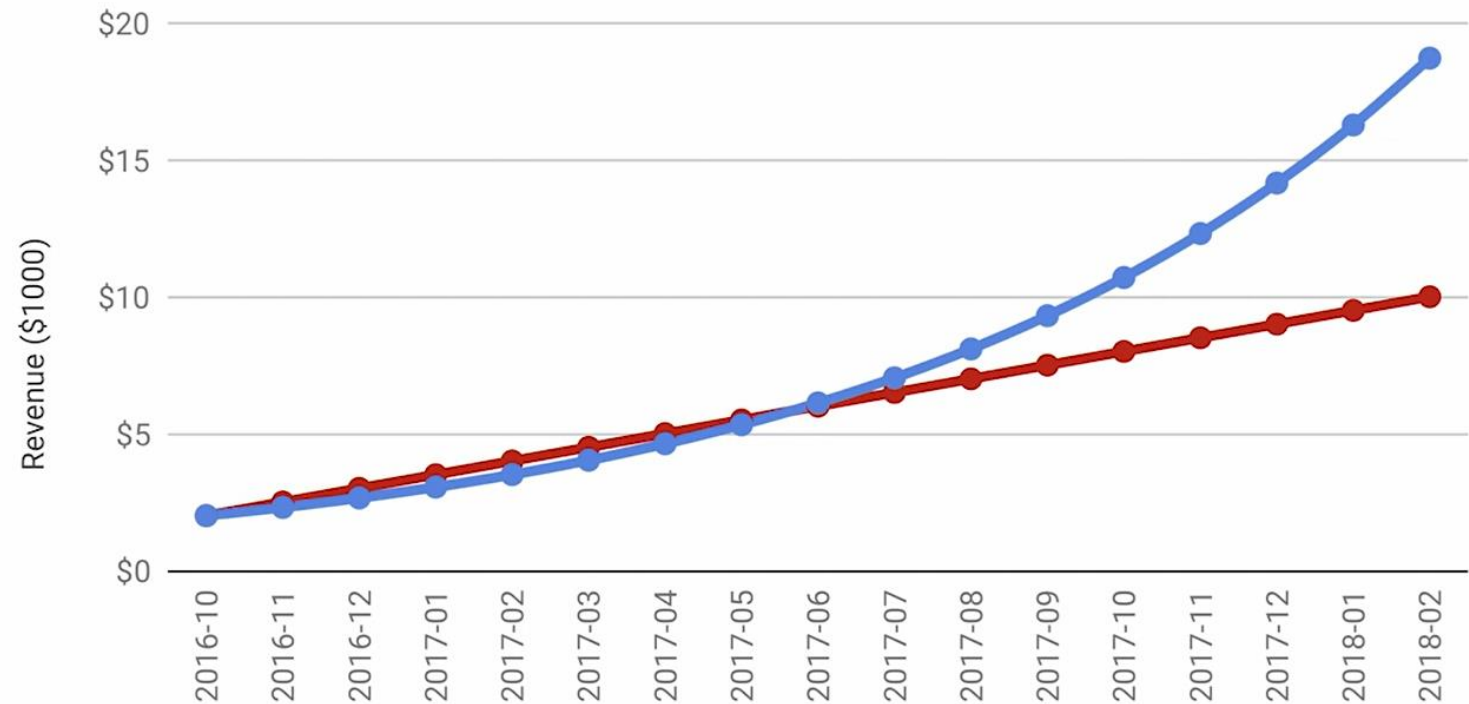
What to look

Patterns

Cycles

Deviations

What Insights we get?

Month	Donations	Events	Grants	Total
2016-10	$3,494	$9,701	$12,000	$25,195
2016-11	$4,054	$6,927	$12,000	$22,981
2016-12	$5,055	$5,925	$12,000	$22,980
2017-01	$5,165	$3,970	$12,000	$21,135

Revenue source by Month

Donations by Months
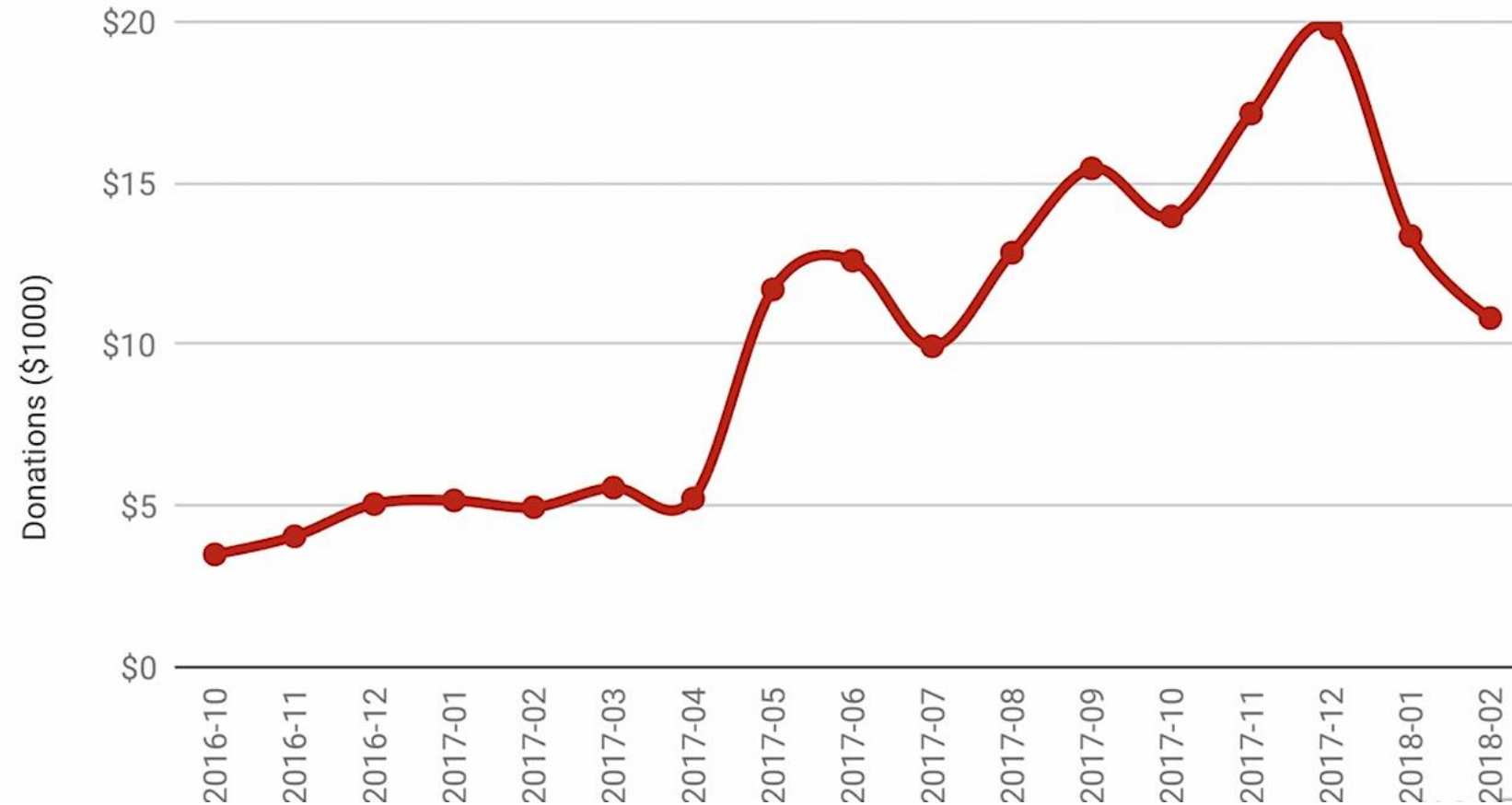
Donations by Month

Revenue by source by Months

Revenue by source by Month

Spark Lines

In-Cell graphics

- Put charts right next to your Data

- Line graphs, bar charts, Win/loss charts

- Often formula based

Example

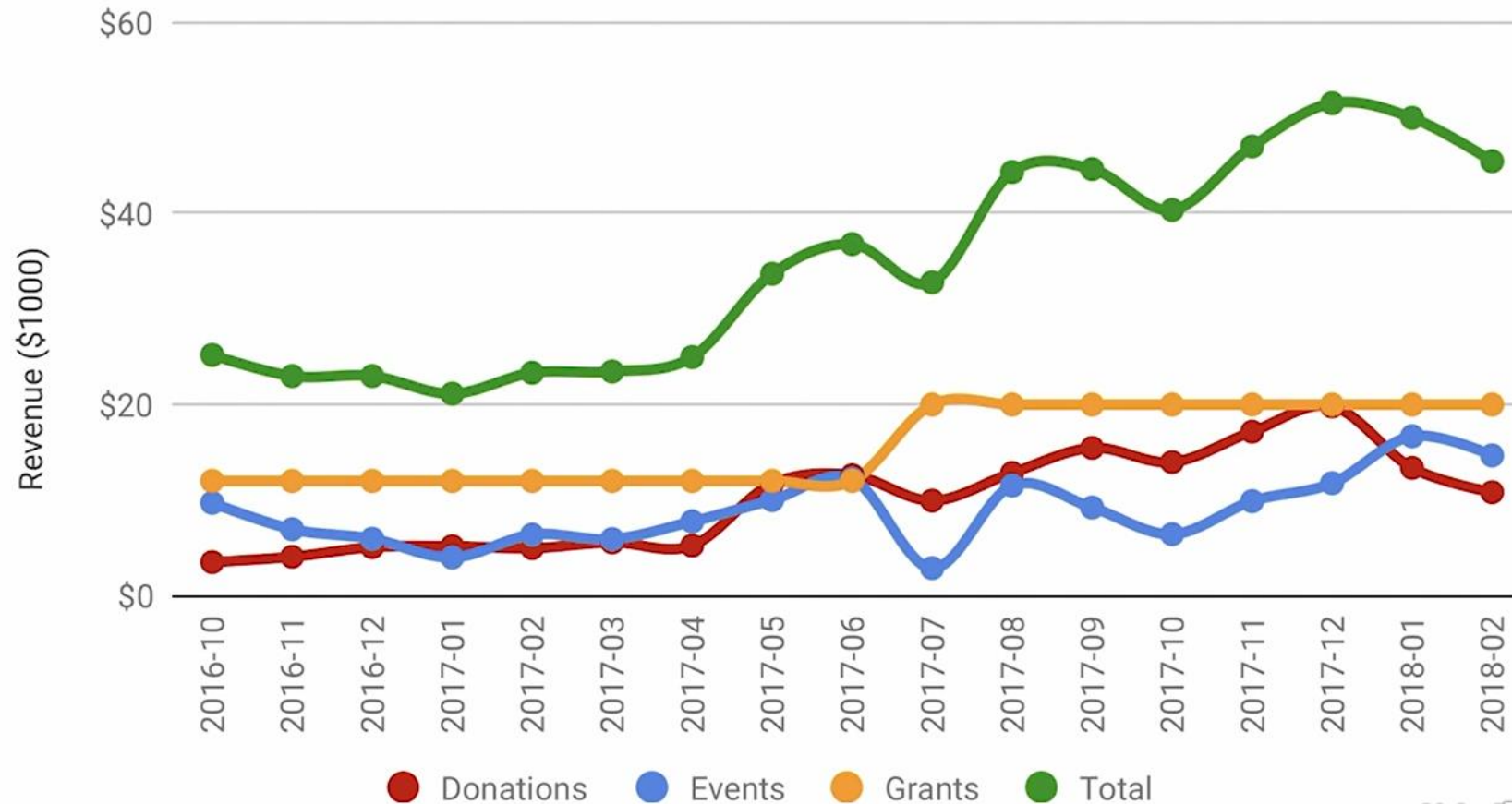|	A	B	C	D	E
1	Month	Donations	Events	Grants	Total
2	2016-10	$3,494	$9,701	$12,000	$25,195
3	2016-11	$4,054	$6,927	$12,000	$22,981
4	2016-12	$5,055	$5,925	$12,000	$22,980
5	2017-01	$5,165	$3,970	$12,000	$21,135
6	2017-02	$4,956	$6,367	$12,000	$23,323
7	2017-03	$5,563	$5,898	$12,000	$23,461
8	2017-04	$5,224	$7,744	$12,000	$24,968
9	2017-05	$11,703	$9,989	$12,000	$33,692
10	2017-06	$12,599	$12,199	$12,000	$36,798
11	2017-07	$9,942	$2,857	$20,000	$32,799
12	2017-08	$12,842	$11,504	$20,000	$44,346
13	2017-09	$15,455	$9,205	$20,000	$44,660
14	2017-10	$13,968	$6,411	$20,000	$40,379
15	2017-11	$17,157	$9,873	$20,000	$47,030
16	2017-12	$19,802	$11,761	$20,000	$51,563
17	2018-01	$13,361	$16,672	$20,000	$50,033
18	2018-02	$10,817	$14,664	$20,000	$45,481
19	Sparkline				

Example

	A	B	C	D	E
1	**Month**	**Donations**	**Events**	**Grants**	**Total**
2	2016-10	$3,494	$9,701	$12,000	$25,195
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19	**Sparkline**				

Example

Example- Win Loss chart

f_x =SPARKLINE(G2:G18, {"charttype","winloss"})

	G	◄ ►	M	N	O
1	**Win/Loss**				
2	1				
3	1				
4	0				
5	0				
6	-1				
7	1				
8	-1				
9	-1				
10	-1				
11	1				
12	1				
13	-1				
14	1				
15	1				
16	1				
17	1				
18	1				
19					
20					

Example- Bar Chart

Example- Hacked Bar Chart

The image shows a spreadsheet with the formula `=REPT("|", B2)` in the formula bar.

	A	B	C
1	Social Media Followers	Count	Chart
2	Facebook	50	||||||||||||||||||||||||||||||||||||||||||||||||||
3	Twitter	30	||||||||||||||||||||||||||||||
4	Instagram	26	||||||||||||||||||||||||||
5	Pinterest	24	||||||||||||||||||||||||
6	LinkedIn	19	|||||||||||||||||||
7	Medium	11	|||||||||||

Scatter Plots

In-Cell graphics

- Plot the associations between two quantitative or continuous variables

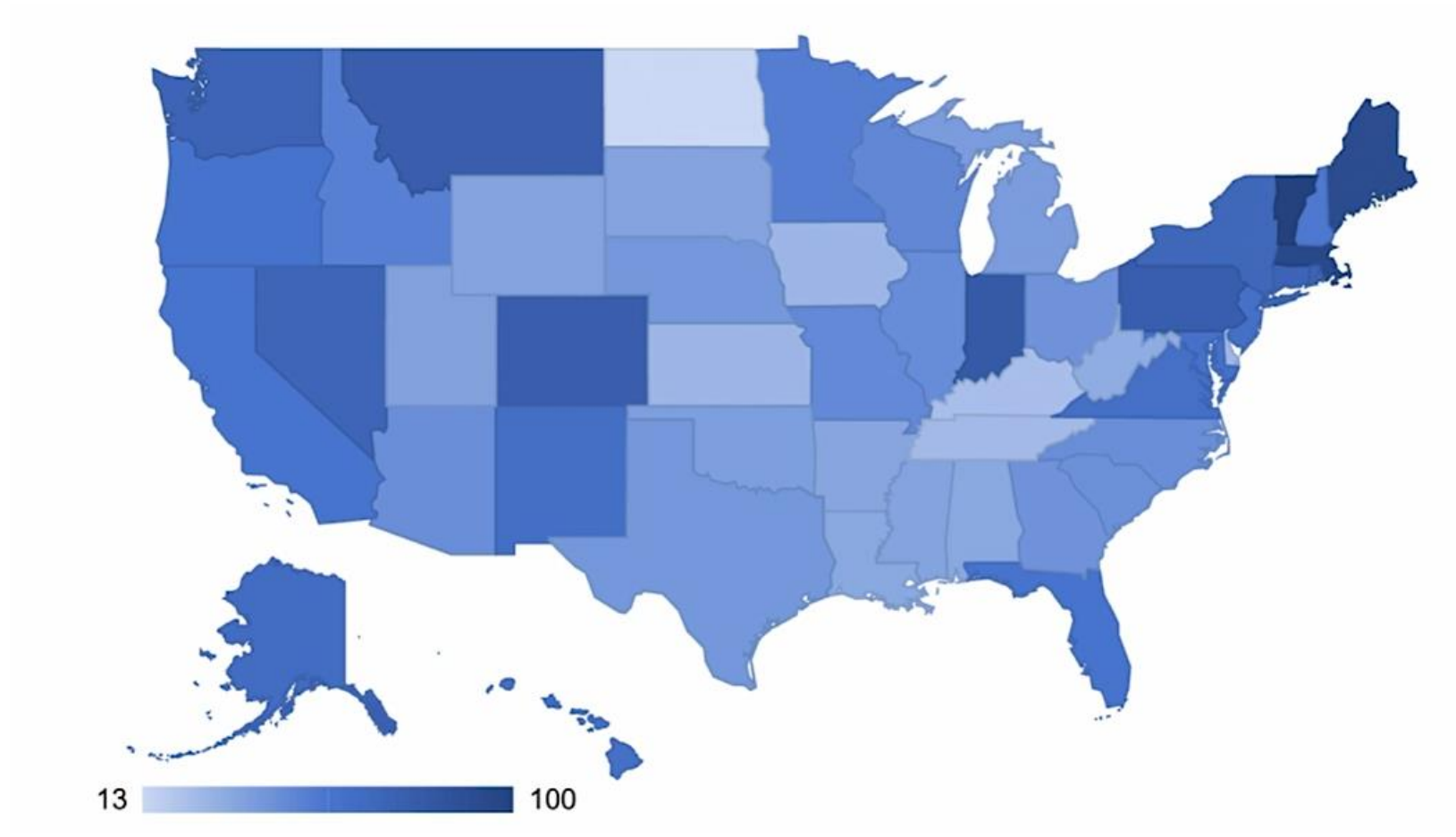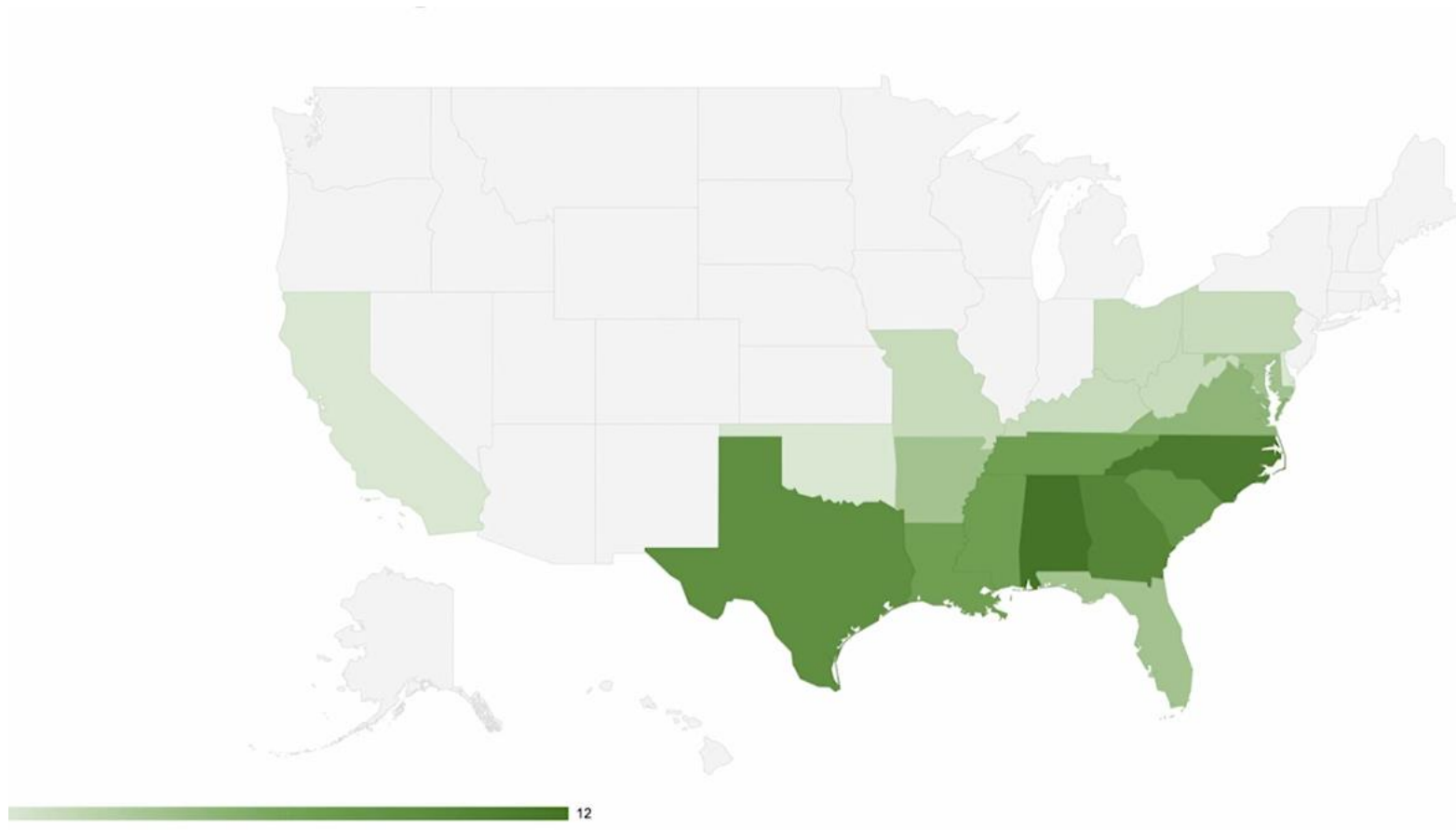- Can draw regression line or prediction line to summarize relationships

Things to consider

Past Data

Correlational

Linear

Extrapolation
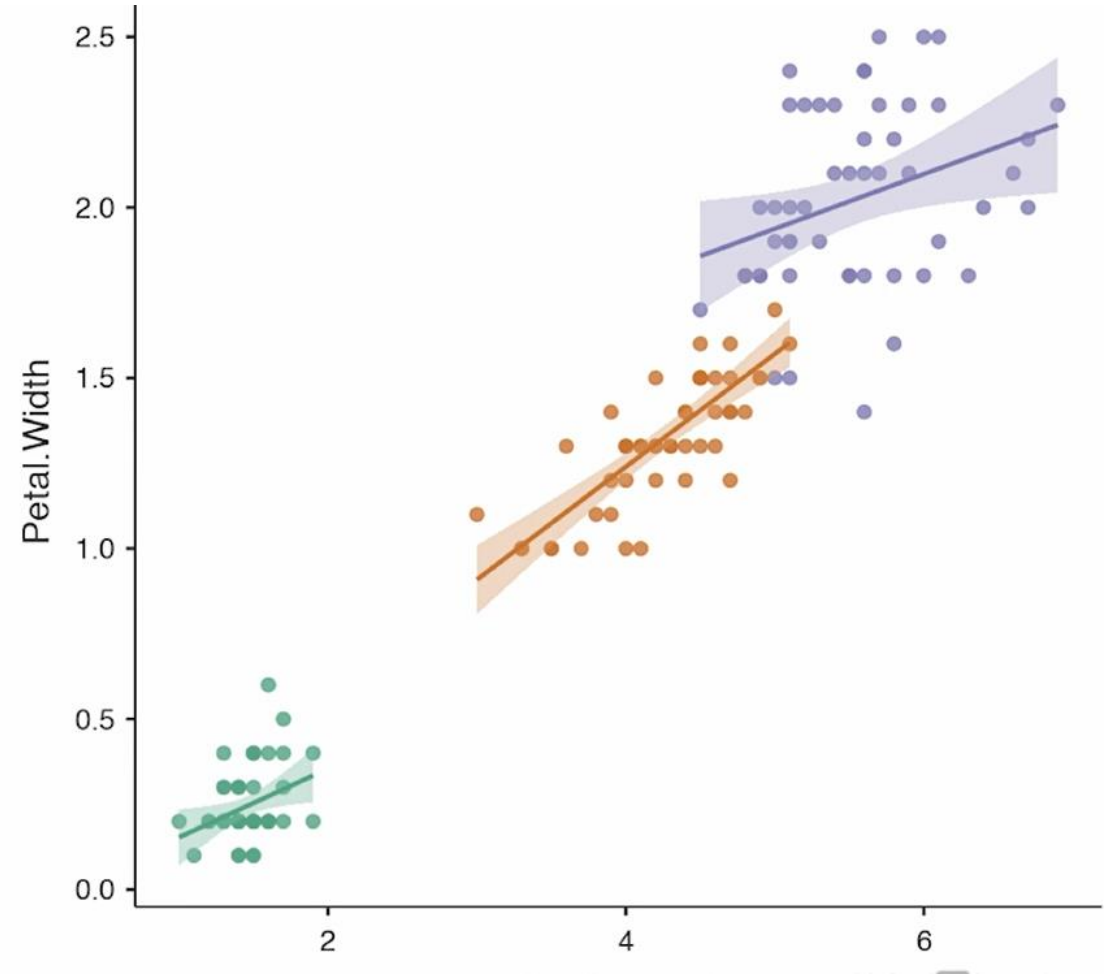
Data Maps

Choropleth Map: Yoga Studio

13 ▢▢▢▢ 100

Covid Cases by State

Covid Cases by State