

# **Datavzrd**

**Rapid programming- and maintenance-free interactive  
visualization and communication of tabular data**

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ESSEN**

# Data-analyses need tables



# Excel

Me: Types 12.25

Excel: 12/25/2020

Me: \*Deletes\*, types in 12.25

Excel:



# Data-analyses need tables



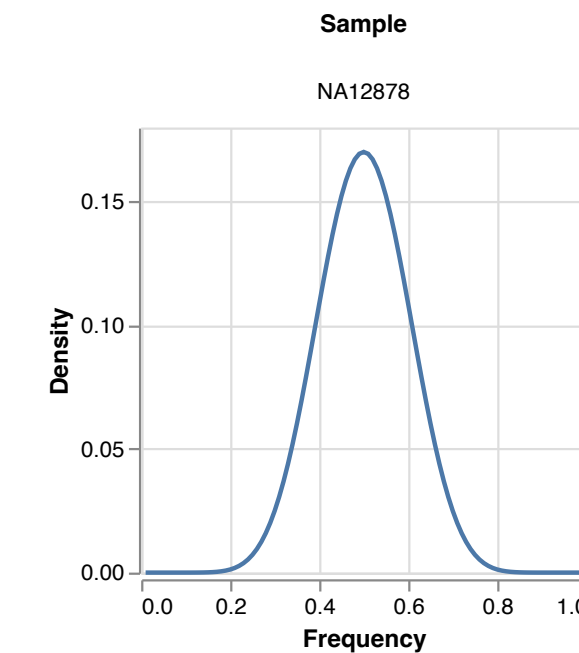
**...but is a single table enough?**

**Oncoprint + single variant calls**

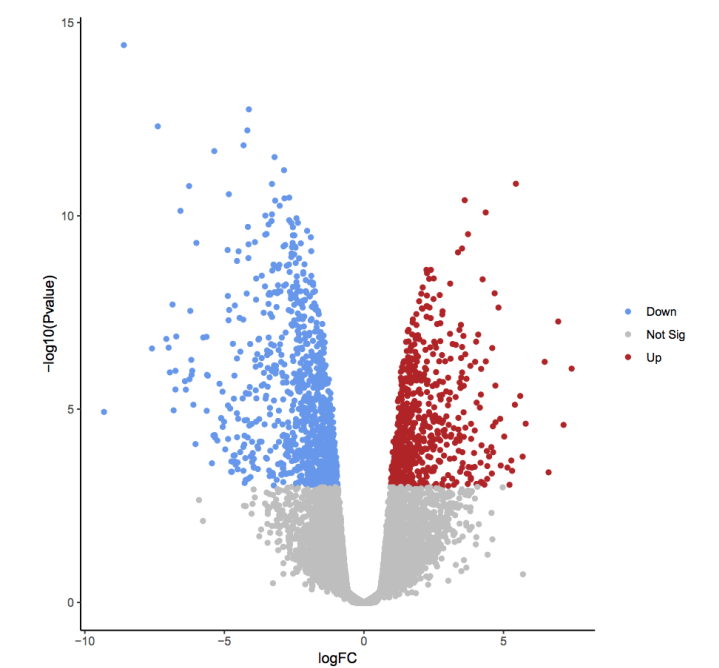
**Differentially expressed genes + expression matrix**

# ...but is a single table enough?

**Oncoprint + single variant calls +**



**Differentially expressed genes + expression matrix +**



# State of the art

## Individual tables (tsv, excel) and plots

- Easy to publish
- Limited interactivity
- Missing connections in between items of different tables

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## Web applications (Custom, Shiny, Lumen, ...)

- Run on (local) server
- Implementation overhead
- Long-term maintenance is challenging



# The problem

## **Input:**

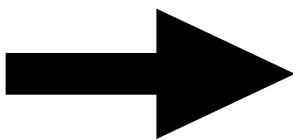
- Set of tables
- Relations between tables
- Set of rendering definitions

## **Output:**

- Portable and interactive representation

# Datavzrd

```
1  name: My oscar report
2  datasets:
3    oscars:
4      path: ".examples/data/oscars.csv"
5      offer-excel: true
6      links:
7        link to oscar plot:
8          column: age
9          view: oscar-plot
10       link to movie:
11         column: movie
12         table-row: movies/Title
13     movies:
14       path: ".examples/data/movies.csv"
15       offer-excel: true
16       links:
17         link to oscar entry:
18           column: Title
19           table-row: oscars/movie
20 default-view: oscars
21 webview-controls: true
22 views:
23   movies:
24     dataset: movies
25     render-table: ^
26     columns:
27       Genre:
28         ellipsis: 15
29       imdbID:
30         link-to-url:
31           IMDB:
32             url: "https://www.imdb.com/title/{value}/"
33       Title:
34         link-to-url:
35           Wikipedia:
36             url: "https://en.wikipedia.org/wiki/{value}"
37           Letterboxd:
38             url: "https://letterboxd.com/search/{value}"
39             new-window: false
40       imdbRating:
41         precision: 1
42         plot:
43           bars:
44             scale: linear
45             domain:
46               - 1
47               - 10
48             color:
49               scale: linear
50               range:
51                 - red
52                 - green
```



7th Heaven ▾	1927	Unrated	6 May 1927	1h 50m	Drama	Frank Borzage	7.6	tt0018379	link to oscar entry		
Coquette ▾	1929	Unrated	06 Apr 1929	1h 16m	Drama, Romance	Sam Taylor	5.7	tt0019788	link to oscar entry		
The Divorcee ▾	1930	Passed	19 Apr 1930	1h 24m	Romance, Drama	Robert Z. Leonard	6.7	tt0020827	link to oscar entry		
Min and Bill ▾	1930	Passed	29 Nov 1930	1h 9m	Comedy, Drama	George W. Hill	6.8	tt0021148	link to oscar entry		
The Sin of Madelon Claudet ▾	1931	Passed	24 Oct 1931	1h 15m	Drama	Edgar Selwyn	6.7	tt0022386	link to oscar entry		
Morning Glory ▾	2010	PG-13	10 Nov 2010	1h 47m	Comedy, Drama, ...	Roger Michell	6.5	tt1126618	link to oscar entry		
It Happened One Night ▾	1934	Passed	22 Feb 1934	1h 45m	Comedy, Romance	Frank Capra	8.1	tt0025316	link to oscar entry		
Dangerous ▾	2021	R	05 Nov 2021	1h 39m	Action, Thrille...	David Hackl	5.1	tt3876910	link to oscar entry		
The Great Ziegfeld ▾	1936	Passed	08 Apr 1936	2h 56m	Drama, Musical	Robert Z. Leonard	6.7	tt0027698	link to oscar entry		
The Good Earth ▾	1937	Passed	06 Aug 1937	2h 18m	Drama, Romance	Sidney Franklin, Victor Fleming, Gustav Machatý	7.5	tt0028944	link to oscar entry		
Jezebel ▾	1938	Approved	26 Mar 1938	1h 44m	Drama, Romance	William Wyler	7.5	tt0030287	link to oscar entry		
Gone with the Wind ▾	1939	Passed	17 Jan 1940	3h 58m	Drama, History,...	Victor Fleming, George Cukor, Sam Wood	8.1	tt0031381	link to oscar entry		
Kitty Foyle ▾	1940	Passed	27 Dec 1940	1h 48m	Drama, Romance	Sam Wood	6.9	tt0032671	link to oscar entry		
Suspicion ▾	1941	Approved	14 Nov 1941	1h 39m	Film-Noir, Myst...	Alfred Hitchcock	7.4	tt0034248	link to oscar entry		
Mrs. Miniver ▾	1942	Not Rated	01 Dec 1942	2h 14m	Drama, Romance,...	William Wyler	7.6	tt0035093	link to oscar entry		
The Song of Bernadette ▾	1943	Approved	01 Apr 1945	2h 36m	Biography, Dram...	Henry King	7.6	tt0036377	link to oscar entry		
Gaslight ▾	1944	Passed	30 Oct 1944	1h 54m	Crime, Drama, M...	George Cukor	7.8	tt0036855	link to oscar entry		
Mildred Pierce ▾	1945	Approved	20 Oct 1945	1h 51m	Crime, Drama, F...	Michael Curtiz	8.0	tt0037913	link to oscar entry		
To Each His Own ▾	1946	Approved	12 Mar 1946	2h 2m	Drama, Romance	Mitchell Leisen	7.7	tt0039040	link to oscar entry		
The Farmer's Daughter ▾	1947	Unrated	26 Mar 1947	1h 37m	Comedy, Drama, ...	H.C. Potter	7.2	tt0039370	link to oscar entry		

Showing 1 to 20 of 184 rows

20 rows per page

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1

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...

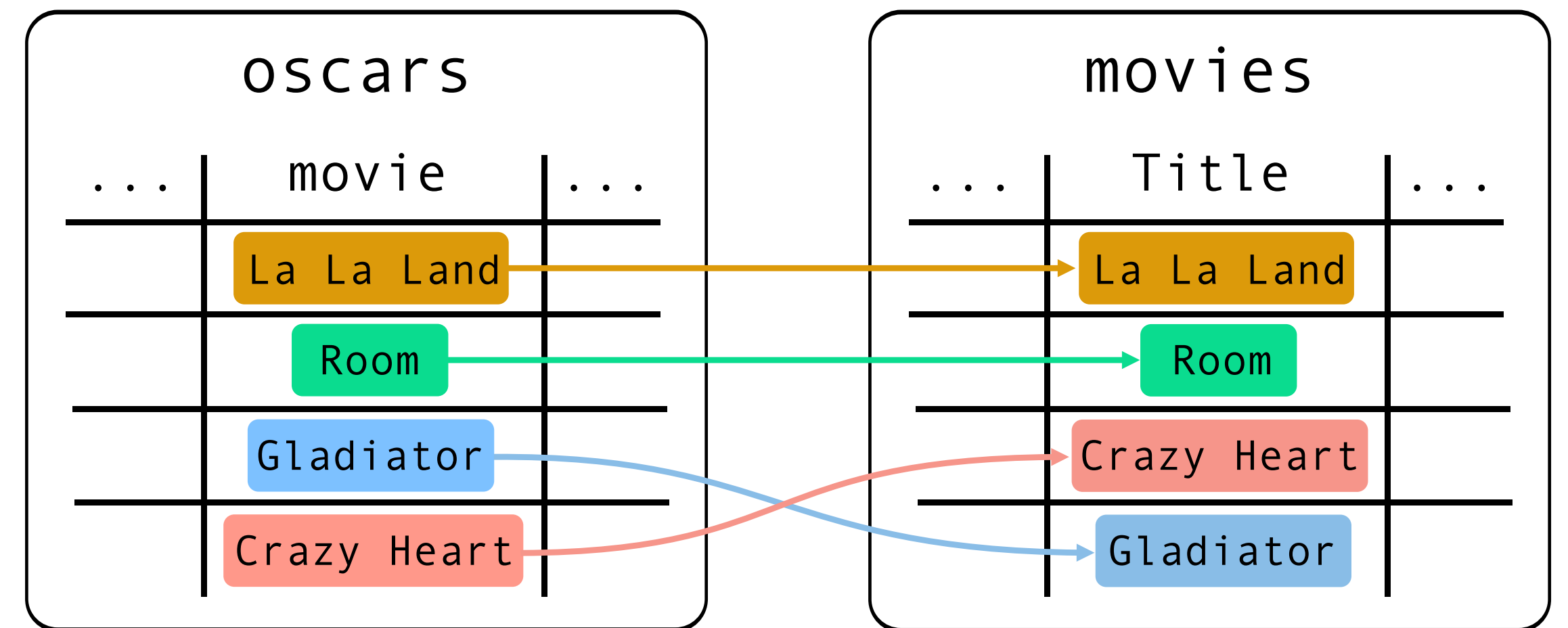
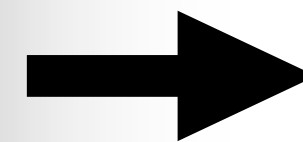
10

>

# Configuration

# Datasets

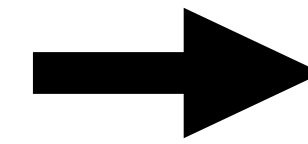
```
datasets:
  oscars:
    path: ".examples/data/oscars.csv"
    offer-excel: true
    links:
      link to movie:
        column: movie
        table-row: movies/Title
  movies:
    path: ".examples/data/movies.csv"
    offer-excel: true
    links:
      link to oscar entry:
        column: Title
        table-row: oscars/movie
```



# Tick Plots



```
age:
  plot:
    ticks:
      scale: linear
      domain:
        - 20
        - 100
```

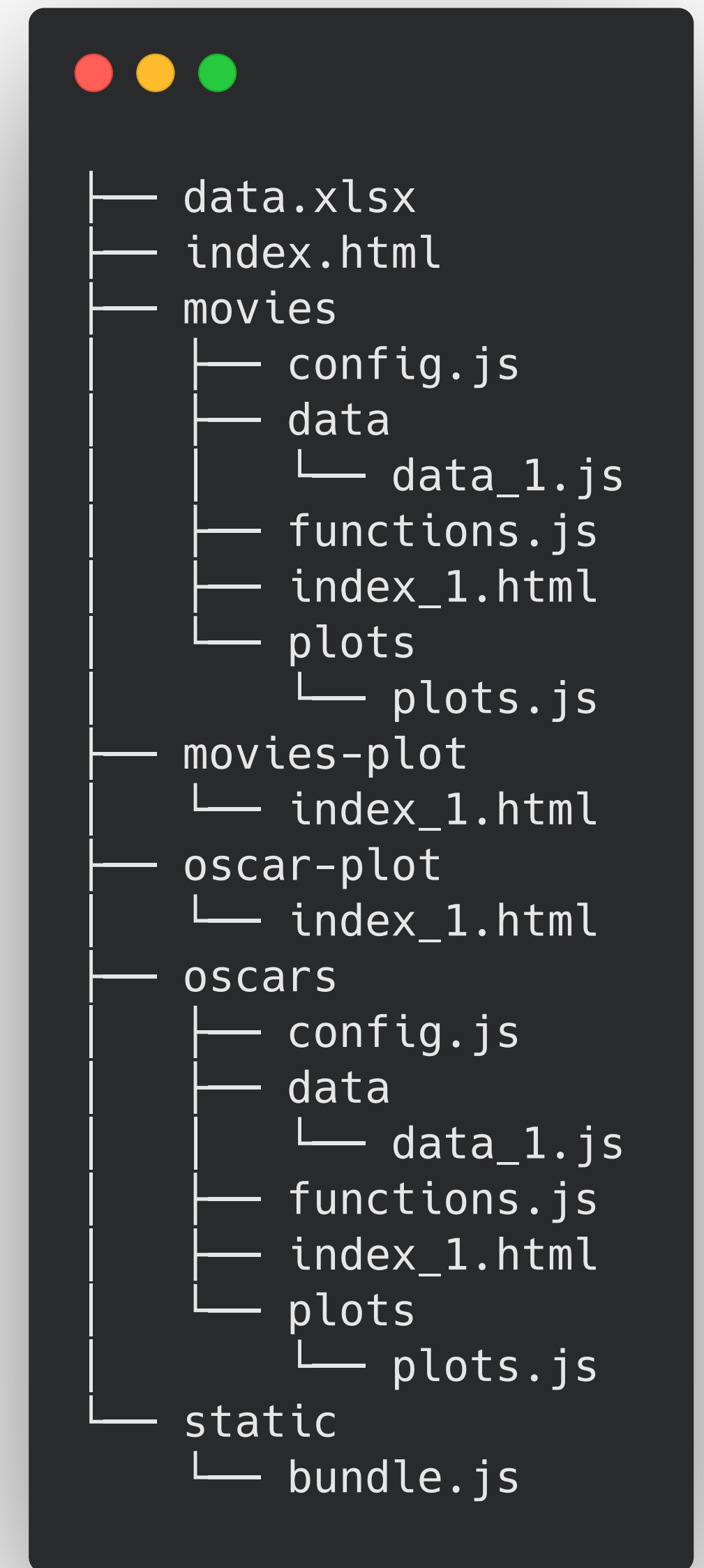


# More options:

- Bar plots
- Pill plots
- Linkouts
- Custom Plots using Vega-Lite
- Custom renderings using Javascript
- Reusable configurations created by the community: *spells*
- Infer base configuration from dataset using `datavzrd suggest`

# Portability

- Static HTML files in one directory
- No server needed
- Easily sharable
  - Zip directory and send via email, WeTransfer etc.
  - Attach to publication as supplement
  - Host report on GitHub pages using `datavzrd publish`





[datavzrd.github.io](https://datavzrd.github.io)



**Datavzrd: Rapid programming- and maintenance-free interactive visualization and communication of tabular data**

Felix Wiegand , David Lähnemann, Felix Mölder, Hamdiye Uzuner, Adrian Prinz, Alexander Schramm, Johannes Köster

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Koesterlab

