TECHNISCHE UNIVERSITÄT DRESDEN

Computergraphik und Visualisierung

INTERACTIVE MEDIA LAB DRESDEN

Faculty of Computer Science
Institute of Software and Multimedia Technology

2 Data Visualization – Course Work

Multivariate Visualizations

Course Work – Assignment 2
1 Interactive Scatterplot

Realize a simple visualization for multivariate data

- Create a scatterplot that encodes multiple data attributes at the same time
- Visually analyze the data regarding patterns, correlations, outliers, …

Car data set containing ~390 different models with different 13 attributes

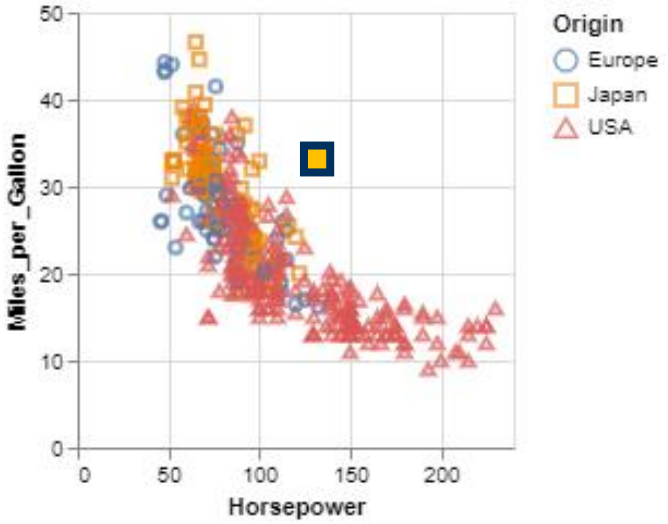
- Pick four attributes and think about how to encode them in a scatterplot

Name	Type	AWD	RWD	Retail Price	Dealer Cost	Engine Size (l)	Cyl	Horsepower(HP)	City Miles Per Gallon
Acura 3.5 RL 4dr	Sedan	0	0	43755	39014	3.5	6	225	18
Acura 3.5 RL w/Navigation 4dr	Sedan	0	0	46100	41100	3.5	6	225	18
Acura MDX	SUV	1	0	36945	33337	3.5	6	265	17
Acura NSX coupe 2dr manual S	Sports Car	0	1	89765	79978	3.2	6	290	17
Acura RSX Type S 2dr	Sedan	0	0	23820	21761	2	4	200	24
Acura TL 4dr	Sedan	0	0	33195	30299	3.2	6	270	20
Acura TSX 4dr	Sedan	0	0	26990	24647	2.4	4	200	22
Audi A4 1.8T 4dr	Sedan	0	0	25940	23508	1.8	4	170	22
Audi A4 3.0 4dr	Sedan	0	0	31840	28846	3	0	220	20
Audi A4 3.0 convertible 2dr	Sedan	0	0	42490	38325	3	6	220	20
Audi A4 3.0 Quattro 4dr auto	Sedan	1	0	34480	31388	0	6	220	18
Audi A4 3.0 Quattro 4dr manual	Sedan	1	0	33430	30366	3	6	220	17
Audi A4 3.0 Quattro convertible 2dr	Sedan	1	0	44240	40075	3	6	220	18
Audi A41.8T convertible 2dr	Sedan	0	0	35940	32506	1.8	4	170	23
Audi A6 2.7 Turbo Quattro 4dr	Sedan	1	0	42840	38840	2.7	6	250	18
Audi A6 3.0 4dr	Sedan	0	0	36640	33129	3	6	220	20
Audi A6 3.0 Avant Quattro	Wagon	1	0	40840	37060	3	6	220	18
Audi A6 3.0 Quattro 4dr	Sedan	1	0	39640	35992	3	6	220	18
Audi A6 4.2 Quattro 4dr	Sedan	1	0	49690	44936	4.2	8	300	17
Audi A8 L Quattro 4dr	Sedan	1	0	69190	64740	4.2	8	330	17
Audi RS 6 4dr	Sports Car	0	0	84600	76417	4.2	8	450	15
Audi S4 Avant Quattro	Wagon	1	0	49090	44446	4.2	8	340	15
Audi S4 Quattro 4dr	Sedan	1	0	48040	43556	4.2	8	340	14
Audi TT 1.8 convertible 2dr (coupe)	Sports Car	0	0	35940	32512	1.8	4	180	20
Audi TT 1.8 Quattro 2dr (convertible)	Sports Car	1	0	37390	33891	1.8	4	225	20
Audi TT 3.2 coupe 2dr (convertible)	Sports Car	1	0	40590	36739	3.2	6	250	21
BMW 325Ci 2dr	Sedan	0	1	30795	28245	2.5	6	184	20
BMW 325Ci convertible 2dr	Sedan	0	1	37995	34800	2.5	6	184	19
BMW 325i 4dr	Sedan	0	1	28495	26155	2.5	6	184	20
BMW 325xi 4dr	Sedan	1	0	30245	27745	2.5	6	184	19
BMW 325xi Sport	Wagon	1	0	32845	30110	2.5	6	184	19
BMW 330Ci 2dr	Sedan	0	1	36995	33890	3	6	225	20
BMW 330Ci convertible 2dr	Sedan	0	1	44295	40530	3	6	225	19
BMW 330i 4dr	Sedan	0	1	35495	32525	3	6	225	20
BMW 330xi 4dr	Sedan	1	0	37245	34115	3	6	225	20
BMW 525i 4dr	Sedan	0	1	39995	36620	2.5	6	184	19
BMW 530i 4dr	Sedan	0	1	44995	41170	3	6	225	20
BMW 545iA 4dr	Sedan	0	1	54995	50270	4.4	8	325	18
BMW 745i 4dr	Sedan	0	1	69195	63190	4.4	8	325	18
BMW 745Li 4dr	Sedan	0	1	73195	66830	4.4	8	325	18
BMW M3 convertible 2dr	Sports Car	0	1	56595	51815	3.2	6	333	16

Course Work – Assignment 2
1 Interactive Scatterplot

Implement the scatterplot visualization!

- Implement the scatterplot using the D3js library
- Include axes labels and a legend

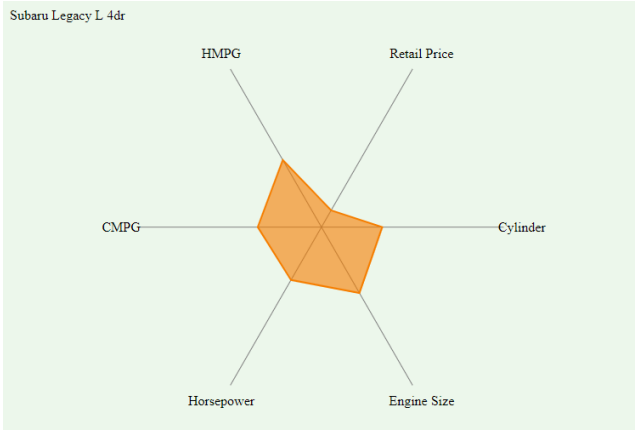


Allow selection of a single data point!

- Selecting of dots in the scatterplot
- For selection, detailed information of six attributes are shown below / on the right

- Bonus: Encode the six attributes as a starplot!

Name	Acura TL 4dr
Type	Sedan
AWD	0
RWD	0
Retail Price	33195
Dealer Cost	30299
Engine Size	3,50



Course Work – Assignment 2
1 Interactive Scatterplot

Further Instructions:

Create a fork of this repository using your favorite git service. The dataset and some very bare-bones files are already there.

I recommend and will use *Github*, since we will create a *Github Pages* site from this assignment. Here is an article explaining how to set up your Github Pages site. It is just a few clicks of work.

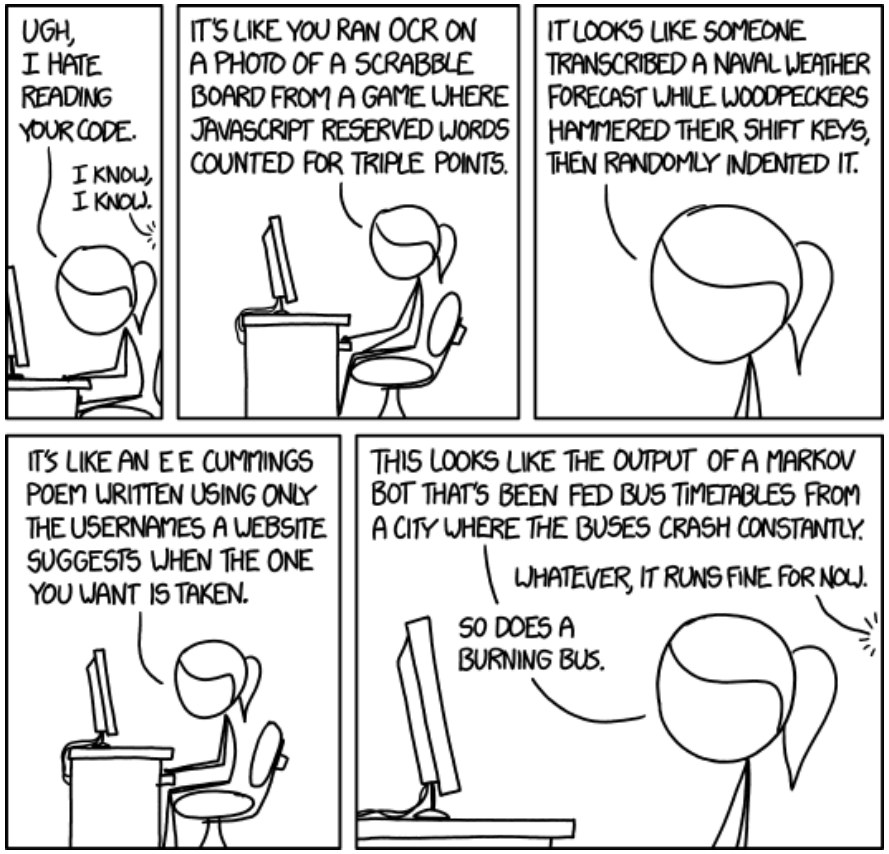
If you have any data or privacy concerns, remember: you can use your own version management system or submit the source code directly to OPAL!

Note: in the past, we used Glitch.com. However, this service has stopped hosting apps.
You may also use a similar service: JSBin, JSfiddle, Codepen, StackBlitz…

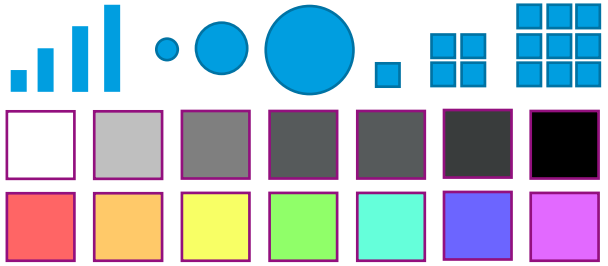
Course Work – Assignment 2
1 Interactive Scatterplot

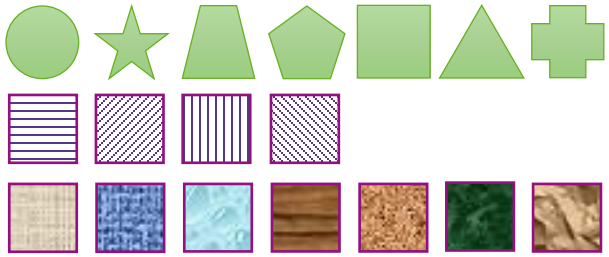
Additional Hints

- Use comments and document your code!
- It's okay to build upon existing examples, but: name your sources!
- Feel free to play around with D3, add further interactions, try out different encodings! :)



https://xkcd.com/1695/

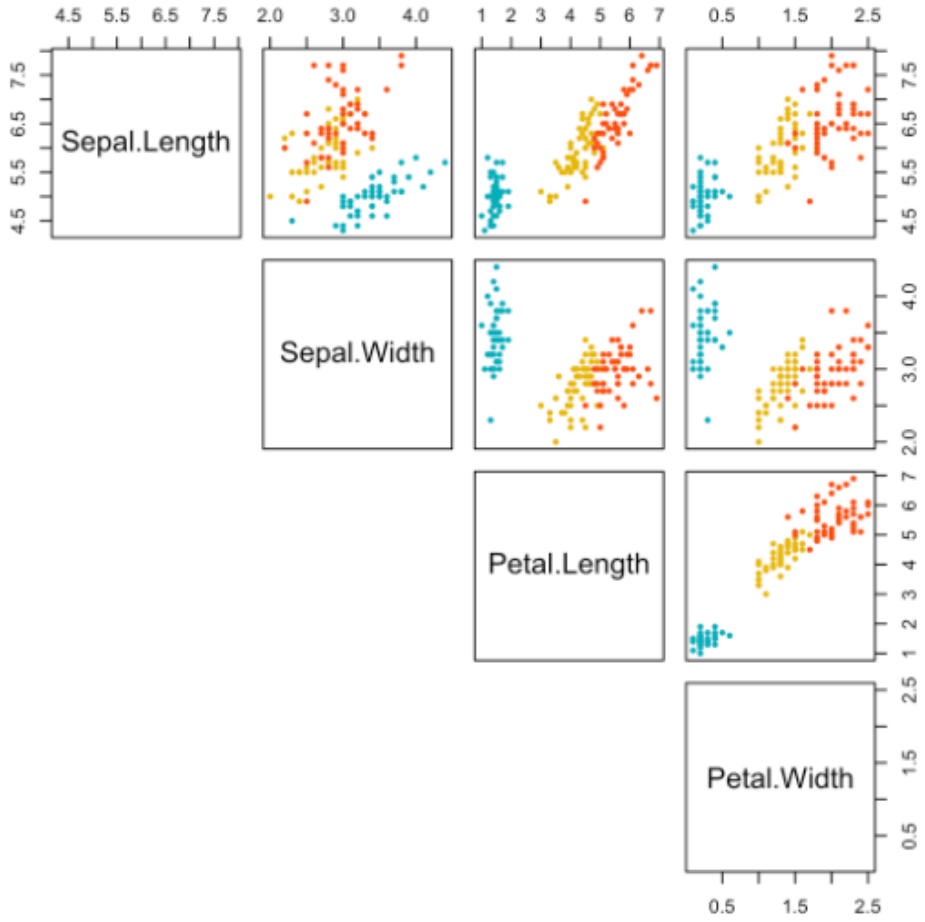




Course Work – Assignment 2
2 Lecture Recap

Let's talk about the Scatterplot Matrix!

- Describe the main principle of a scatterplot matrix!
- How many scatterplots for *n* attributes?
- Sketch an example for the cars data set (with 3 selected cars).
- Discuss advantages and disadvantages!



http://www.sthda.com/english/wiki/scatter-plot-matrices-r-base-graphs

Course Work – Assignment 2
Submission

Teamwork:

- Feel free to form groups of ~3 people to work on this. You can also work individually
- Prioritize interdisciplinary work!

AI tools:

- Feel free to seek assistance from AI systems
- Acknowledge any tools you used and please write a bit about your experience using them!

Submission of all files to OPAL:

- Adapt the README of your repository to show who worked on the project!
- TXT file with your answers to the questions, including a link to your repository.
- JPEG/PNG of your scatterplot matrix sketch
- 1-min video explaining your visual variables as MP4 (1080p, H.264, <50MB)