Data visualization

COSC 480B

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Lecture 1

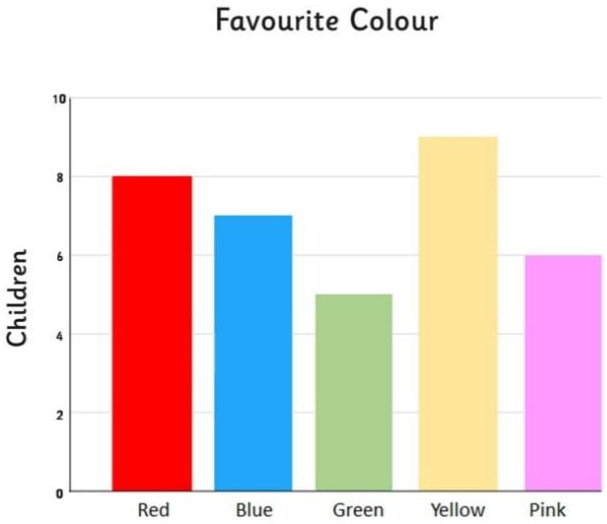
Overview + projects

Logistics

- Email me if you have any questions: rahmed1@colgate.edu
- Course schedule: Monday/Wednesday 14:45-16:00
- Office hours: Monday/Wednesday 16:00-17:00
- Email me if you need extra office hours
- Instructor room no.: 313A
- Teaching assistant: Lily Davisson
- Office hours: Wednesday 10 am - 12 pm and Friday 1 pm - 3 pm
- TA room: computer science lounge/zoom call

Data visualization

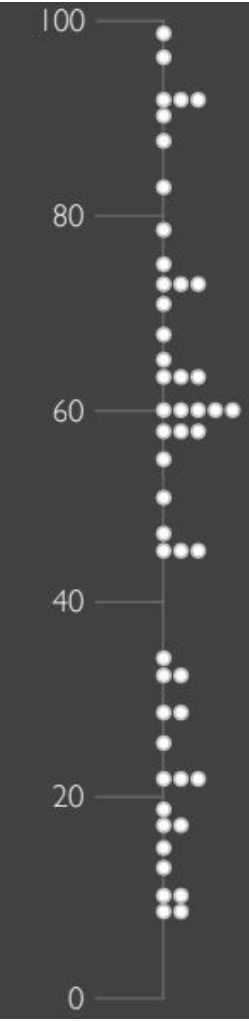
- Graphical representation of information and data
  - Charts
  - Graphs
  - Maps



15	19	60
33	11	75
57	34	79
18	51	92
73	22	13
71	60	22
17	10	68
73	18	55
65	46	29
60	73	22
46	92	97
10	58	46
57	17	83
26	99	33
88	92	60
91	29	57
96	12	47

given these 50 numbers . . .

. . . what number appears most often?



given these 50 numbers . . .

. . . what number appears most often?

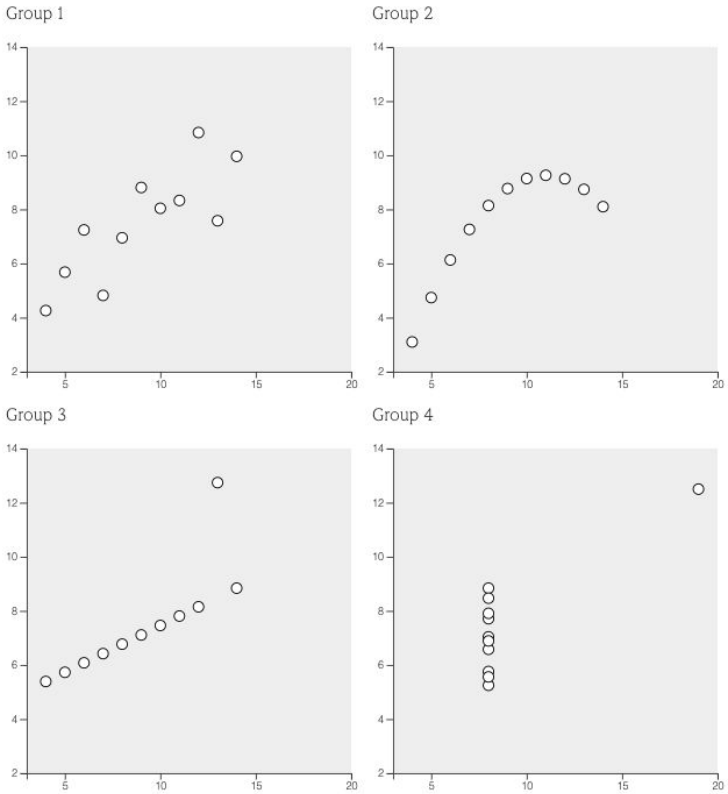
Anscombe’s quartet

X1	Y1	X2	Y2	X3	Y3	X4	Y4
10.0	8.04	10.0	9.14	10.0	7.46	8.0	6.58
8.0	6.95	8.0	8.14	8.0	6.77	8.0	5.76
13.0	7.58	13.0	8.74	13.0	12.74	8.0	7.71
9.0	8.81	9.0	8.77	9.0	7.11	8.0	8.84
11.0	8.33	11.0	9.26	11.0	7.81	8.0	8.47
14.0	9.96	14.0	8.10	14.0	8.84	8.0	7.04
6.0	7.24	6.0	6.13	6.0	6.08	8.0	5.25
4.0	4.26	4.0	3.10	4.0	5.39	19.0	12.50
12.0	10.84	12.0	9.13	12.0	8.15	8.0	5.56
7.0	4.82	7.0	7.26	7.0	6.42	8.0	7.91
5.0	5.68	5.0	4.74	5.0	5.73	8.0	6.89

Anscombe’s quartet

group	x mean	y mean	x median	y median	x variance	y variance	correlation
1	9.00	7.50	9.00	7.58	11.00	11.00	0.45
2	9.00	7.50	9.00	8.14	11.00	11.00	0.45
3	9.00	7.50	9.00	7.11	11.00	11.00	0.45
4	9.00	7.50	8.00	7.04	11.00	11.00	0.45

Anscombe’s quartet

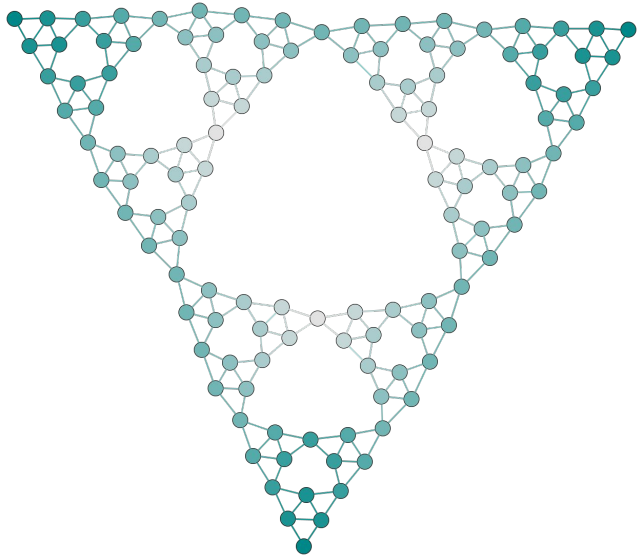


Assignment 1

- Project proposal
- Briefly describe the project
  - An introduction: definitions and motivations
  - A list of task
- Pick one of the following topic:
  - Force-directed algorithm
  - Stress optimization
  - Using map to visualize networks
  - Application of neural networks
  - Dynamic network visualization
- Email me if you have any questions
- Due: 5:00PM, Friday September 10 2021

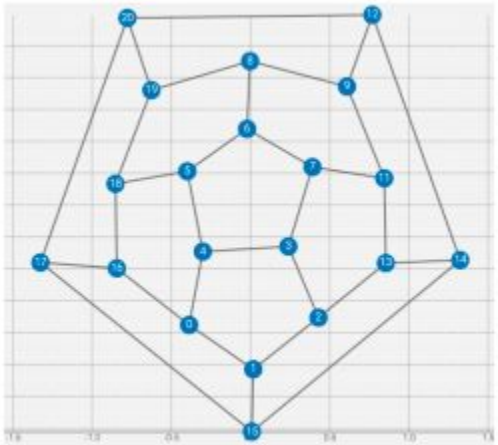
Projects

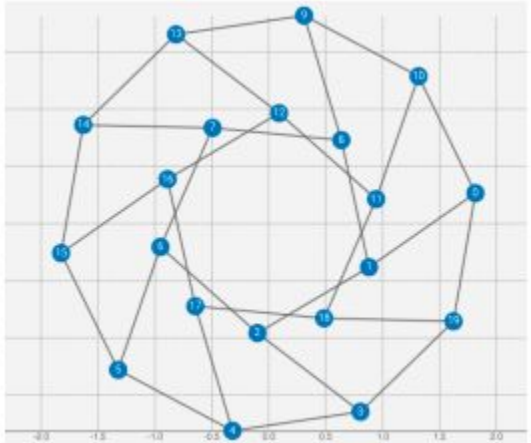
- Force-directed algorithm
  - Example: http://cgi.cs.arizona.edu/~abureyanahmed/gd2017/tutte.html
  - Paper: https://tiga1231.github.io/zmlt/demo/doc/paper.pdf

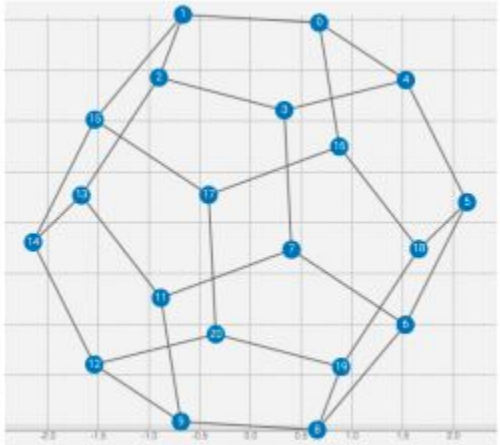


Projects

- Stress optimization
  - Example: http://hdc.cs.arizona.edu/~mwli/graph-drawing/
  - Paper: https://arxiv.org/pdf/2008.05584.pdf





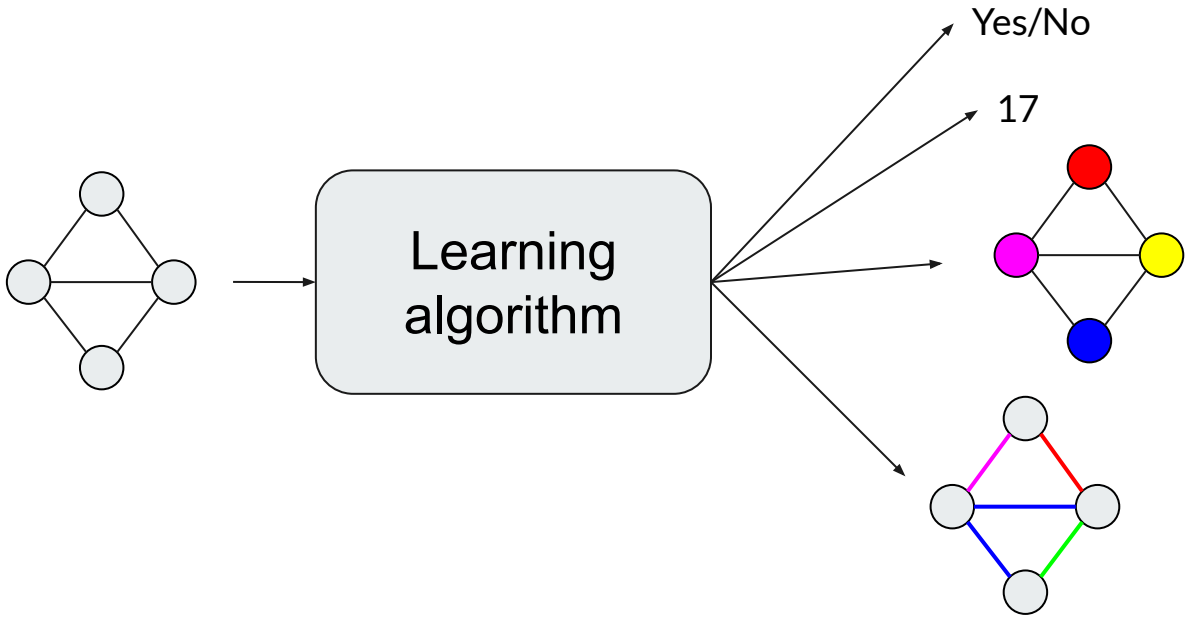


Projects

- Using map to visualize networks
  - Example: https://tiga1231.github.io/zmlt/demo/overview.html
  - Paper: http://www2.cs.arizona.edu/~kobourov/pacvis10.pdf

Projects

- Application of neural networks
  - Paper: https://arxiv.org/pdf/1907.01004.pdf



Projects

- Dynamic network visualization
  - Example: https://ryngray.github.io/dynamic-trees/
  - Paper: https://arxiv.org/pdf/2106.08843.pdf