Visual Display of Quantitative Information

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(Thanks to Andy Cockburn)

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Why?

- ☆ Explore data
- ☆ Reveal information in data (distribution, relationships, ...
- ☆ Make a point
- ☆ Illustrate an idea
- ☆ Give an example
- ☆ Condense information
- ☆ Provide interest
- ☆ ...
- ✔ $>$ 1 of the above

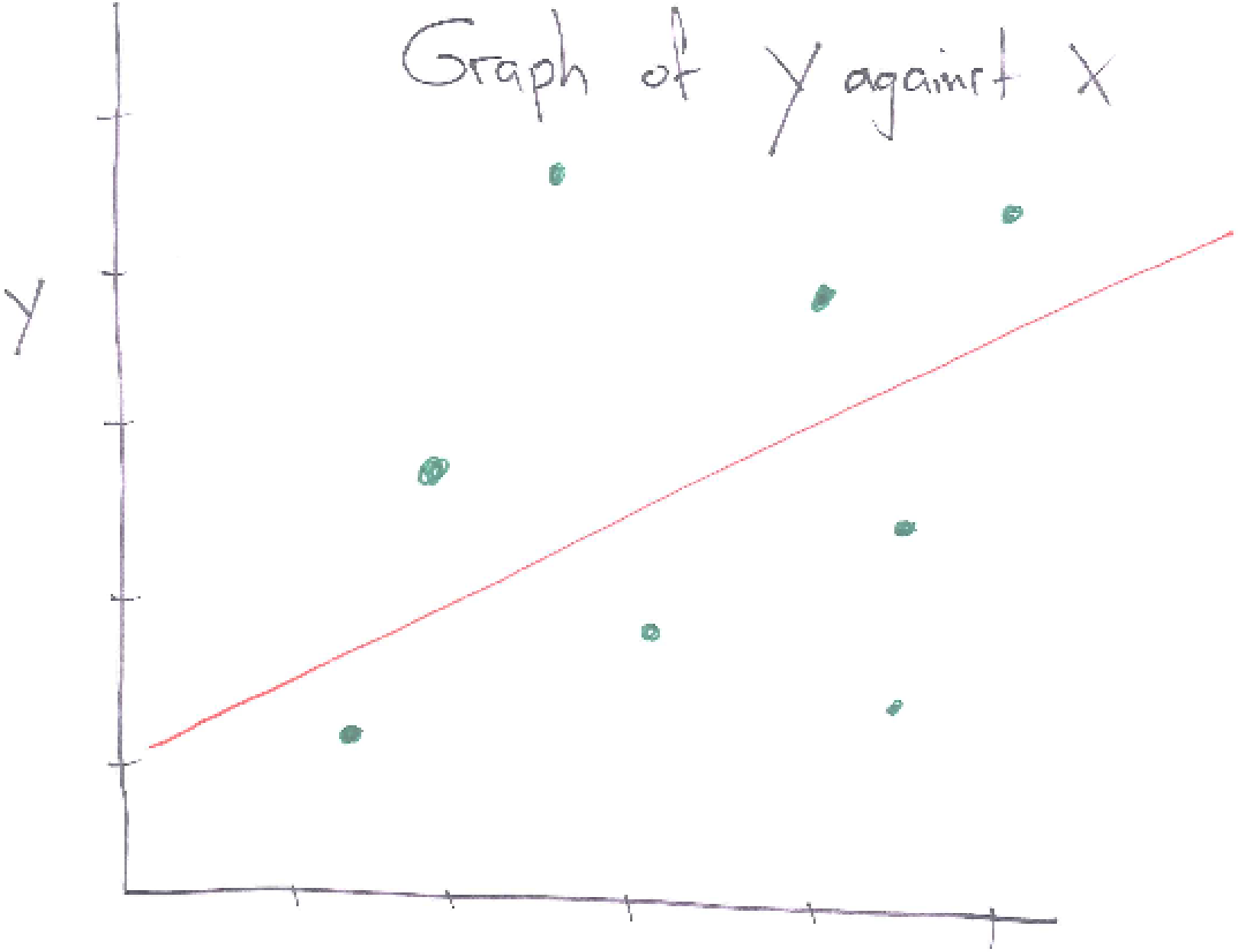
Metadata & Meta-considerations

- ☆ Sources
- ☆ Highlight original contributions, cite sources
- ☆ Integration with text
- ☆ Experimental conditions (equipment, subjects, settings, parameters, . . .)
- ☆ Spell check
- ☆ . . .

Considerations

- ☆ Big picture (focus + context)
- ☆ Size
- ☆ Location
- ☆ Title, caption
- ☆ Uncertainties
- ☆ Origin
- ☆ Scale
- ☆ Outliers
- ☆ Labels
- ☆ Significant figures
- ☆ Artifacts (avoid bitmaps, . . .)
- ☆ Avoid misleading

Example



Example

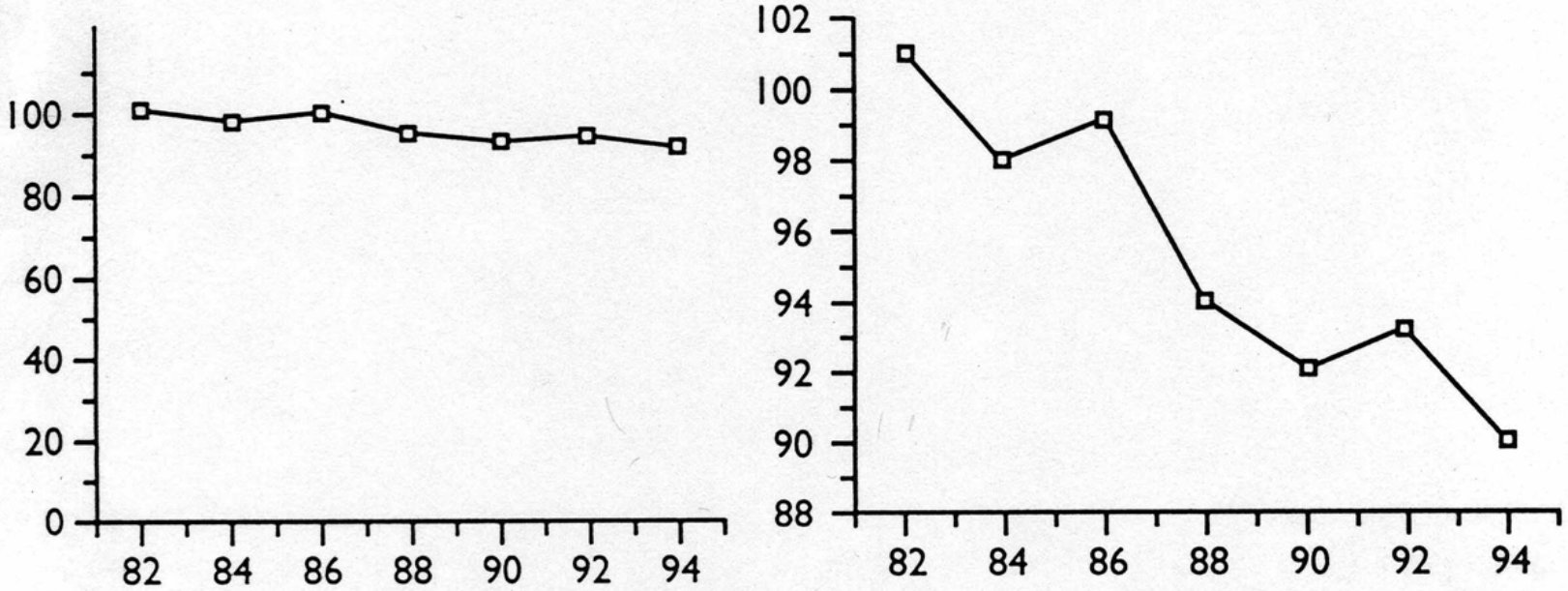
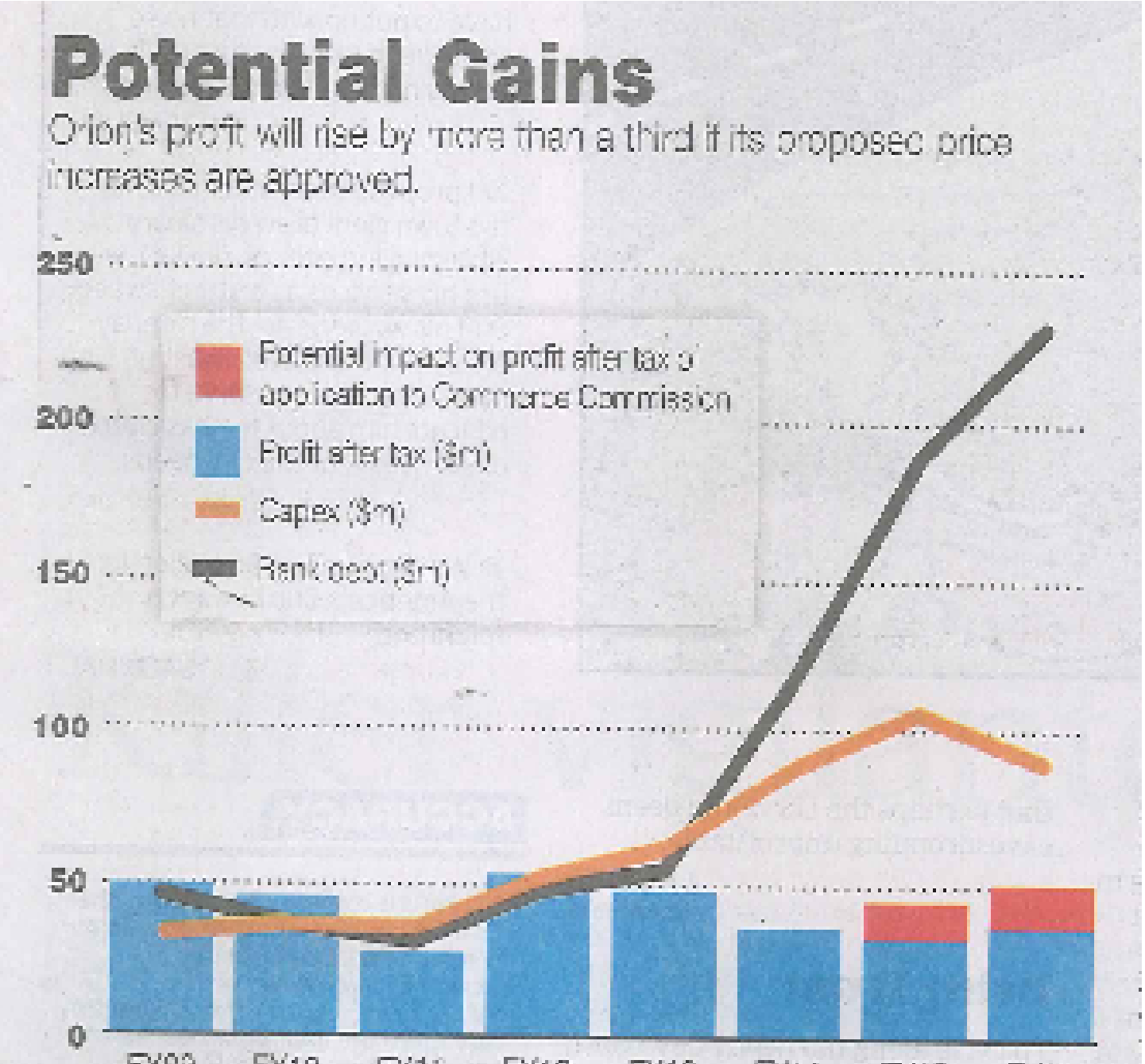


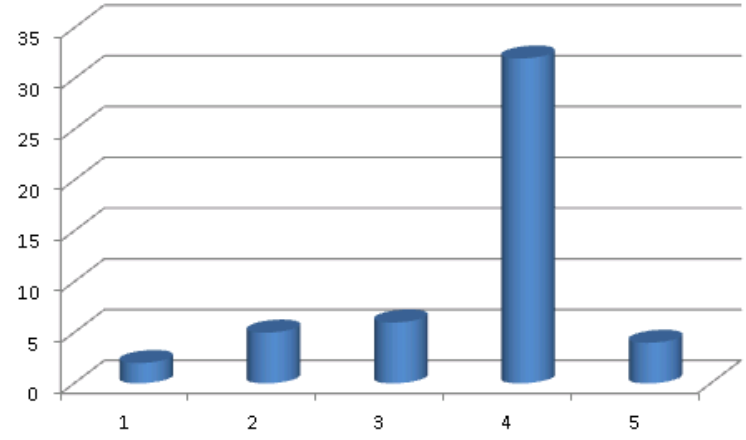
Figure 12.21: Capital City Pollution Index, 1982–1994 (July averages)

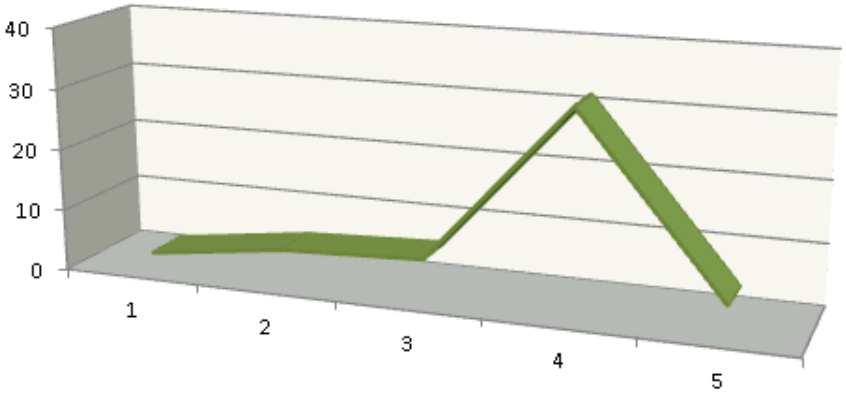
Example


Potential Gains
Orion's profit will rise by more than a third if its proposed price increases are approved.
250
200
150
100
50
0
Potential impact on profit after tax of application to Commerce Commission
Profit after tax ($m)
Capex ($m)
Bank debt ($m)

Example

Example





Foo
2
5
6
32
4

Tables

- ☆ Good for showing exact (numeric) values
- ☆ Multiple local comparisons practicable
- ☆ Supplement text explanation
- ☆ Not so good for trends
- ☆ Left-justify text
- ☆ Right-justify numbers (align decimal points)
- ☆ Significant figures

- ☆ Avoid data prisons (too many grid bars)
- ☆ Unnecessary for few data values—minimum viable size?

Example

How Different Groups Voted for President

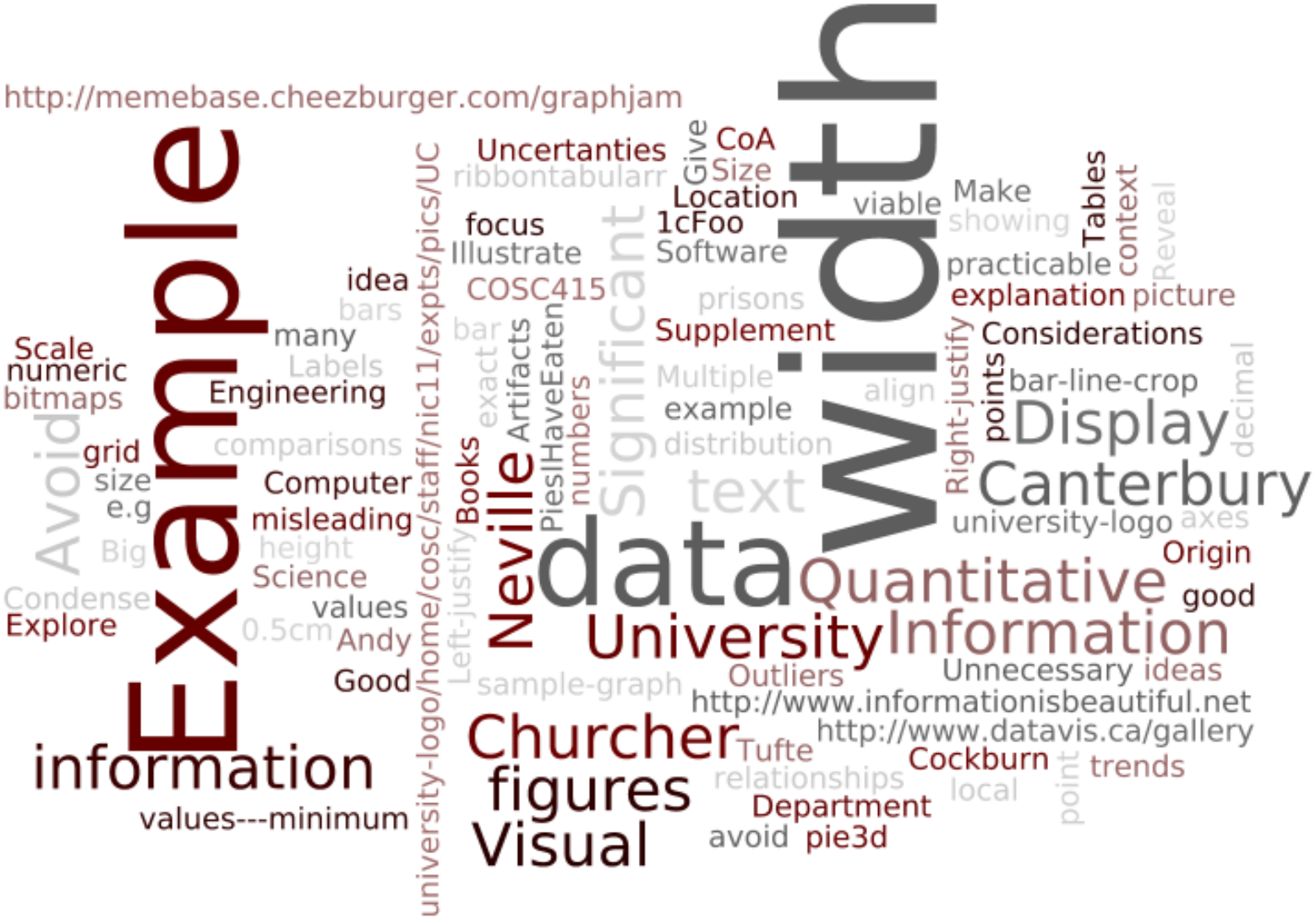
Based on 12,782 interviews with voters at their polling places. Shown is how each group divided its vote for President and, in parentheses, the percentage of the electorate belonging to each group.

	CARTER	REAGAN	ANDERSON	CARTER-FORD in 1976
Democrats (43%)	66	26	6	77 - 22
Independents (23%)	30	54	12	43 - 54
Republicans (28%)	11	84	4	9 - 90
Liberals (17%)	57	27	11	70 - 26
Moderates (46%)	42	48	8	51 - 48
Conservatives (28%)	23	71	4	29 - 70
Liberal Democrats (9%)	70	14	13	86 - 12
Moderate Democrats (22%)	66	28	6	77 - 22
Conservative Democrats (8%)	53	41	4	64 - 35
Politically active Democrats (3%)	72	19	8	—
Democrats favoring Kennedy in primaries (13%)	66	24	8	—
Liberal Independents (4%)	50	29	15	64 - 29
Moderate Independents (12%)	31	53	13	45 - 53
Conservative Independents (7%)	22	69	6	26 - 72
Liberal Republicans (2%)	25	66	9	17 - 82
Moderate Republicans (11%)	13	81	5	11 - 88
Conservative Republicans (12%)	6	91	2	6 - 93
Politically active Republicans (2%)	5	89	6	—
East (32%)	43	47	8	51 - 47
South (27%)	44	51	3	54 - 45
Midwest (20%)	41	51	6	48 - 50
West (11%)	35	52	10	46 - 51

For further ideas . . .

- ☆ Books by Tufte e.g. *The Visual Display of Quantitative Information*
- ☆ `http://www.datavis.ca/gallery`
- ☆ `http://www.informationisbeautiful.net`
- ☆ `http://memebase.cheezburger.com/graphjam`
- ☆ COSC415
- ☆ . . .

Summary


http://memebase.cheezburger.com/graphjam
Example
width
data
Quantitative
Information
University
Neville
Churcher
figures
Visual
information
Display
Canterbury
Significant
text
Avoid
Uncertanties
ribbontabularr
Give
CoA
Size
Location
1cFoo
Software
focus
Illustrate
COSC415
idea
bars
many
Labels
Engineering
comparisons
Computer
misleading
height
Science
values
0.5cm
Andy
Good
Scale
numeric
bitmaps
grid
size
e.g
Big
Condense
Explore
values---minimum
university-logo/home/cosc/staff/nic11/expts/pics/UC
Left-justify
Books
exact
bar
Artifacts
PieslHaveEaten
numbers
prisons
Supplement
Multiple
example
distribution
sample-graph
Outliers
viable
Make
showing
Tables
context
Reveal
practicable
explanation
picture
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points
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Tufte
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point
Department
avoid
pie3d