Fundamentals of Data Science

Data Visualisation

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Storytelling

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Storytelling

"The conveying of events in words, sound and/or images, often by improvisation or embellishment."
(Wikipedia)

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Storytelling with data visualisation

Recall that the aim of visualisation is to effectively convey some information from data.

You want decision makers to be able to see the **results** of your analysis.

- These should be conveyed in a manner that is suitable for the intended audience to understand.

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Considerations for the story

Who are your audience?

- Prior knowledge? Time available?

What is the story?

- What does the data show? What is the **result**?
- Why do you want people to look at your visualisation?
- Common technique in journalism is to “simplify, then exaggerate”.

What do you want people to *do* after seeing your visualisation?

- How do you want their behaviour to change?

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Author- or reader-driven?

- The type of story will determine the type of visualisation you need to create.
- An author-driven story has a linear ordering, which you walk the reader through, with little or no interactivity.
- For reader-driven stories, there is no prescribed ordering to the content, allowing the reader to interact and find their own story.

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Balancing author- and reader-driven stories

As a compromise between the two approaches, we can merge them both

1. Initial author-driven sequence, that opens up into an interactive narrative for exploration.
2. Author-driven sequence with interaction allowed ‘mid-narrative’ – user can explore a particular point more before moving ahead.
3. General theme presented allowing reader-driven interaction, but they can then choose particular elements to reveal additional author-driven details.

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Communicating your message

Highlight and emphasise

- The important information is key to the story, so it should be seen clearly without distractions
- Remove chart junk! Increase data:ink ratio.

Organise

- Using knowledge about gestalt theory and visual perception, information should be structured to guide readers through in a way that will produce the most understanding.

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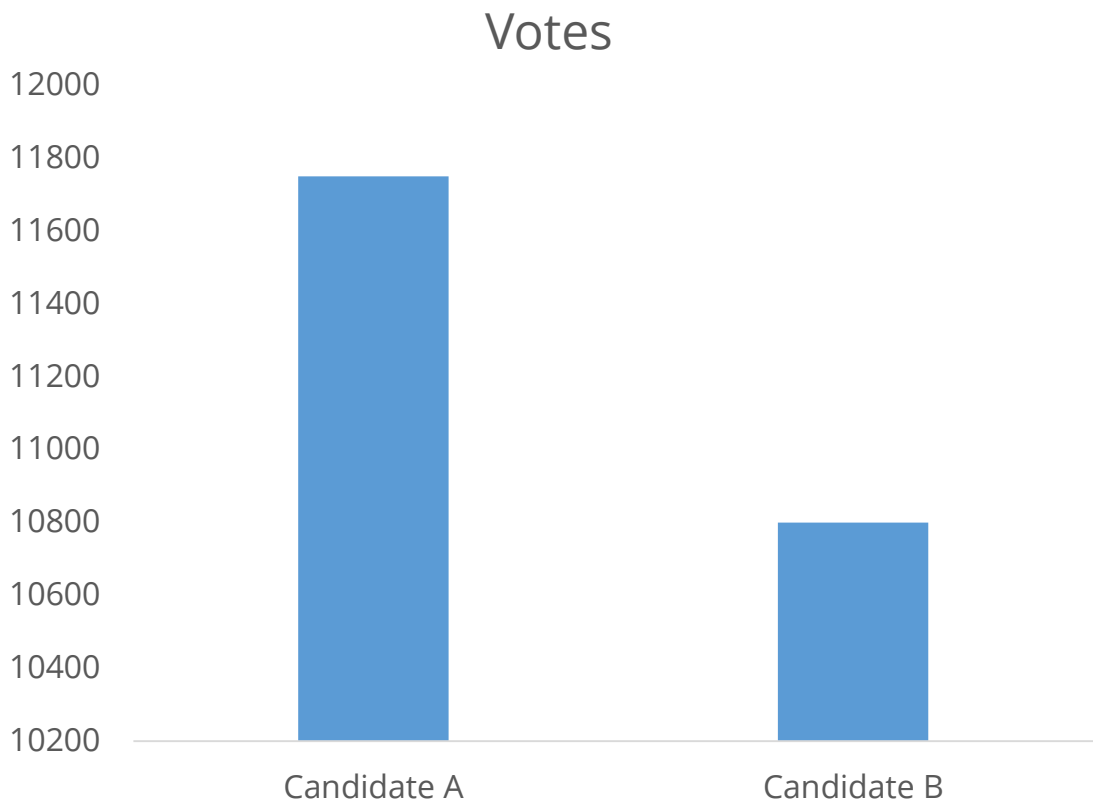
Be objective

- Tufte created a formula to calculate the ‘lie factor’ or how ‘misleading’ a graphic is
- Lie factor = $EffectSizeInGraphic / EffectSizeInData$
  - where EffectSize = $(value2 - value1) / value1$
- a reliable graphic should be between 0.95 and 1.05.

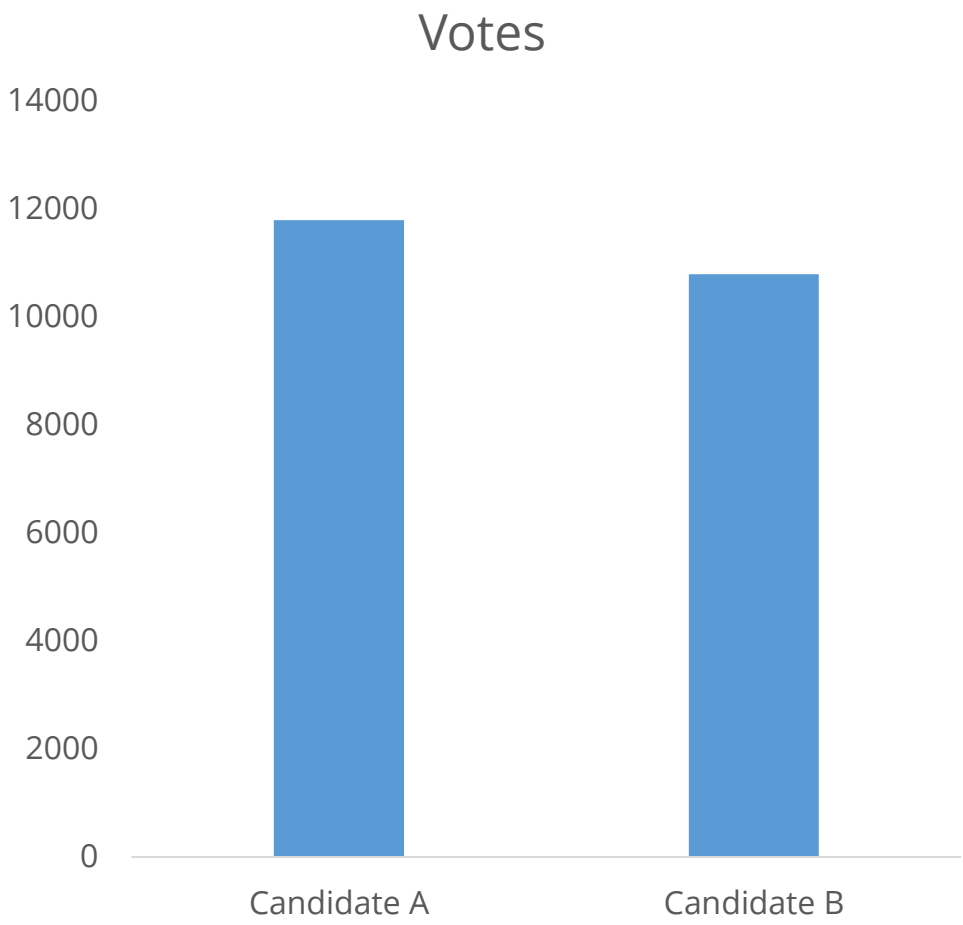
Lie Factor

This suggests that **A** received around three times as many votes as **B**.



Lie Factor

In reality, things are much closer.



Summary

Decision makers need to see the results of your analysis

- And understand the ‘why’ and ‘so what’ as quickly as possible

You need to understand the data and present it in an appropriate way

- Consider theories around visual perception and make it easy for viewers to spot the important message in your image

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