

## Data Science, 2022

### Tut 8: Information Visualization

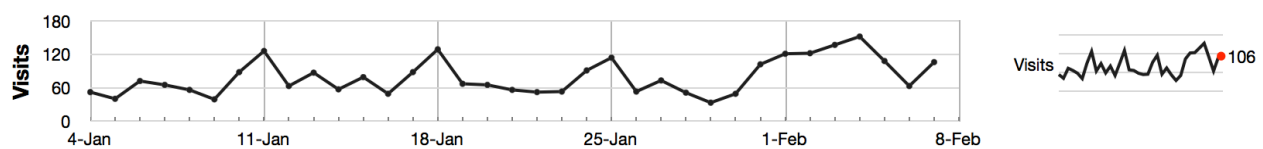
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#### Question 1

The data shown here are the number of visits to a university website for a particular statistics course. There are 90 students in the class.



1. What are the names (type) of the 2 plots shown?

Ans:

The plots are a time-series plot and a sparkline. The sparkline shows exactly the same data, just a more compact form (without the labelling on the axes).

2. List any 2 interesting features in these data.

Ans:

- 1) A sustained, high level of traffic in the first week February - maybe a midterm test.
- 2) Some days have more than 90 visits, indicating that students visit the site more than once per day, or due to external visitors to the site.

#### Question 2

What are the names of the axes on a bar plot?

Ans:

The category axis and value axis.

### Question 3

Which types of features can the human eye easily pick out of a time series plot?

Ans:

Features such as sinusoids, spikes, gaps (missing values), upward and downward trends are quickly picked out by the human eye.

### Question 4

Why is the principle of minimizing “data ink” so important in an effective visualization? Give an scientific or engineering example of why this important.

Ans:

It reduces the time or work to interpret that plot, by eliminating elements that are non-essential to the plot’s interpretation. Situations which are time or safety critical are examples, for example in an operator control room, or medical facility (operating room).

### Question 5

Describe what the main difference(s) between a bar chart and a histogram are.

1)Histograms are used to show distributions of variables while bar charts are used to compare variables.

2)Histograms plot quantitative data with ranges of the data grouped into bins or intervals while bar charts plot categorical data.

3)Bars can be reordered in bar charts but not in histograms.

4)There are no spaces between the bars of a histogram since there are no gaps between the bins. An exception would occur if there were no values in a given bin but in that case the value is zero rather than a space. On the other hand, there are spaces between the variables of a bar chart.