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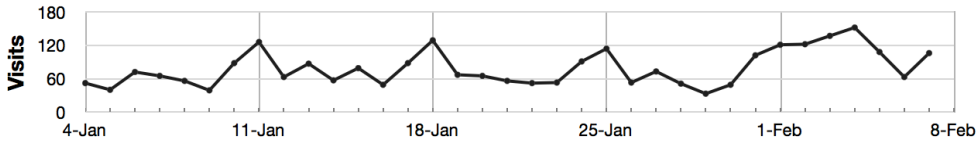
Data Science, 2022
Tut 8: Information Visualization

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. Plot 1 is Time Series plot

Plot 2 is Sparkline plot. The sparkline shows exactly the same data, just a more compact form (without the labeling on the axes).

2. List any 2 interesting features in this data.

Ans. 1. The number of visits is highest in the month of February particularly in its first week possibly due to midterm tests.

2. Though the number of students is 90, the number of visits is not 90. This indicates that there are more than one visits to the site may be due to external visits.

3. A noticeable weekly cycle; probably assignments are due the next day!

Question 2

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

Ans. The X-axis represents the category axis and Y-axis represents the value axis. it may be vice-versa for a horizontal 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, even in a poorly drawn plot.

Question 4

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

Ans.

Bar Chart	Histogram
1. Used to compare variables	1. Used to show distributions of variables
2. Plot categorical data.	2. Plot quantitative data with ranges of the data grouped into bins or intervals
3. Bars can be reordered in bar charts	3. Histograms cannot
4. There are spaces between the variables of a bar chart.	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.
5. The bars of bar charts typically have the same width. Therefore, values in bar charts are given by the length of the bar	5. The widths of the bars in a histogram need not be the same as long as the total area is one hundred percent if percentages are used or the total count if counts are used. Therefore, values in histograms are given by areas.