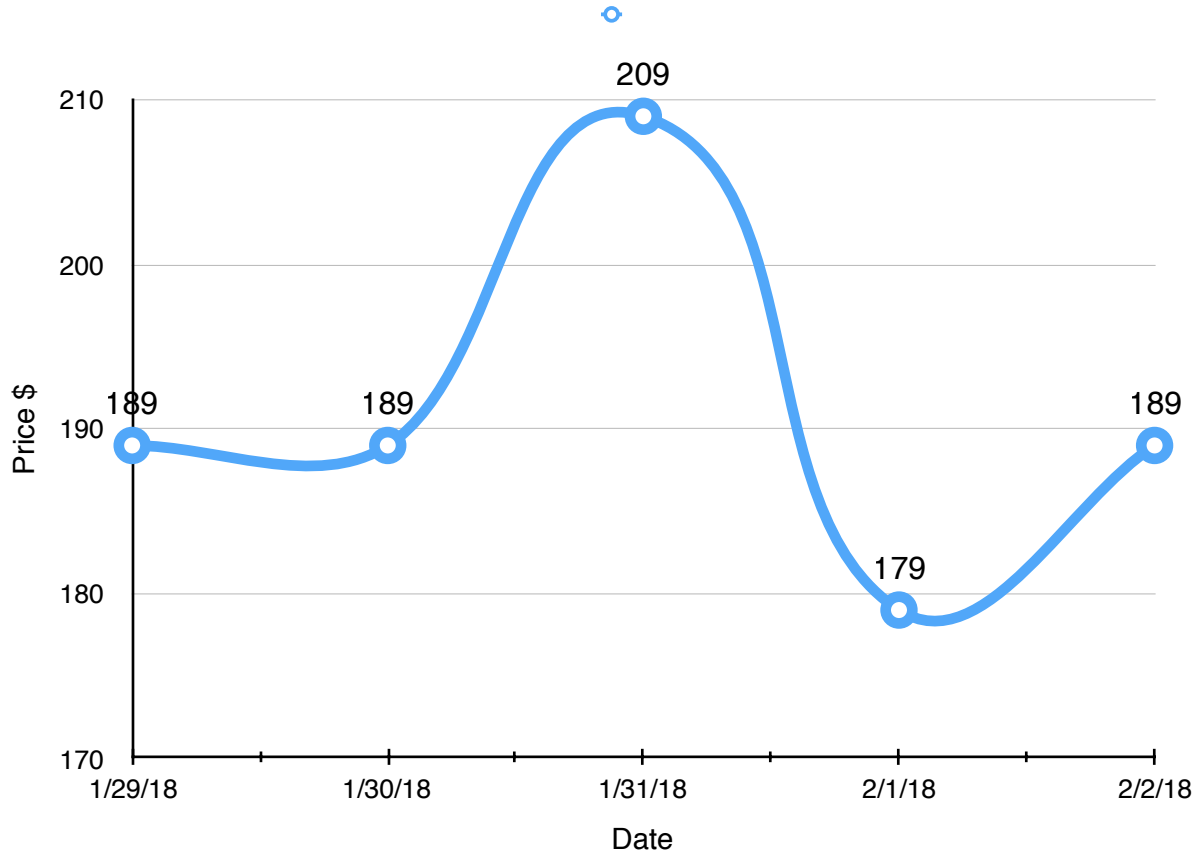
Quiz 1

1) Describe expressiveness principle for visualization? Then use an example visualization idiom to explain its expressiveness. (One page max)

The expressiveness principle for visualization states that the visualization (visual encoding) should express strictly only the information included in the referenced dataset. At the same time, the visualization must display all of the information included in the dataset.

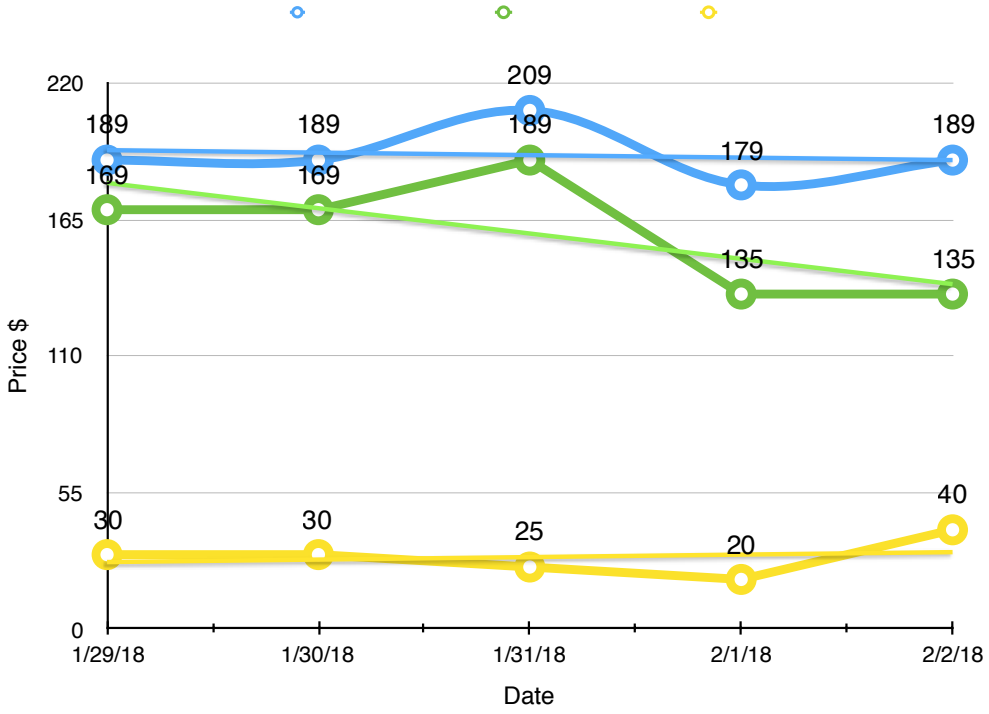
In the example below, the expressiveness principle is respected as all and only data from the example dataset provided is represented by the idiom.

Date	Price
1/29/18	189
1/30/18	189
1/31/18	209
2/1/18	179
2/2/18	189



2) Describe effectiveness principle for visualization? Then use an example visualization idiom to explain its effectiveness. (One page max)

The effectiveness principle states that the importance of the variable described should be reflected by the 'salience' (visual impact conveying importance) of the channel used to display it. The book ranks different visual encodings in terms of their effectiveness. For ordered attributes, a visual encoding displaying position of two variables on a common scale is the most effective, while encodings using curvature, color saturation, and volume are among the least effective. With regards to identity channels for categorical attributes, the spatial region is most effective while shape is last.
Furthermore, the author brings forth a number of concepts used to measure effectiveness. Accuracy determines the ability of the encoding to convey the level of magnitude related to multiple variables on an objective scale. Discriminability defines the ability of the human to differentiate the variables displayed based on visual factors used in the encoding.
Separability describes the level of interrelatedness between different channels relating to different variables which are in certain ways intertwined with one another. Popout defines the extent to which a channel 'stands out' from the rest of the dataset, while grouping describes the belonging for different channels to the same categories and can be conveyed with different techniques to display channels including proximity, similarity, and containment with respect to one another.
The example below shows the same visual encoding as in the section above, with the addition of two more price series (green and yellow). For each of the three series, a trend line is drawn in a color that is a lighter shade the respective price curve. This way, the importance of the series as a main source of information is kept while also easily pointing out the relatedness of the series with its associated trend series.



3) Separate the following channels as magnitude and identify channels in their effectiveness order from most at top to least at bottom

Most to least effective:

Magnitude channels:

1) Position
2) Length
3) Tilt
4) Area
5) Color Luminance
6) Color Saturation

Identity channels:

1) Spatial region
2) Color hue
3) Shape