A. Description of the Data

Where we got the data

We got the bitcoin data from Xiao who had an Amazon EC2 server running the script for the past few months. It gave us by-the-minute prices of bitcoin from Dec 2013 - April2014. The file came out to 5mb so Xiao had to do a lot of cleaning and formatting.

Data variables

There were three variables, datetime, buying price, and selling price. Since buying and selling were the same, we only needed the first two columns. Datetime (renamed to time) was a string that had the bitcoin price at that minute. It was easy to convert this string to a Javascript Date object. Buying was renamed to price and was a simple float that was easy to work with as well.

Data filtering/formatting

The main challenge with our data was changing the by-the-minute data to hourly, daily, and weekly data. Xiao ran Python scripts to create the different datasets. For example, to get hourly data, we just averaged the 60 data points for that hour. For daily, we would average the 1440 data points for that day, and so on. He also had to clean a little as there were a couple of missing data points when the server went down temporarily. Overall, the dataset was pretty complete and we did not need to account for missing data points. Prices were volatile, but not so much so that missing a minute of data would change the result by much.

B. Mapping to visual elements

Scales

We used a time scale for the x-axis and a linear scale for the y-axis. The x-axis went from the first day Xiao started pulling data to April 20th when we started finalizing the data set. The y-axis was from the minimum to maximum price of the given data set. This changed depending on the timeframe. The styling was pulled from an example and was not very difficult or interesting. D3 was very powerful in that we only needed one function to draw different axes for each time frame.

Xiao used the D3 zoom behavior to allow users to scroll and drag the graph to zoom in and out. This gives users a closer look at the data especially when there are many data points at once.

At first the zooming was a little crazy - if you scroll a little bit, it would often zoom in really far and you can't see the data. Then we decided to place a limit on how far you could zoom: only 6x larger than the original. We also limited zooming out to at least 1x the original because it would make no sense to zoom out any further than our available data range.

Other Interactive Visual Elements

We had really fun visual elements such as hovering over a price point. Alice created this hovering functionality that showed the price and date of the data point as the user hovered over it. Dan created the profit calculation functionality that allowed the user to quickly see how much profit they would make given a valid time interval.

C. The Story

What it tells us

Our story was to visualize the price of bitcoin in the past months, especially since it is such an interesting currency. By presenting different timeframes for viewing, users can get a sense of how volatile bitcoin really is. You can see from the daily vs. weekly data that while there are general trends in the price, it changes very dramatically in a short period.

What was surprising?

Bitcoin is well known to be a volatile currency. Nevertheless, the rate at which the currency changes was surprising to see. As Bitcoin becomes more popular, one would expect it to become more stable over time, which is not the case as shown by our data. In addition, it is surprising to see that the value of the currency has been following a decreasing trend in recent months. Although China has tightened regulations on Bitcoin, more and more organizations around the world are now accepting it as a valid method of payment, so it is definitely surprising that the value has dropped so dramatically in the past couple of months.

Responsibilities

We had many different ideas for this project, and many of them were cut after a lot of time in development. Each member contributed to all parts of the project and we completed similar amounts of work, but not all of our work are in the final product. We chose the feature set we believed helped users see the story best, without overwhelming them with interaction. Below are the main responsibilities of each member, although we eventually fixed each other's bugs in each part.

Xiao - data wrangling, zooming functionality using scrolling
Dan - drawing the graphs, calculating profits, deprecated zooming using date inputs
Alice - hovering functionality, formatting data, design
Brian - deprecated animating graphs, hovering functionality, much bugs