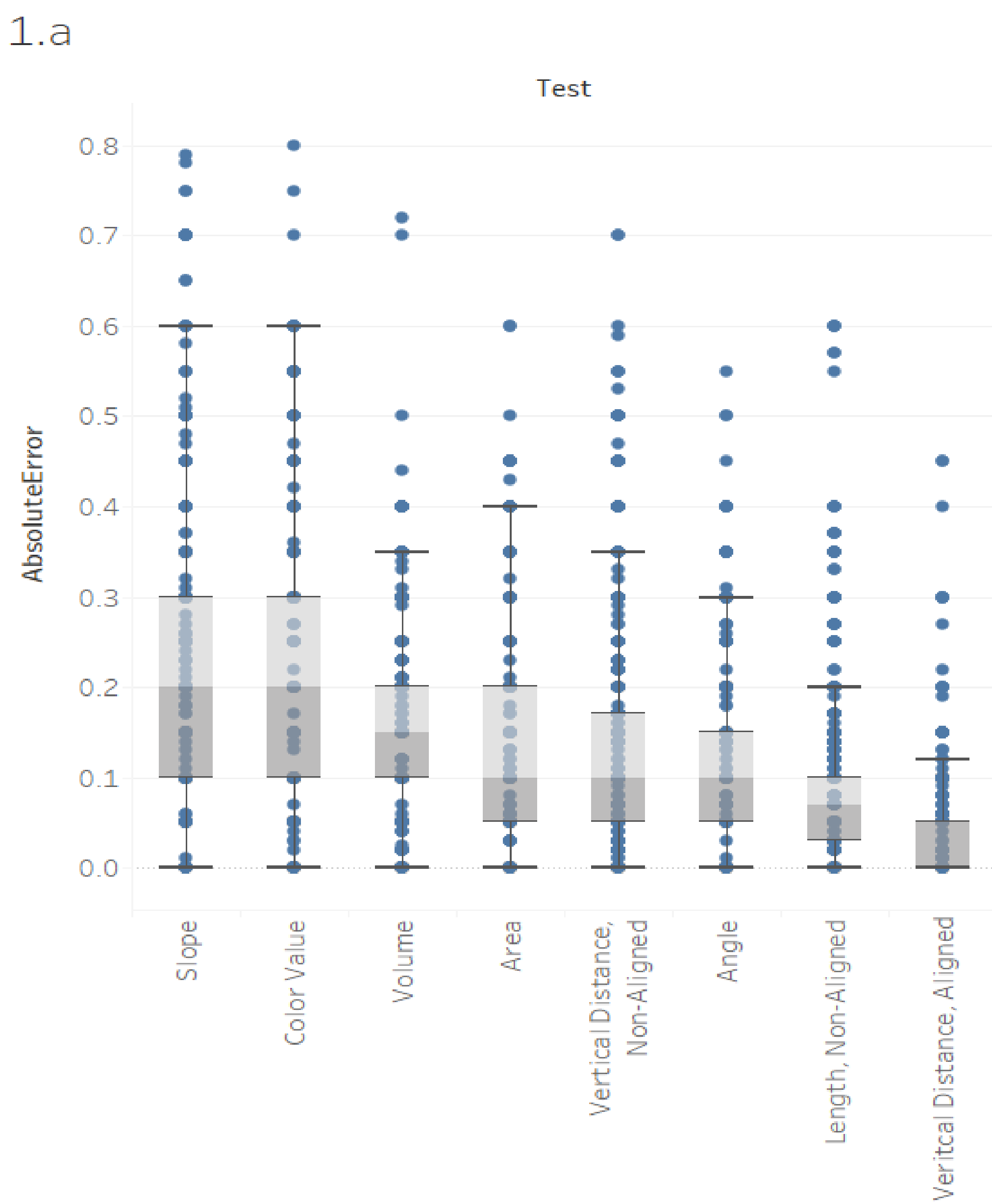
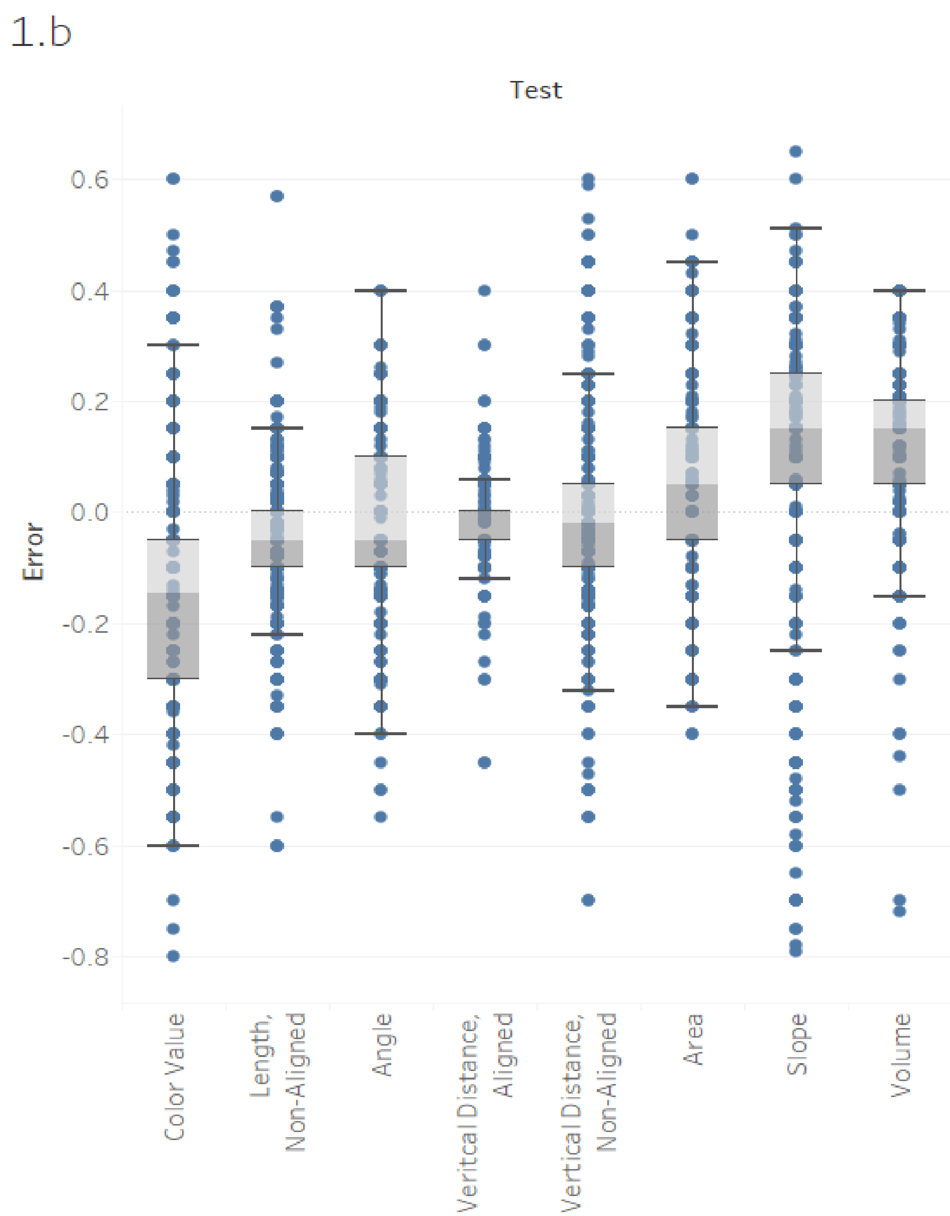
1.



a.

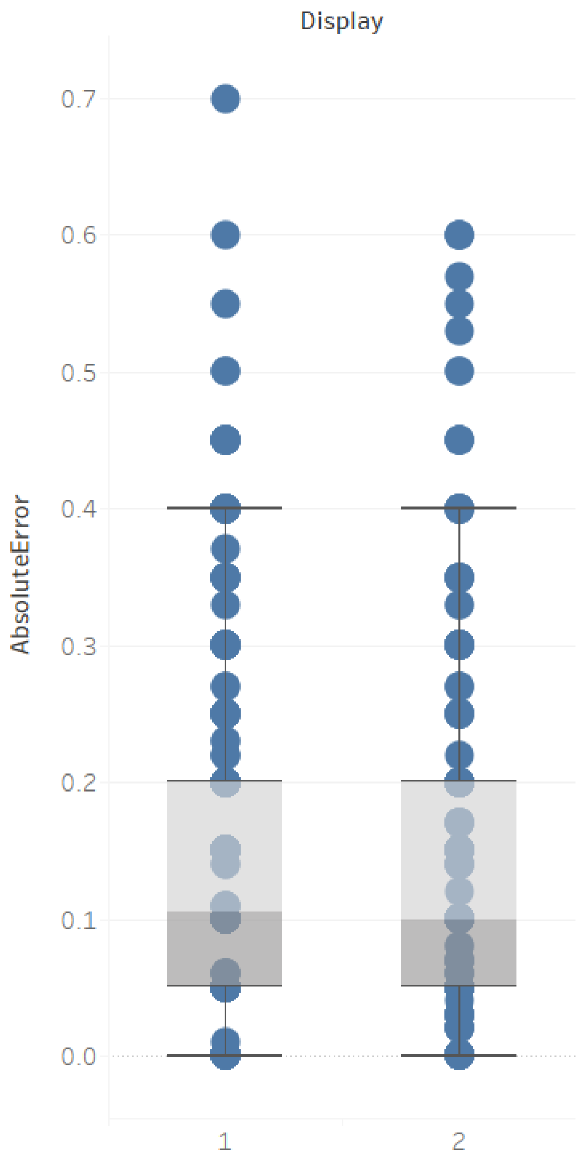
As seen from the graph, the “Vertical Distance, Aligned” test has the smallest distribution with a few outliers. IT is also very concentrated between 0.0 and 0.1. Color value and slope both have large distributions with the Inner Quartile range of 0.2. This is the largest IQR out of all of the tests. The slope distribution appears to have more responses in the IQR than the color value.

b.



By plotting the Error, you can see which tests showed over and under estimations. Anything below 0 is an underestimation and anything above 0 is an over estimation. You can easily see in the boxplot above that color value was mostly under-estimated, while slope was mostly over-estimated. We can also see that Vertical Distance, Aligned has an IQR around or at 0, which makes sense because this is the type of visualization that is easier to decode.

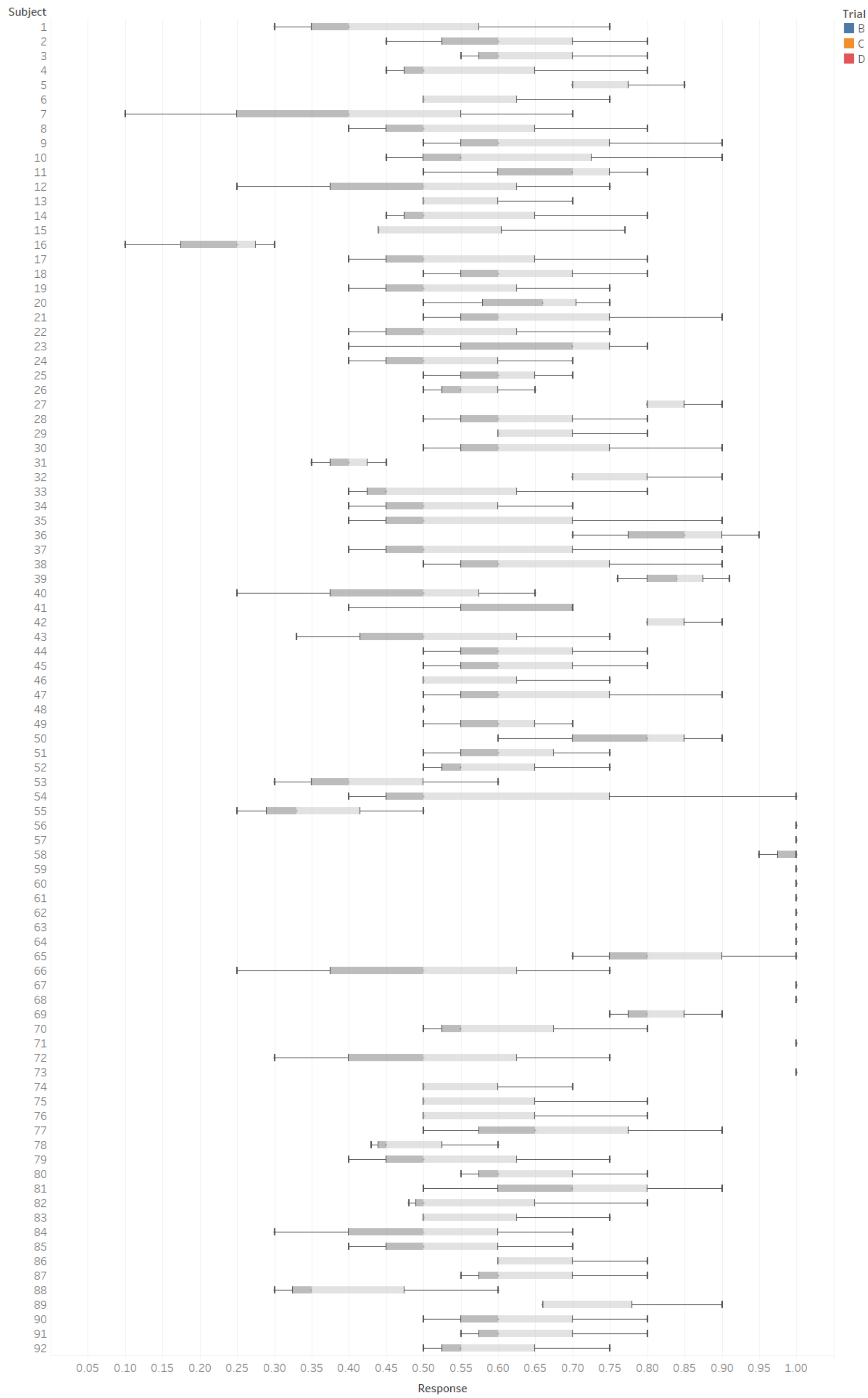
1.c



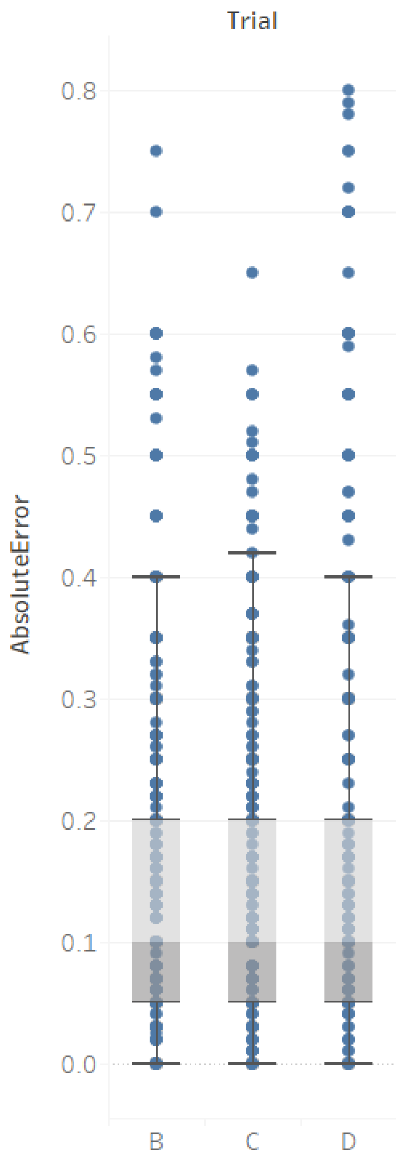
You can see from the table about that display 2 has more answers clustered around an absolute error of 0.0 to 0.1. This tells us that the subjects had better responses, or closer responses to the actual value, on the second display. On the first display most of the absolute error responses were clustered around 0.2 to 0.3.

1d.

1.d

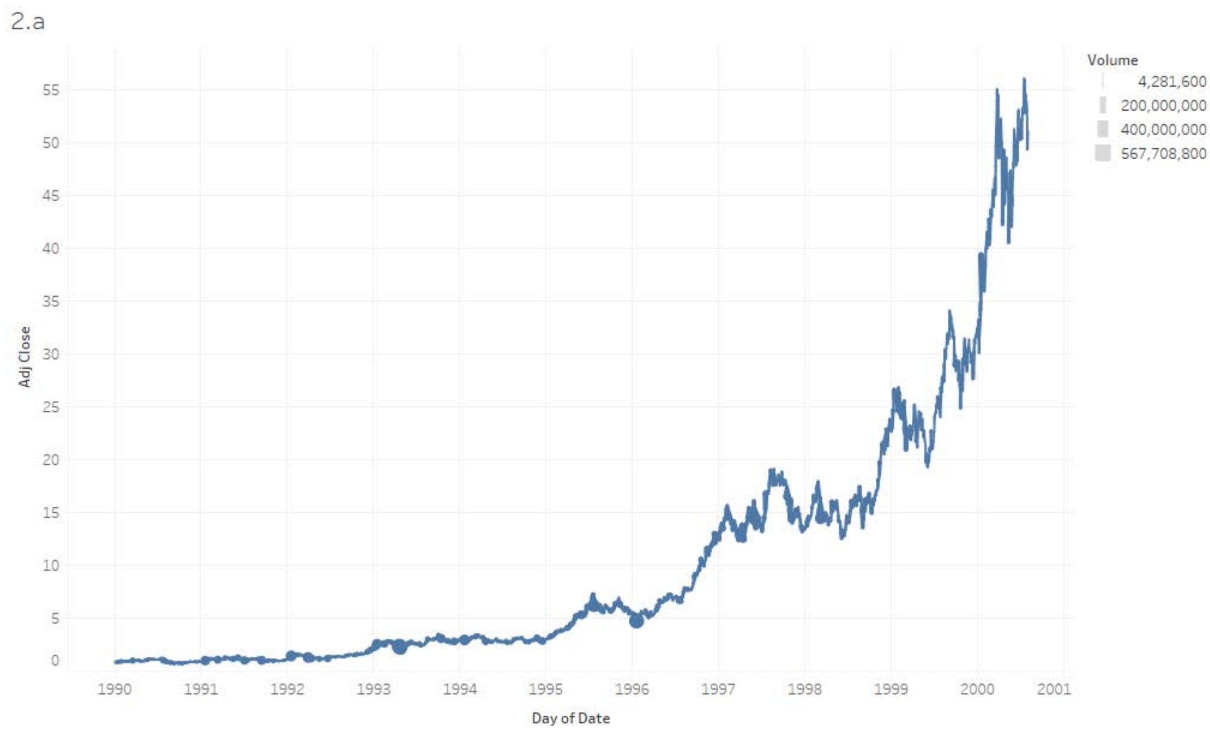


1.e



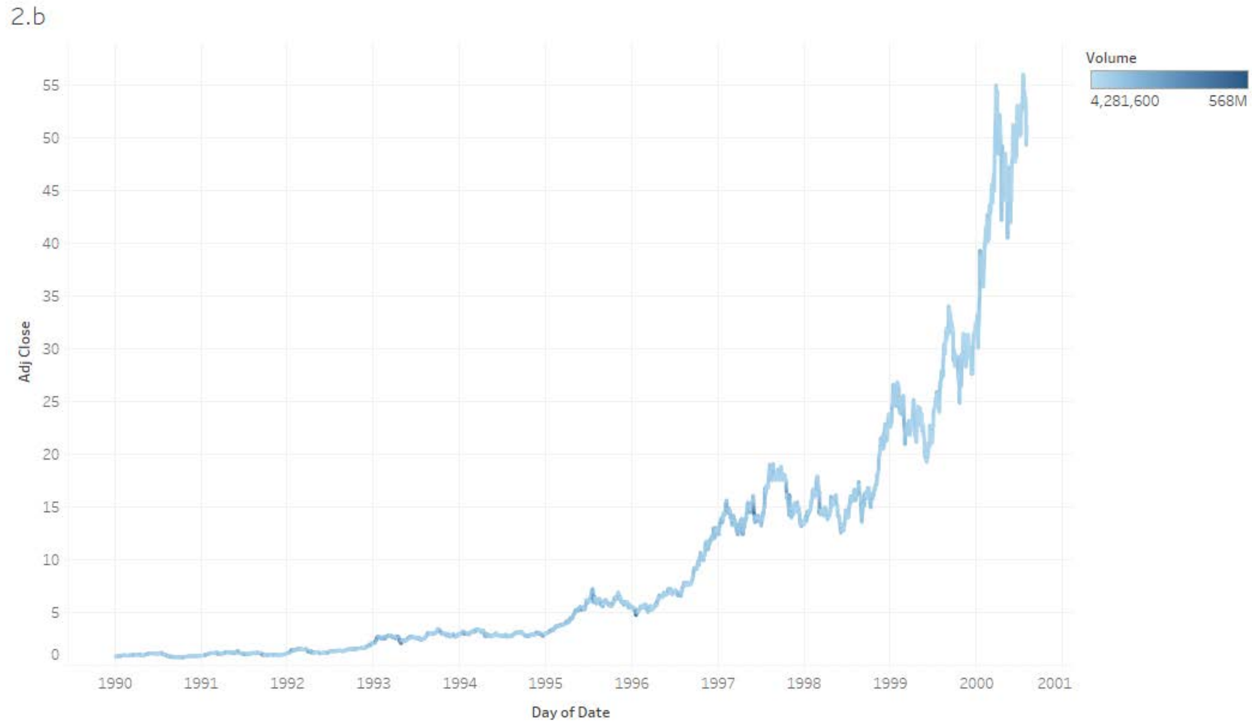
Above shows the Absolute error over the 3 trials or 3 pictures shown at one time. It shows that there is not much variation over the three trials. It is interesting that Trial D has more outliers than the other two trials. This might indicate that the 3rd picture (trial D) was harder to read the true value than the other two trials

2a.



The trend of sum of Adj Close for Date Day. Size shows sum of Volume.

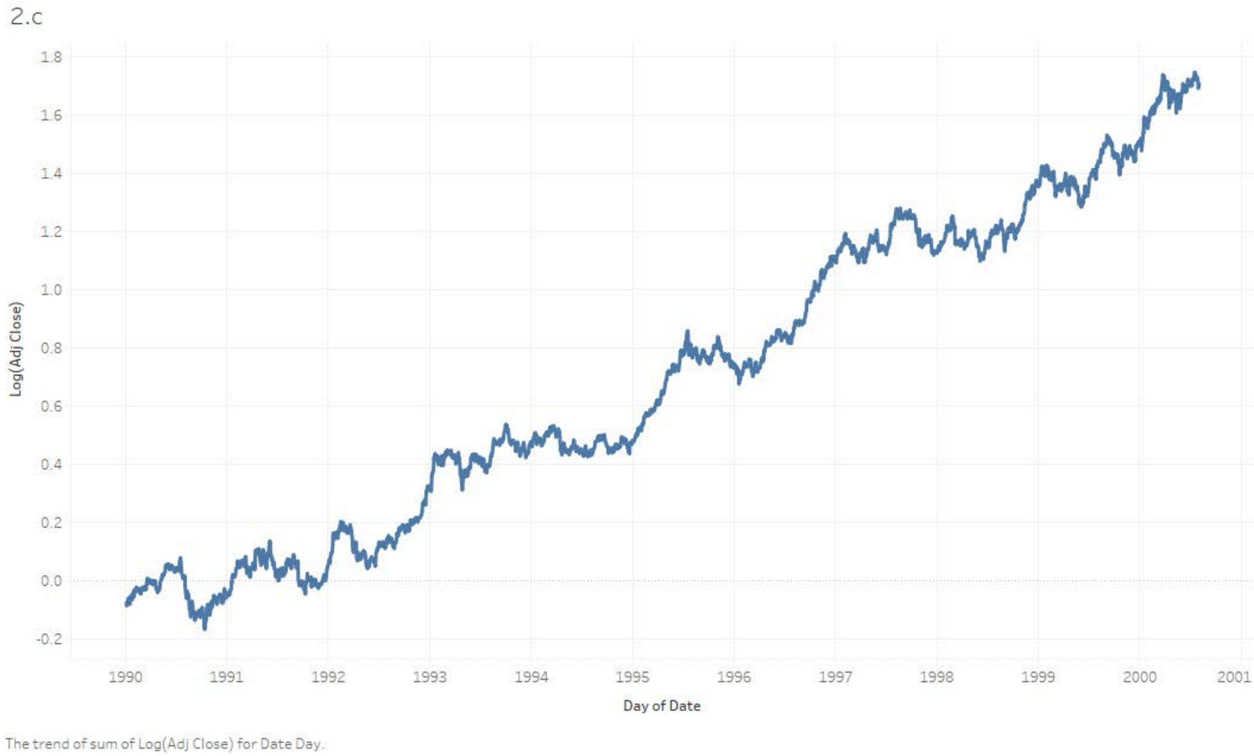
2b.



The trend of sum of Adj Close for Date Day. Color shows sum of Volume.

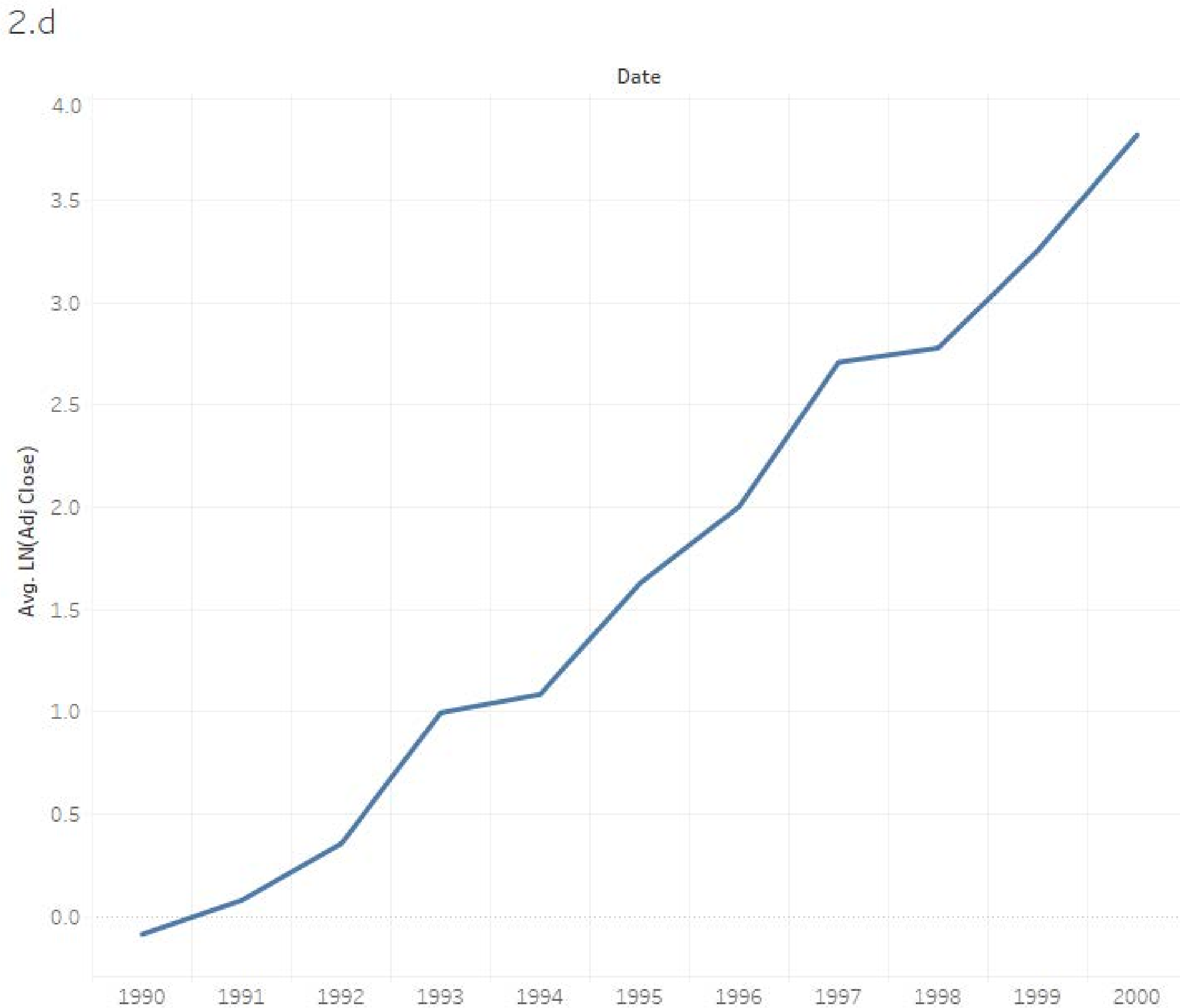
Both graphs have a hard time showing the change in volumes. The color graph (2b) communicates the volume slightly more effective. There are parts of the graph that are darker than others and are easy to point out.

2c.



By adding a Log scale, the graph goes from exponential to linear. This allows the differences in the Adj. Close to stand out more.

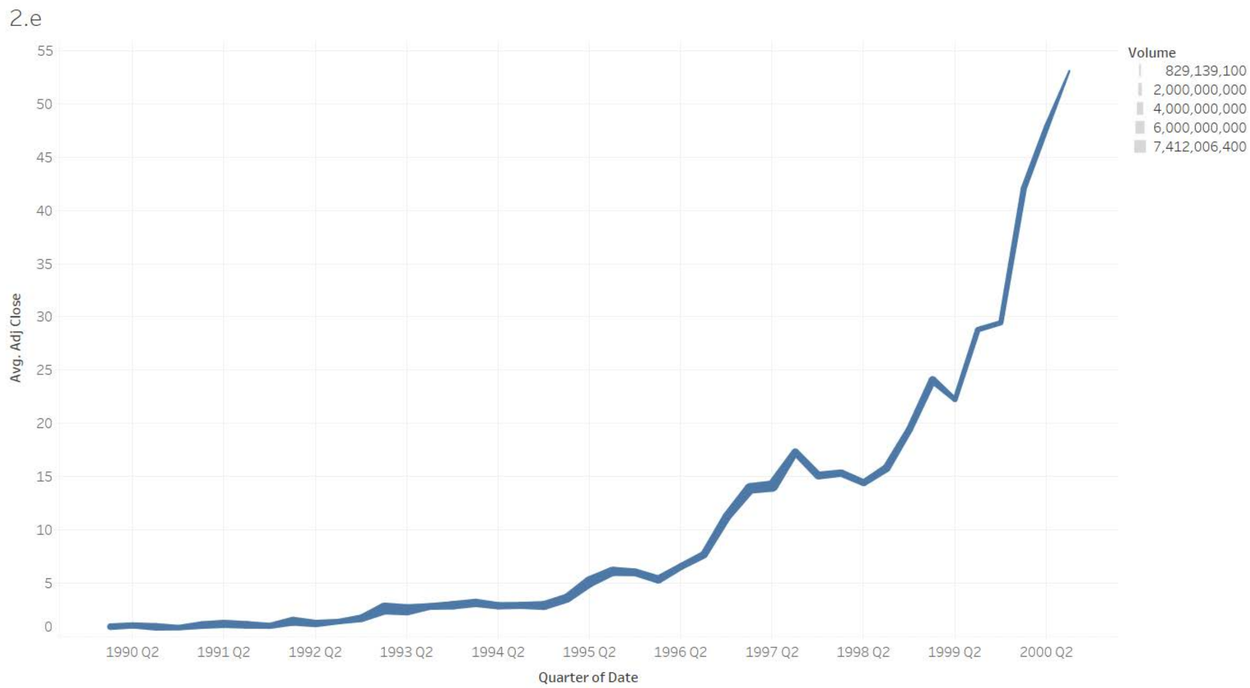
2d.



The trend of average of LN(Adj Close) for Date Year.

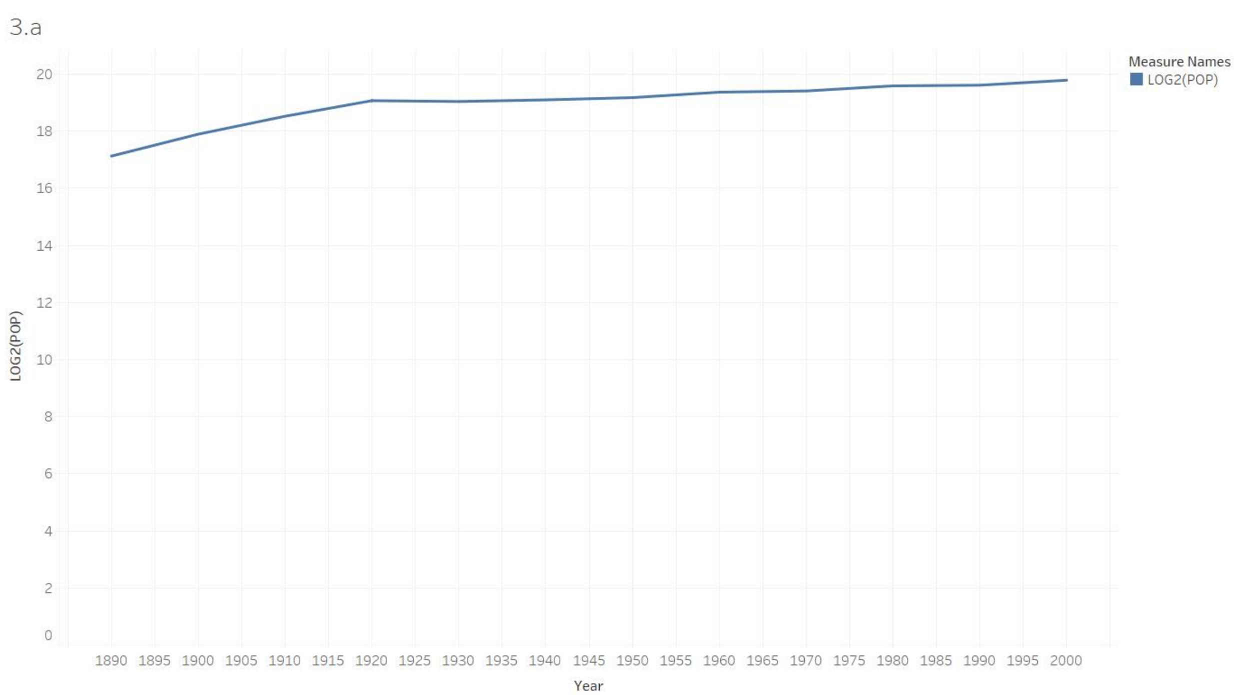
The greatest %-increase was from 1996-1997. The graph shows the values from about 2.0 to 2.7 which is a 7% increase.

2e.



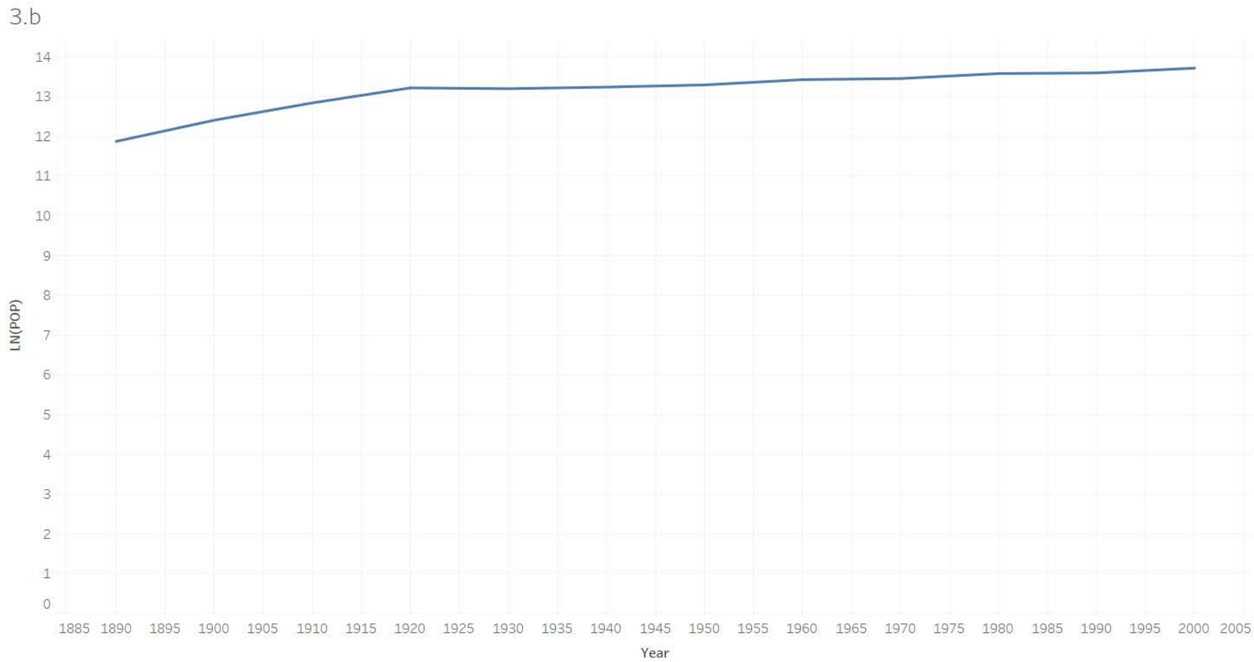
By adjusting the graph to only include the Quarter Adj close values, the change in volume is more prominent. As time increases, the volume decreases.

3. a.



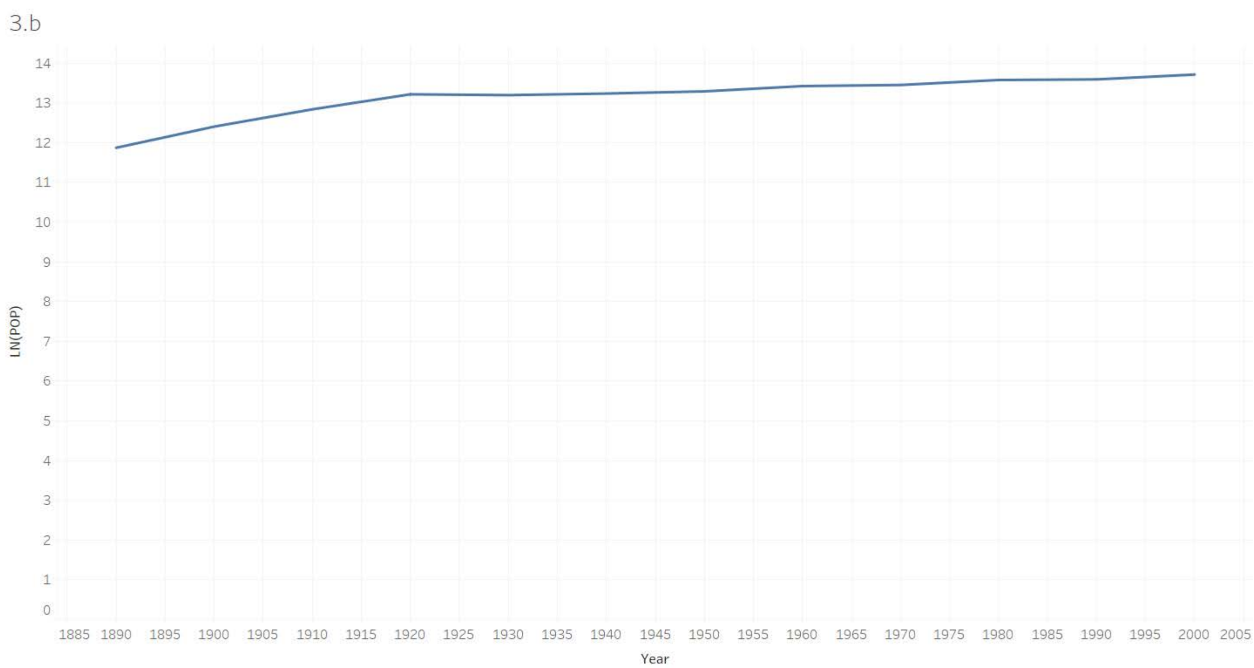
Using a Log base 2 scale, you can see that the population doubled between 1890 and 1920.

3b.



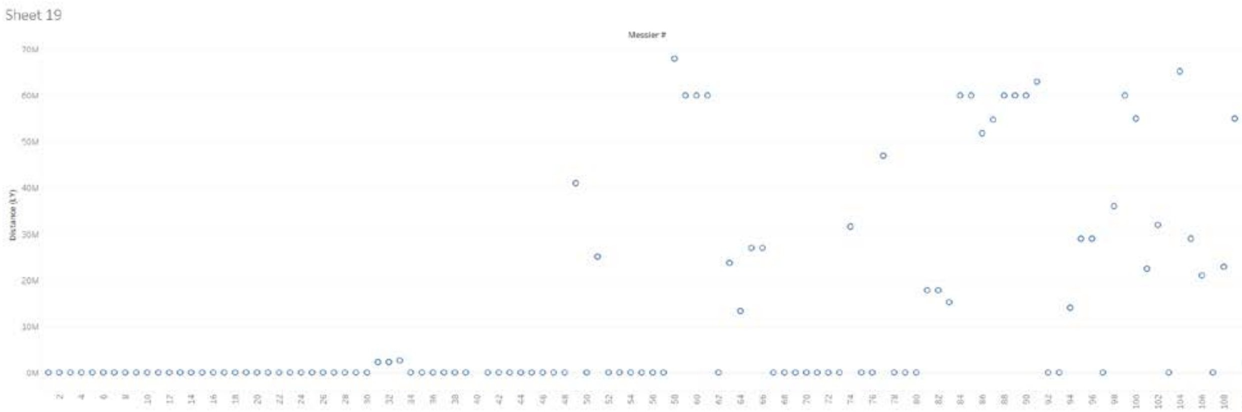
The percentage rate of change has decreased over the years to an almost steady state. The years with the greatest percentage rate of change are between 1890 and 1920. This is shown using a natural log scale of the population.

3c.



Years 1920-1920 had a roughly 37% change in population. Years 1900 to 1910 had roughly a 40% change in population and years 1890 to 1900 had about a 50% change in population. This is shown using a natural log scale of the population.

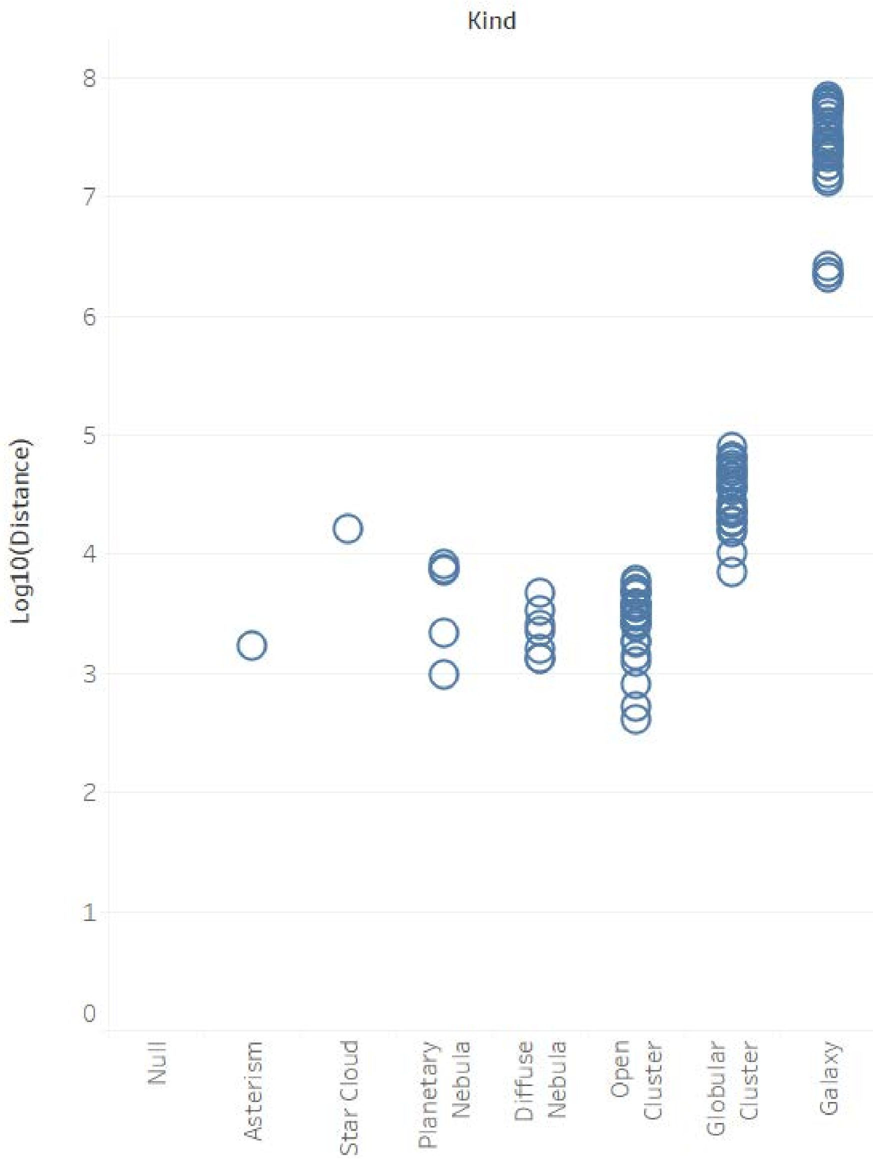
4. a



The graph shows the Messier number vs distance in LY. There is only a slight correlation that the higher the number, the further away in distance.

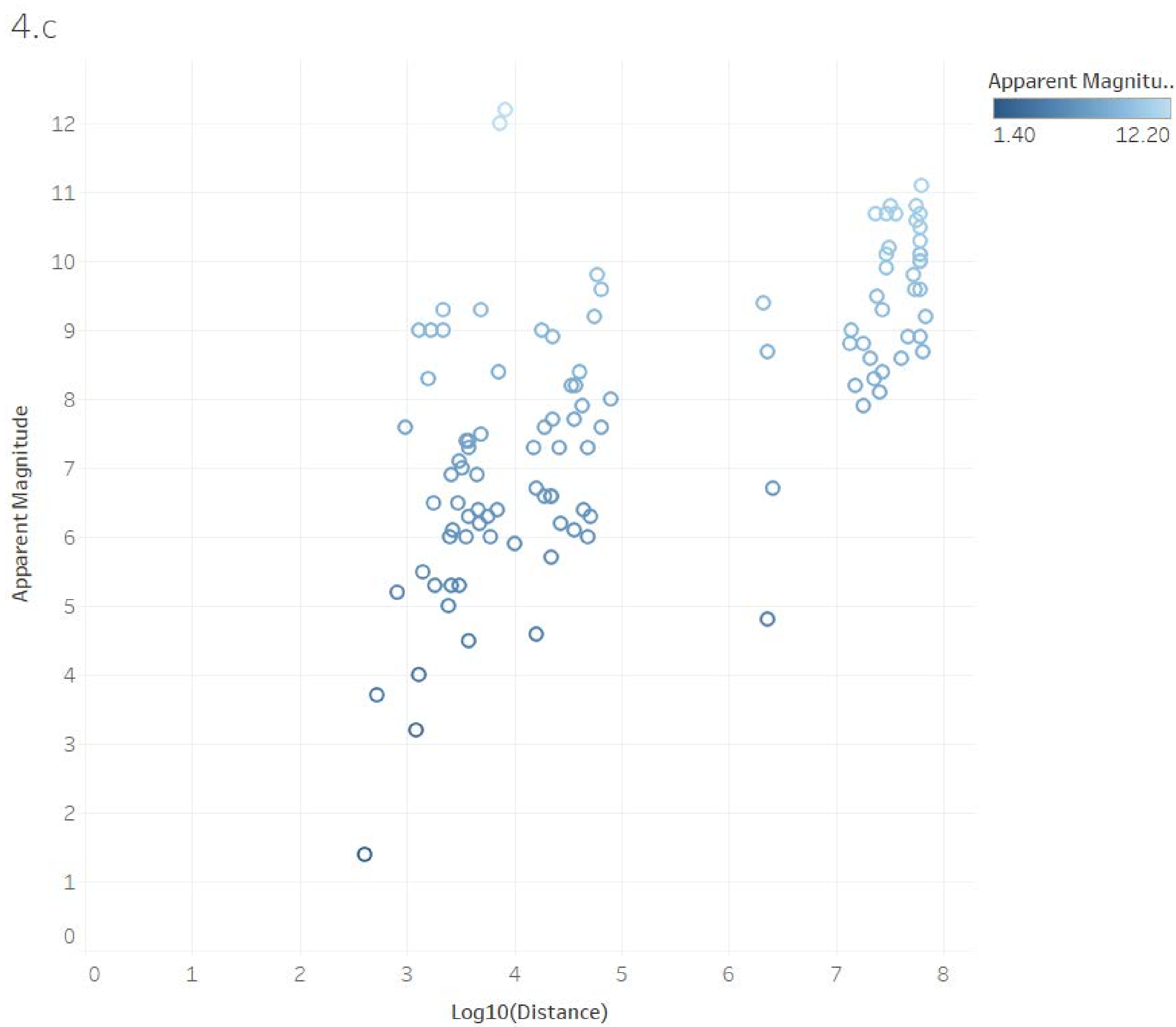
4b.

4.b

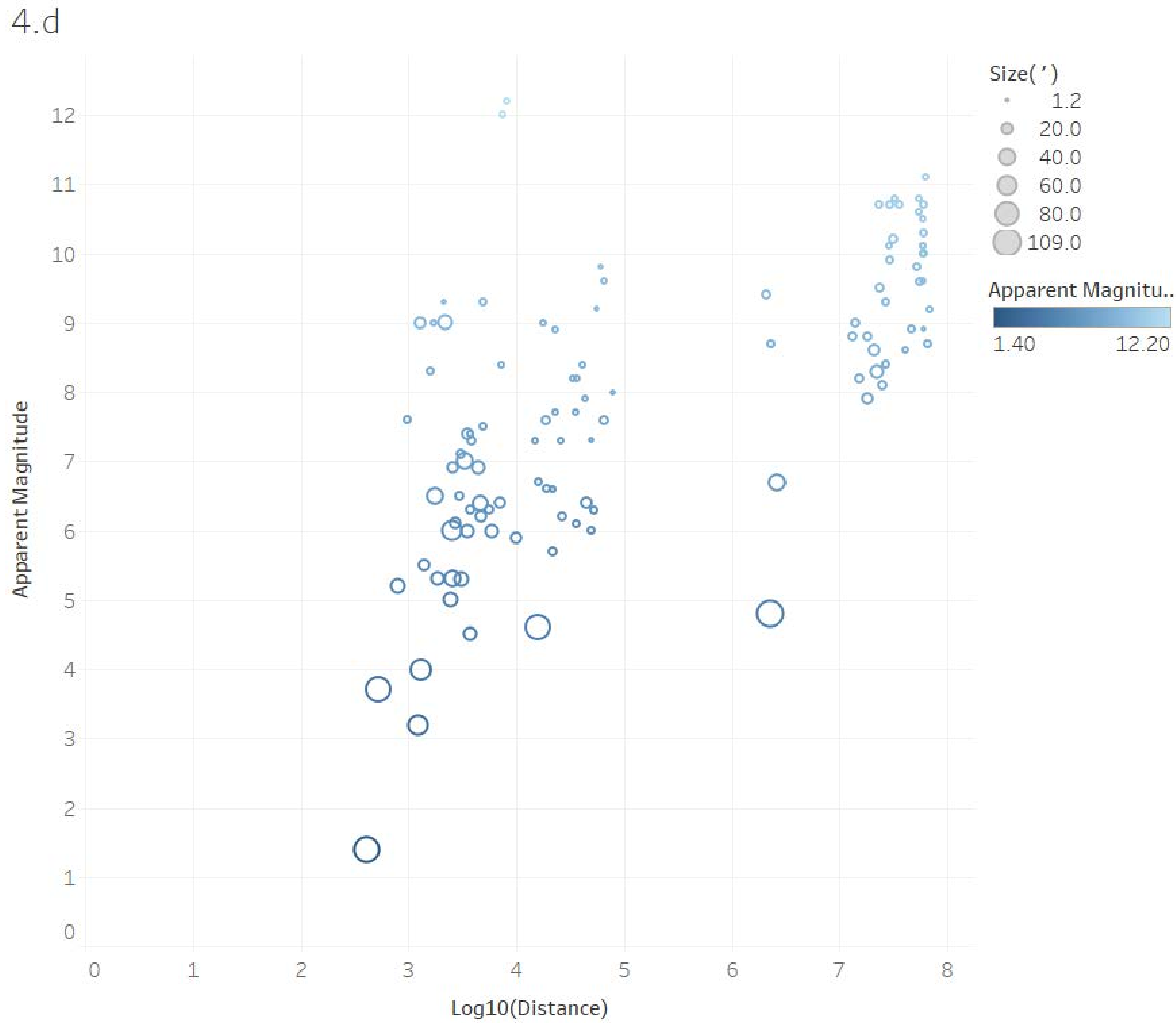


Kind
Log10(Distance)
8
7
6
5
4
3
2
1
0
Null
Asterism
Star Cloud
Planetary Nebula
Diffuse Nebula
Open Cluster
Globular Cluster
Galaxy

4c.

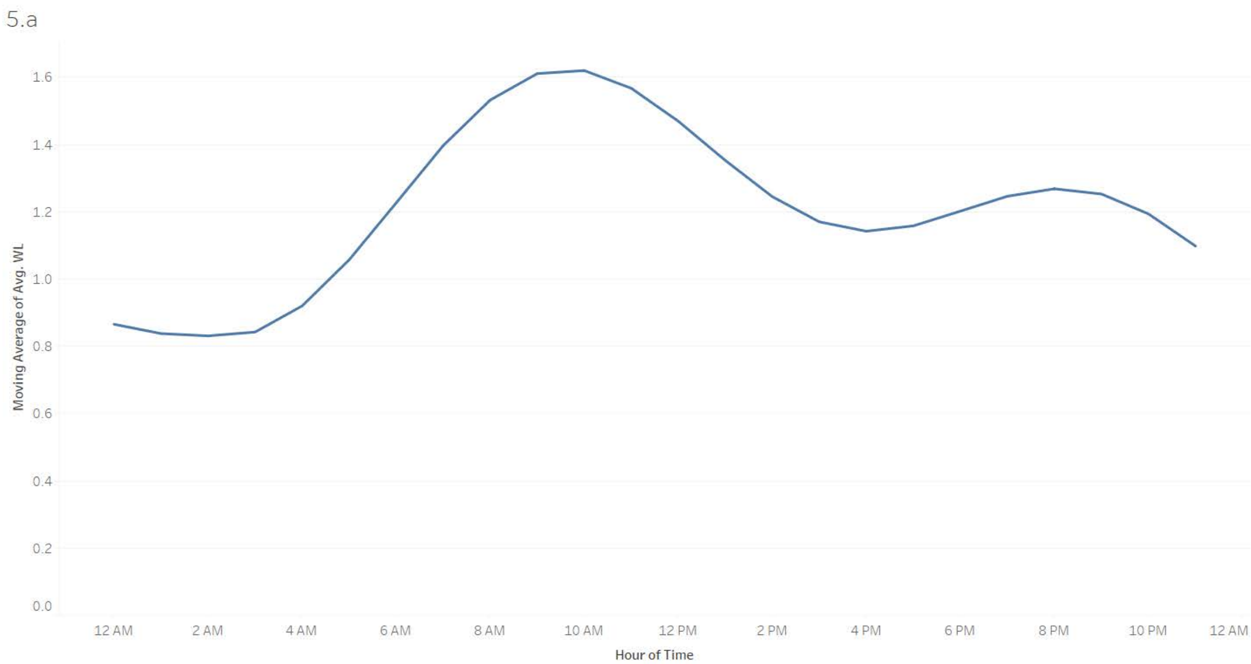

4.c
Apparent Magnitu..
1.40
12.20
Apparent Magnitude
Log10(Distance)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
1
2
3
4
5
6
7
8

4d.



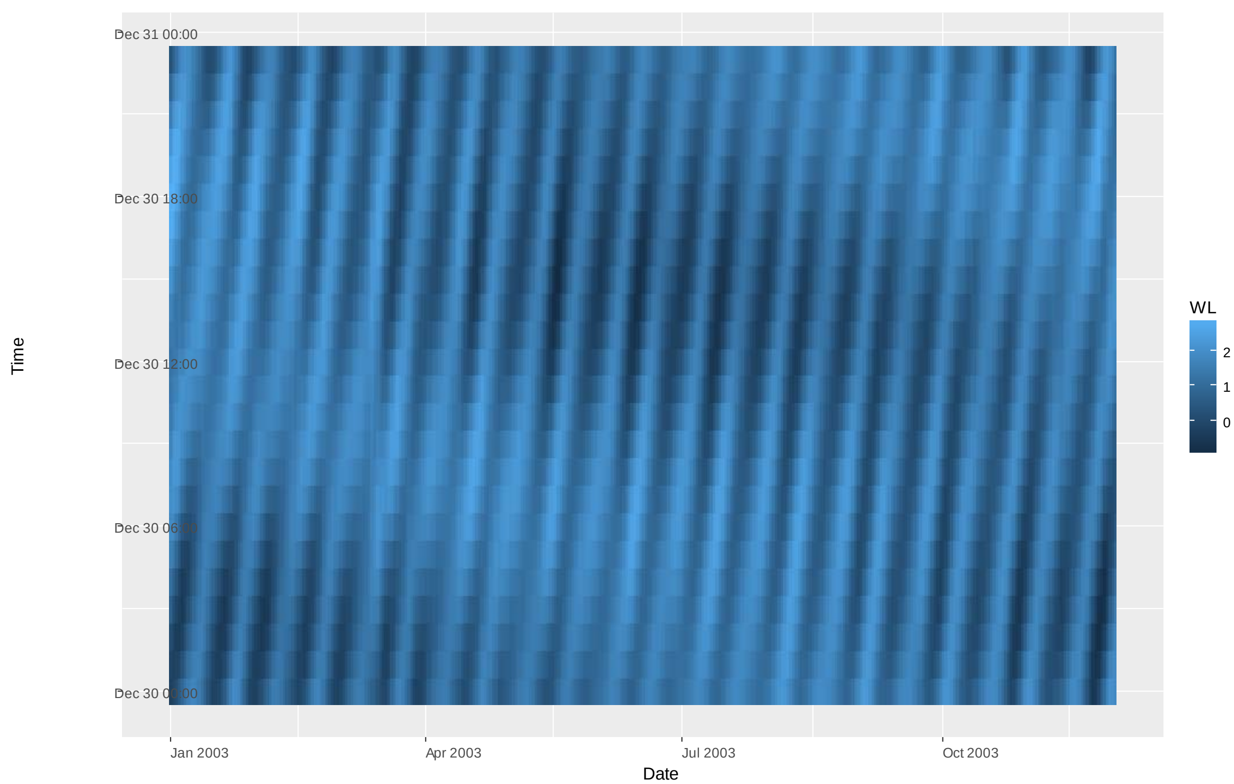
This graph makes it very easy to analyze all aspects of the graph. The color visualizes that the objects which are further away are fainter in the sky. The also are smaller in size. The objects closer are brighter in the sky. You can see from all of this that it appears the objects that are closer and brighter are also larger in size.

5a.



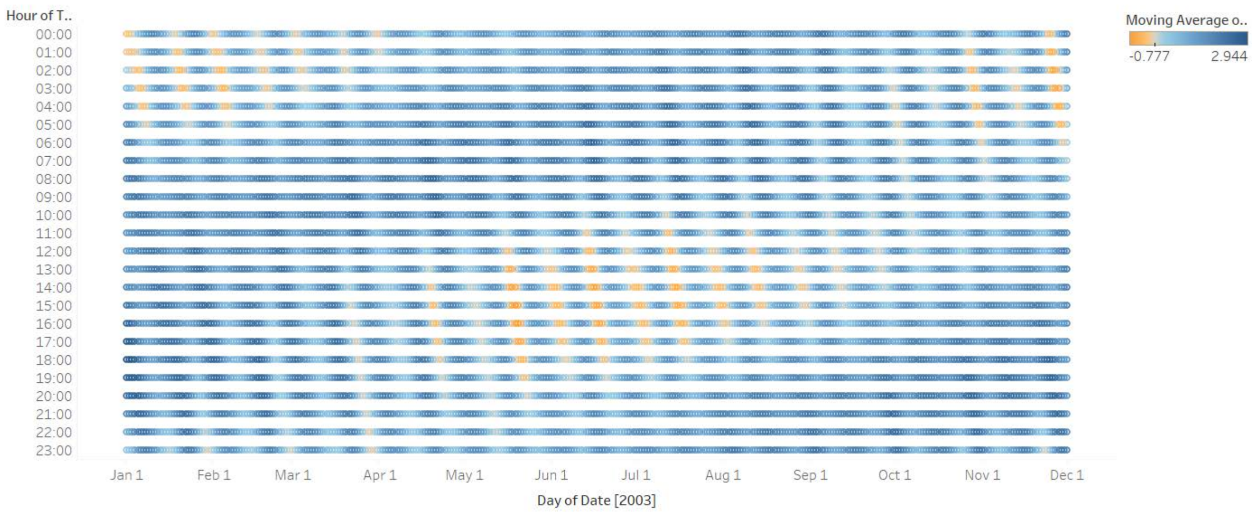
5.a
Moving Average of Avg. WL
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
12 AM
2 AM
4 AM
6 AM
8 AM
10 AM
12 PM
2 PM
4 PM
6 PM
8 PM
10 PM
12 AM
Hour of Time

5b.



Dec 31 00:00
Dec 30 18:00
Dec 30 12:00
Dec 30 06:00
Dec 30 00:00
Time
Jan 2003
Apr 2003
Jul 2003
Oct 2003
Date
WL
2
1
0

5.a



This first graph in 5a shows the average fluctuation in water levels over time. This is for a year time frame. The second two graphs are essentially the same. One was created in R and one in Tableau. The second graph shows that the water levels are lover in certain months are certain times of the day. The first graph only allows you to make conclusions based on hour, while the second graphs allows you to make conclusions based on time on the year.

Code used to create the second graph in R.

```
p <- ggplot(data, aes(x=Date, y=Time, fill = WL))

> p+ geom_tile()

> p+geom_raster()
```