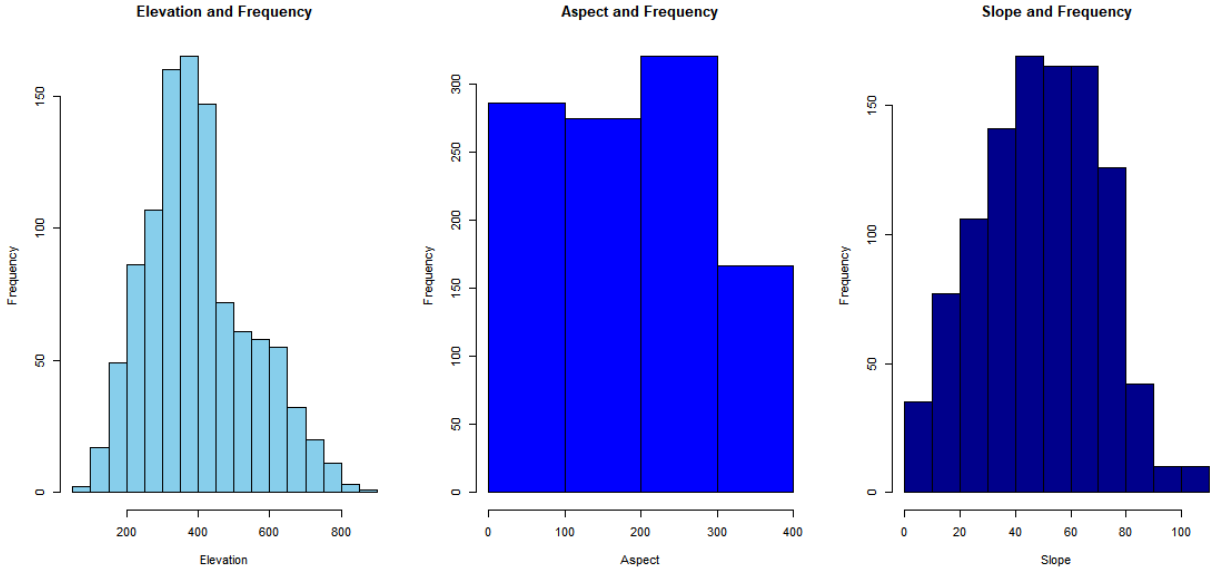
Julia Vineyard

Worked with: Jessica Bonin

Data Exploration and Deterministic Function

1. Plot all 3 histograms for terrain



2. Overall, the histogram shows that there are a different number of sampling points, shown as frequency, for each elevation shown as 200 meters, 200 meters, 600 meters, etc. The 3 highest categories around 400 meters shows that the highest frequency of sampling points were taken from 300-400 meters in elevation. The shape of the histogram stretches further to the right than it does to the left, showing that there are more sampling points at the elevations equal to or lower than 400 meters. This stretching to one side also indicates a skewed distribution rather than an even distribution.

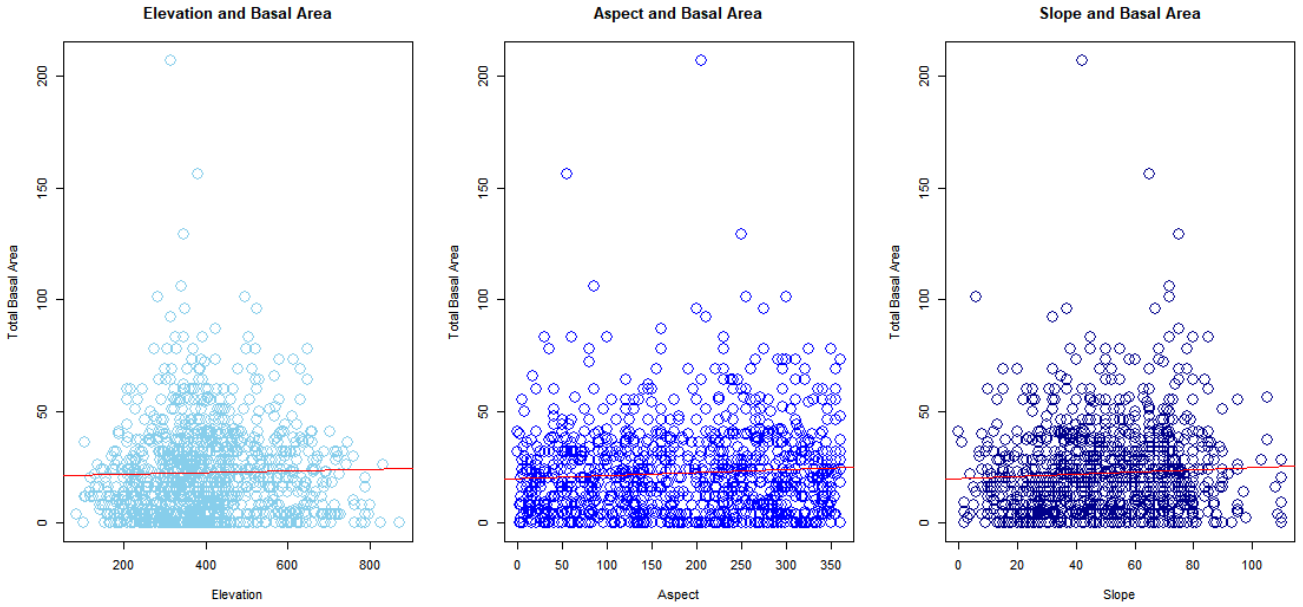
3. The unit of slope in this dataset is percent slope.

4. The histogram that has the slope (as percent slope) on the bottom axis and the frequency of sampling points (frequency) on the side axis shows that the distribution of slopes is more even than the distribution of elevations that we looked at previously. This can be interpreted by the graph not having 1 side that has a longer “tail” or in another way, having 1 side that stretches out further than the other from the highest peak. You can see that the greatest number of sampling points occurs between the 40-60% slope range, but there is a mixture of flat and very steep sampling points coming off of either side of that peak. Thankfully for the researchers there are more sampling points on the flatter side of 50% (0-45% slope), but there are a considerable number of points that are greater than 50% slope, especially in the 50-65% slope range.

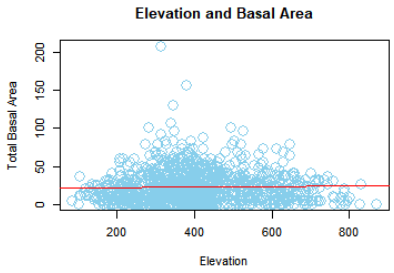
5. Aspect is the compass degree that a slope faces. If a side of a mountain side faces to the south it is a 180 degree aspect. If a mountain side faces to the east it has a 90 degree aspect. In looking at the histogram plotting aspect 250 degrees is the most frequent, meaning that most of the mountains on which a sampling site was located was a west southwest facing mountain.

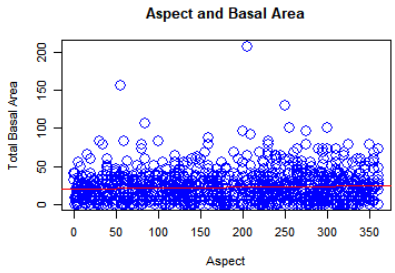
6. When considering the histogram plotting the aspect at which the sampling sites were located you can see that there is no curve like there was in the other two plots, indicating that there is a random distribution. You can see that the majority of the mountains are at 250 degrees, meaning that they are west southwest facing. The fewest number of slopes are in the 350 degree range, north northwest.

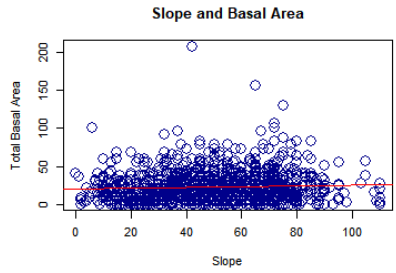
7. Create scatterplots of total basal area and each of the terrain variables.

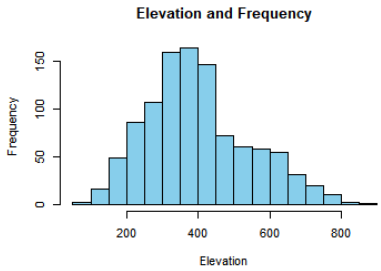


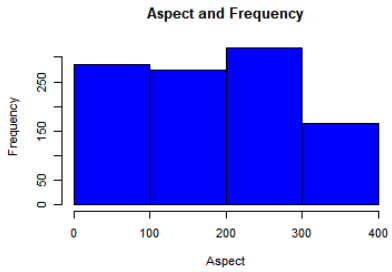
8. There is no noticeable association between total basal area and any of the terrain variables. For that reason I decided to use linear regression to fit a line to the data rather than manipulate a line that cannot be based on any visual trends observed in the data. Even with using linear regression I don't believe that the linear model is a good fit for any of the scatterplots as there is no interpretable linear relationship between total basal area and any of the terrain variables.

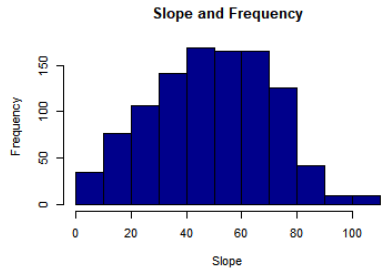

Elevation and Basal Area
Total Basal Area
0
50
100
150
200
200
400
600
800
Elevation


Aspect and Basal Area
Total Basal Area
0
50
100
150
200
0
50
100
150
200
250
300
350
Aspect


Slope and Basal Area
Total Basal Area
0
50
100
150
200
0
20
40
60
80
100
Slope


Elevation and Frequency
Frequency
0
50
100
150
200
400
600
800
Elevation


Aspect and Frequency
Frequency
0
50
150
250
0
100
200
300
400
Aspect


Slope and Frequency
Frequency
0
50
100
150
0
20
40
60
80
100
Slope