FiSource: https://earthquake.usgs.gov/earthquakes/feed/
Download date and time: March 4, 2020 17:00 EST
Format: .csv
The .csv file contains the following information:
Time, latitude, longitude, depth, mag, magType, nst, gap, dmin, rms, net, id, updated, place, type, horizontalError, depthError, magError, magNst, status, locationSource, magSource

The variables used in this analysis include latitude, longitude, depth, and mag. Latitude and longitude are in decimal degrees with negative values representing southern and western locations respectively. Depth represents the depth of the event in kilometers. Mag is the magnitude of the event.

The script program-07.py takes the input file all_month.csv and creates the data frame earthquake_df using pandas read_table() function. The function genfromtxt() will not work because it requires a data type and the data in our .csv file has many types. Using this data frame, six figures are generated and output into .png files:

- histogram of earthquake magnitude (figure1)
- kernel density plot of earthquake magnitude (figure 2)
- spatial distribution of earthquakes (figure 3)
- cumulative distribution function of earthquake depth (figure 4)
- scatter plot of earthquake depth vs. magnitude (figure 5)
- Q-Q plot of earthquake magnitudes (figure 6)

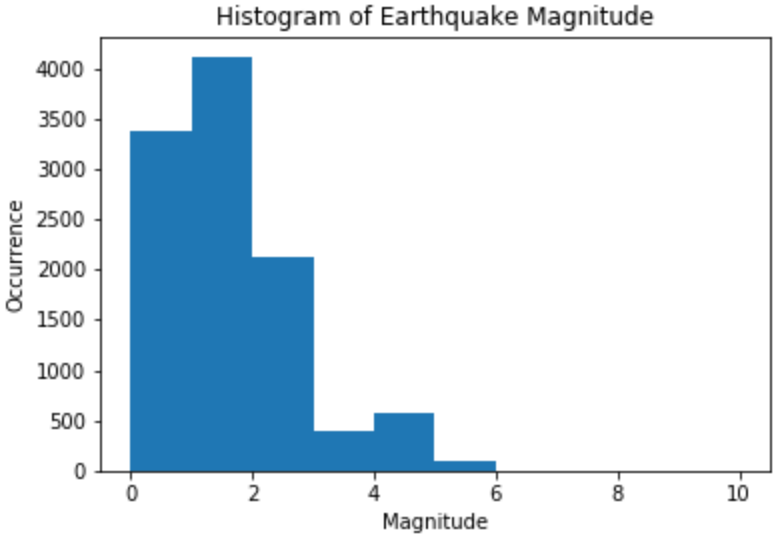

Figure 1: Histogram earthquake magnitude with a range of 0 to 10 and bin width of 1. Bin size changes the amount of data placed in one bin. A wider bin width would essentially lower the resolution of the data. The range effects the data being input. Having the range go out to 10 is unnecessary here as the magnitude doesn't go beyond 6, but it is also important to show the data does not go beyond 6. Magnitudes between 0 and 3 occur the most frequently.

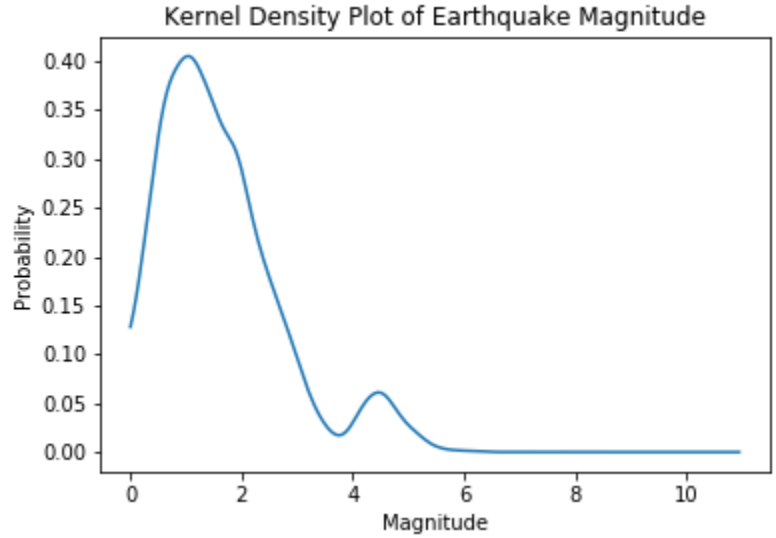

Figure 2: Kernel density plot of earthquake magnitude with a range of 0 to 10 set every .05. The density was set to gaussian and applied to the range. There are two peaks: one between 1 and 2 and the other between 4 and 5. This shows a higher likelihood for these values.

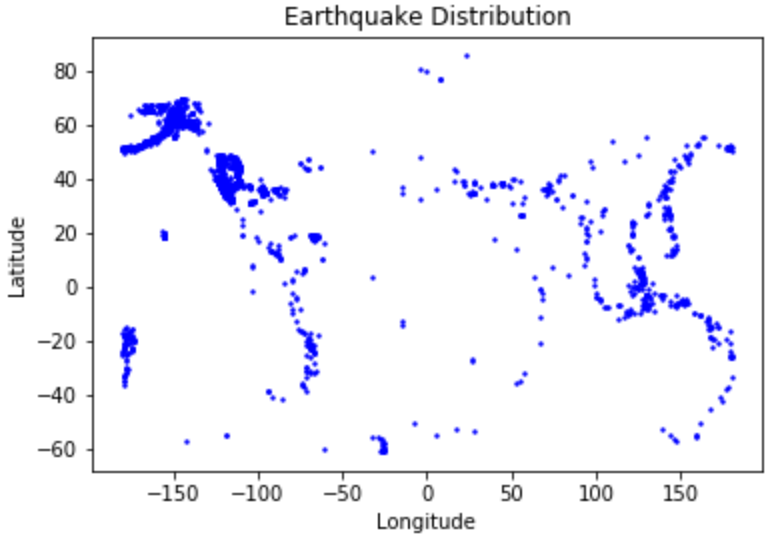

Figure 3: Distribution of earthquakes across the globe. Longitude is on the x-axis and latitude is on the y-axis to show it as one would see on a map. The most frequent occurrences appear to be along coasts and especially in North America.

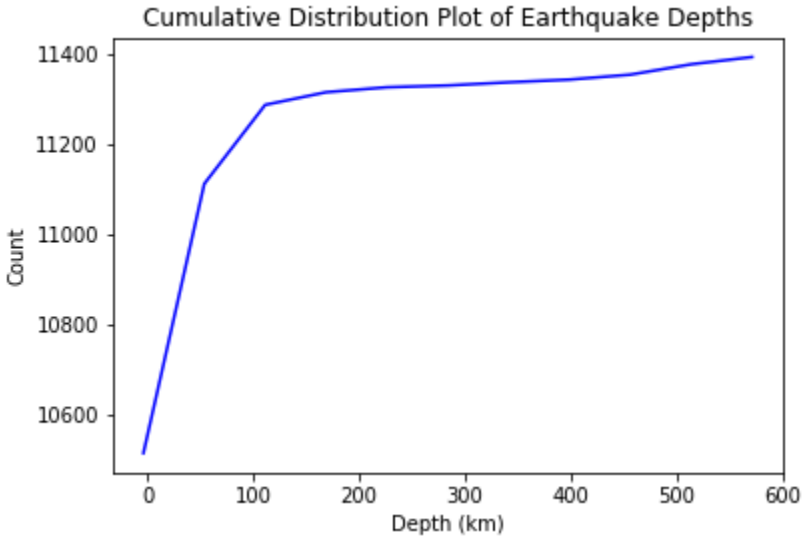

Figure 4: Cumulative distribution function of earthquake depths. The plot shows that most of the earthquakes occur at a depth between 0 and 150 km. There is then only a slight increase after this indicating fewer occur at deeper depths.

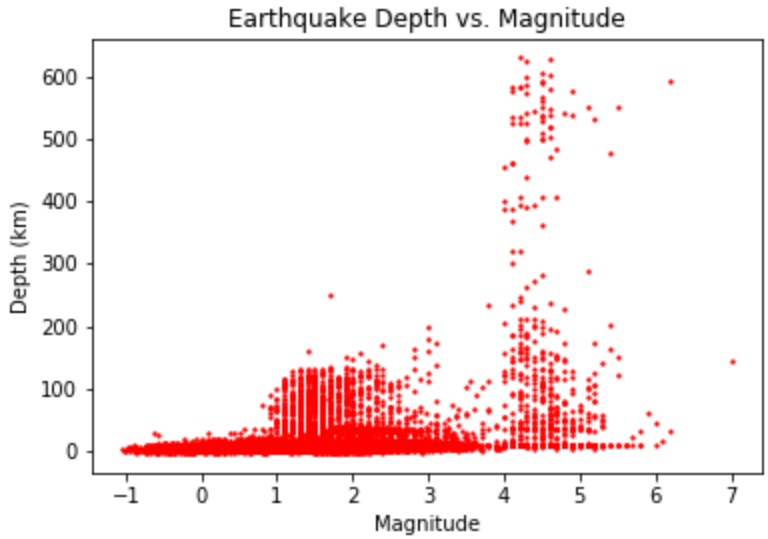

Figure 5: Earthquake depth vs. earthquake magnitude. It appears that certain magnitudes are limited to certain depths. Higher magnitude earthquakes (4 to 6) can occur very deep into the earth (up to 700 km) as well as more shallow depths while lower magnitude earthquakes (1 to 3) are limited to 0 to 200 km depths.

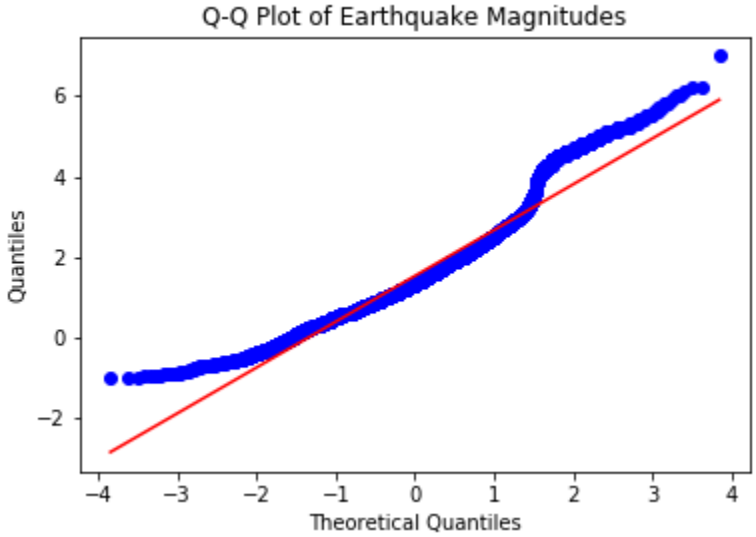

Figure 6: Quantile-quantile plot of earthquake magnitudes. This plot assumes a normal distribution. The red line indicates the ideal point placement for a normal distribution. Because the points don't follow closely to the line, it is unlikely this is an appropriate distribution to use.