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The data set used in this analysis was provided by the United States Geological Survey (USGS) as part of their earthquakes hazards program. Several monitoring programs from around the world contribute to this dataset including, but not limited to, the national earthquake information center (NEIC), the advanced national seismic system (ANSS), and the global seismographic network (GSN). For more specific information on the contributing monitoring programs, visit usgs.gov/natural-hazards/earthquake-hazards/monitoring. In the dataset, there is information about earthquakes around the world in the last 30 days from downloading. Information about each earthquake includes, but not limited to earthquake time (time), location (longitude, latitude, place), depth (depth), magnitude (mag), error associated with these variables.

This dataset was downloaded on Feb 27, 2020 at 1:07 pm.

The script that accompanies this metadata file (program-07.py) completes preliminary analysis on this data by graphing relationships between several variables. No statistical analysis is conducted. Graphs created include a histogram, and KDE (kernel density) plotof earthquake magnitude, scatterplot of earthquake magnitude vs depth, a normalized CDF of earthquake depths, a Q-Q plot of earthquake magnitudes, and a scatterplot of earthquake location using latitude and longitude.
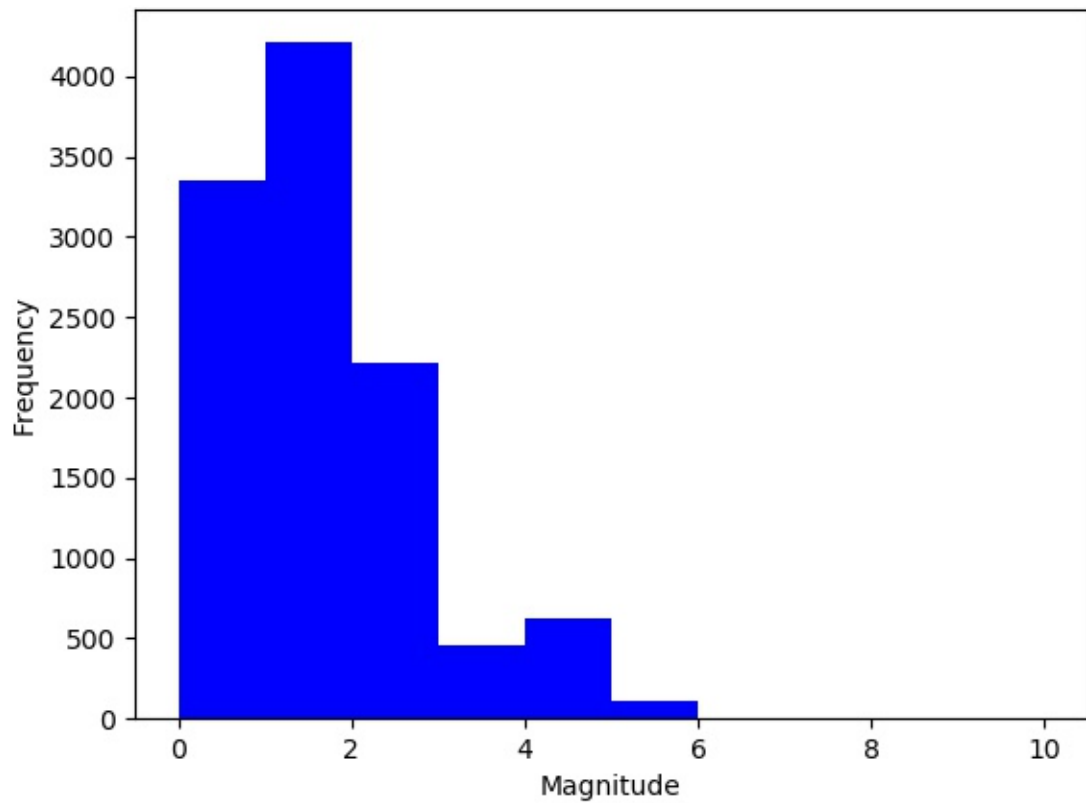
These graphs are shown in the figures below.

Figure 1. Histogram of earthquake magnitude. Most earthquakes have magnitudes between 0 and 3, with greatest number of earthquakes having a magnitude between 1 and 2. This histogram has 10 bins from magnitude 0-10.
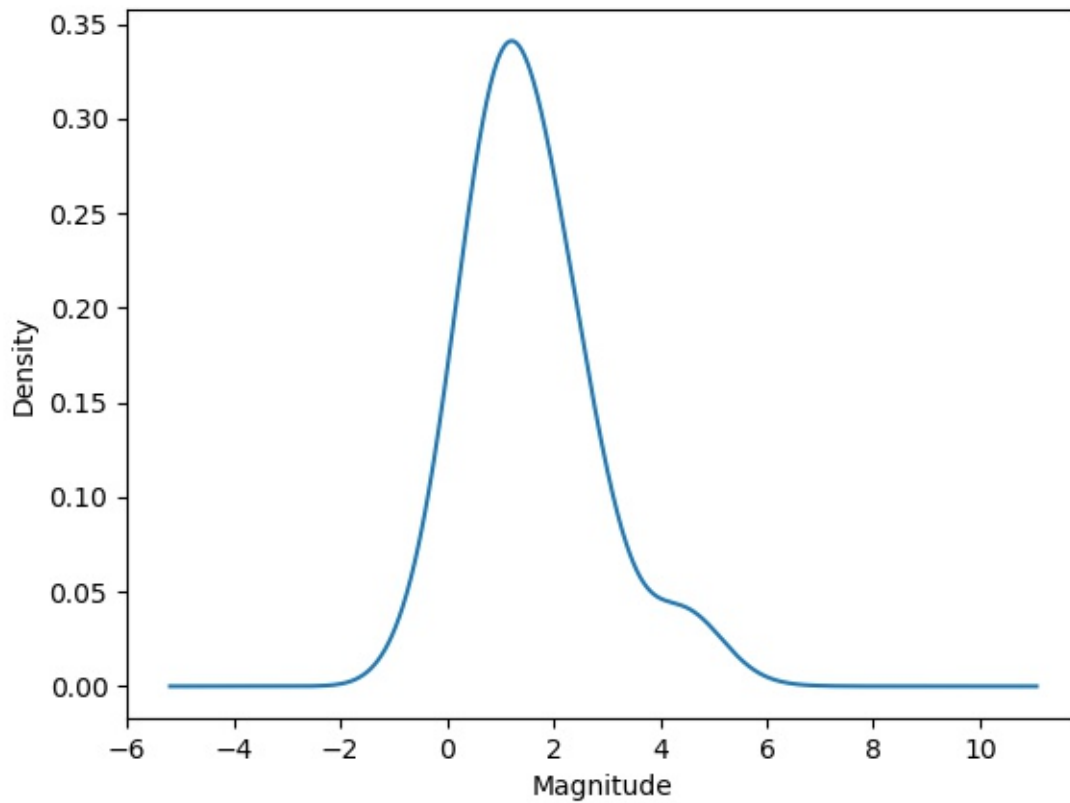
Figure 2. KDE plot of earthquake magnitude using the Scott kernel type and kernel width of 0.5. Using this width, the KDE supports Figure 1 that peak density of earthquakes occur with magnitudes between 1 and 2, most earthquakes with magnitudes between 0 and 4, with very small amount of earthquakes occurring with magnitudes outside of the range.
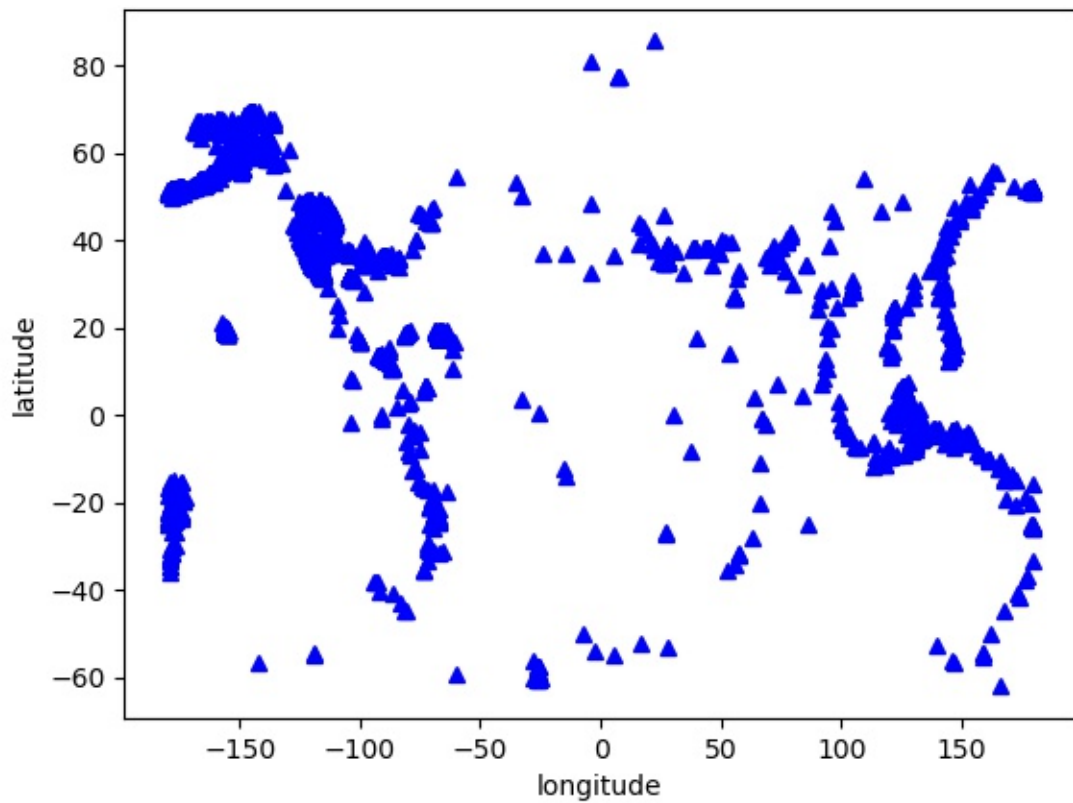
Figure 3. Location of earthquakes measured in the past 30 days around the world. This scatterpot shows that most earthquakes occur along major faultlines.
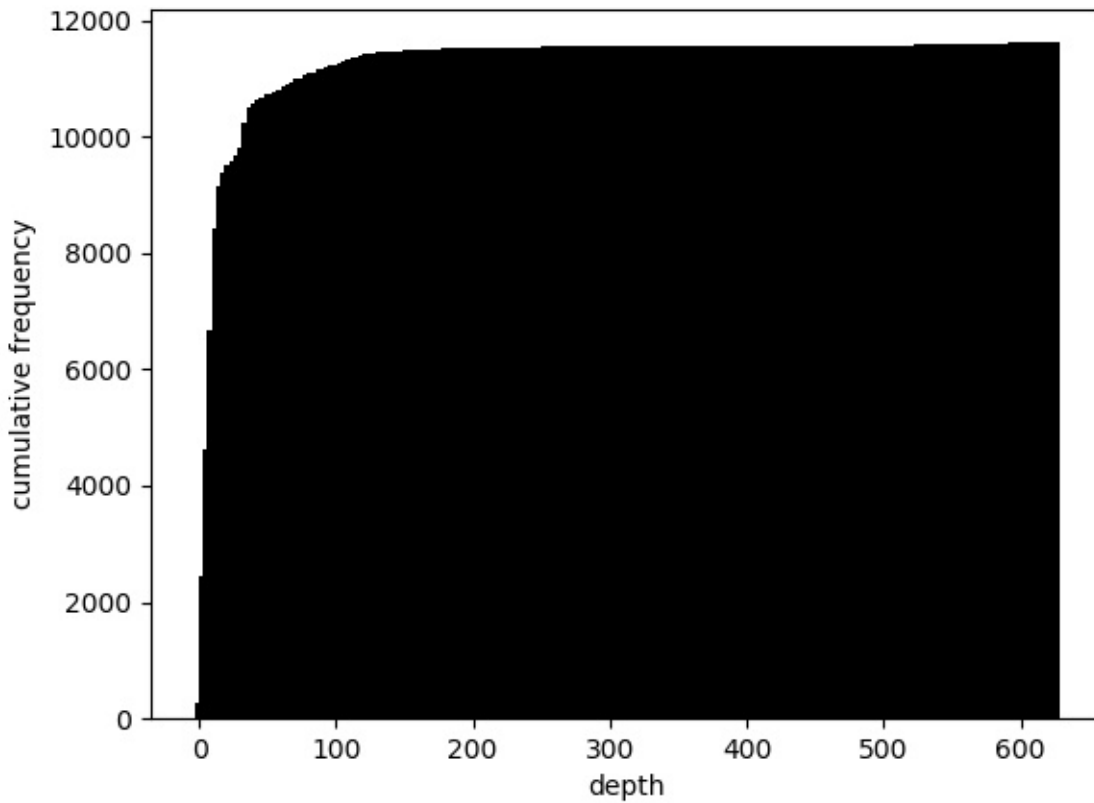
Figure 4. Cumulative distribution of earthquakes with depth. Most earthquakes occur at a depth of less than 100 units, with almost all earthquakes occuring at a depth of less than 200 units.
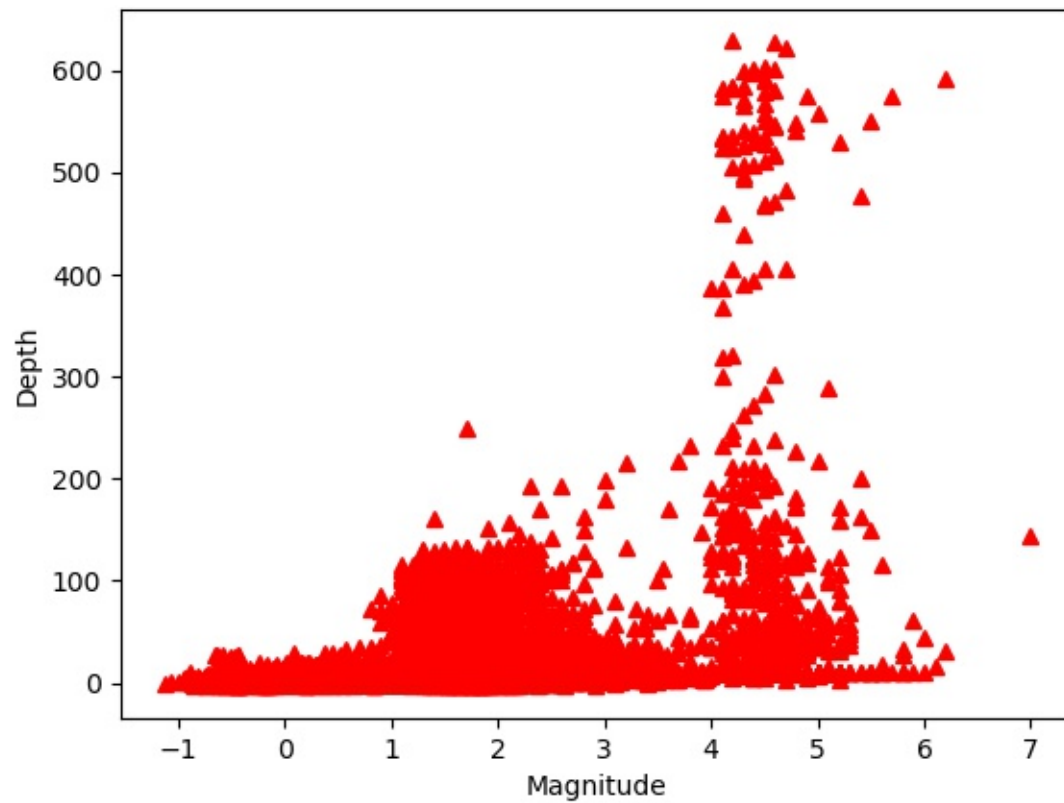
Figure 5. Scatterplot of magnitude (x-axis) vs depth (y-axis). For most magnitudes of an earthquake, the depth of the earthquake is below 150 units, with earthquakes with magnitudes under 1 consistently occurring shallower than the rest (0-50 units). However, earthquakes with magnitudes between 4 and 5 occur at all depths (0-600 units).
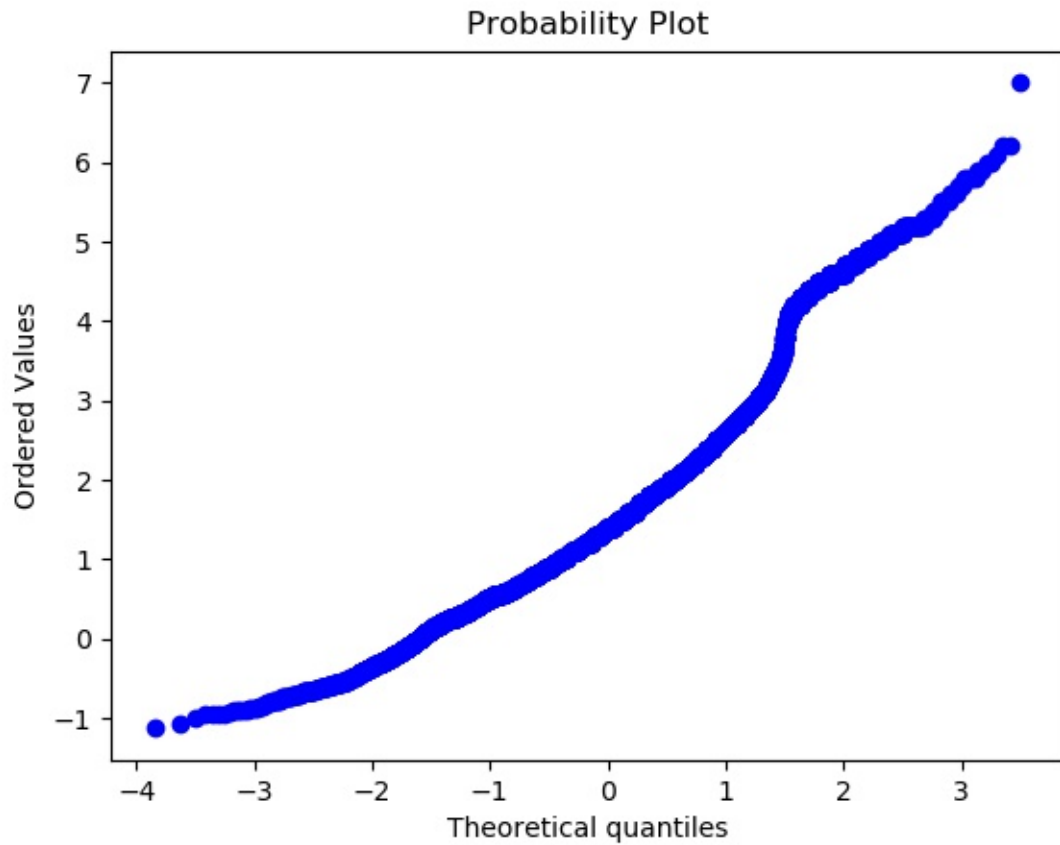
Figure 6. Q-Q plot of earthquake magnitudes. The data is a nearly linear relationship between the two axis, and thus it can be concluded that the earthquake magnitudes follow a normal distribution.