

## METADATA FILE

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### 1. Provenance of earthquake data

Data source: US Geological Survey (USGS)

URL: <https://earthquake.usgs.gov/earthquakes/feed/v1.0/csv.php>

Date and time downloaded: 5/1/2020 06:36:51.390Z (UTC)

Input file format: .csv file (comma delimited)

File contains the following columns:

time, latitude, longitude, depth, mag, magType, nst, gap, dmin, rms, net, id, updated, place, type, locationSource, magSource, horizontalError, depthError, magError, magNst, status

More info about each variable at: <https://earthquake.usgs.gov/earthquakes/feed/v1.0/csv.php>

2. `genfromtxt()` will not work because the input file is in .csv format and `genfromtxt()` cannot deal with .csv files.

### 3. Types of analysis and figures generated by the program

#### a. Plotting histogram of earthquake magnitude data (fig 1).

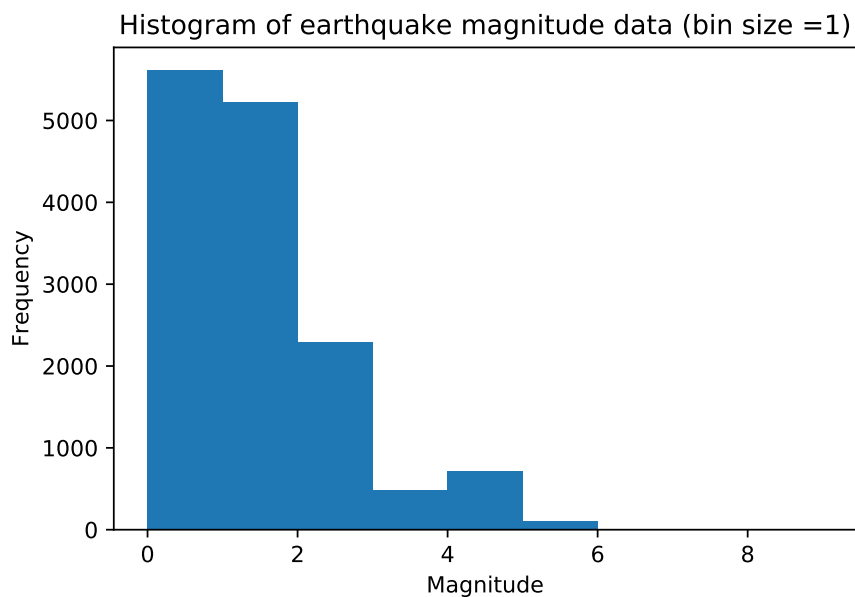


Fig 1: Histogram of magnitude data with bin size =1 and range = 1 to 8  
In this plot, a bin size of 1 is used. More the size, lesser the resolution of frequency data.

**b. Plotting KDE plot of earthquake magnitude (fig 2)**

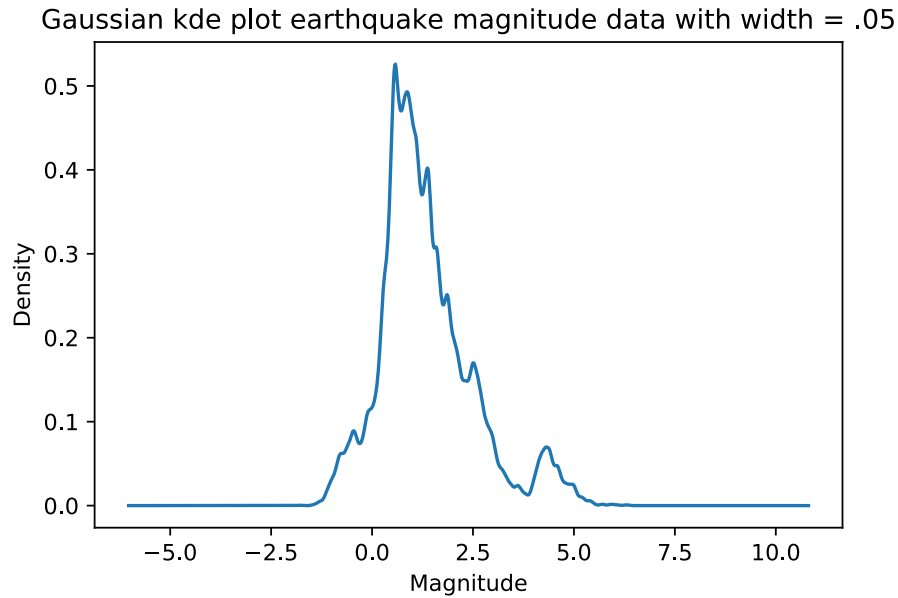


Fig 2: Gaussian type KDE plot for magnitude data with a width = 0.05  
In such kde plots, the smaller the width value, more rugged the graph becomes. Higher values will further smoothen the curve, but resolution is lost.

**c. Latitude versus longitude for all earthquakes (fig 3)**

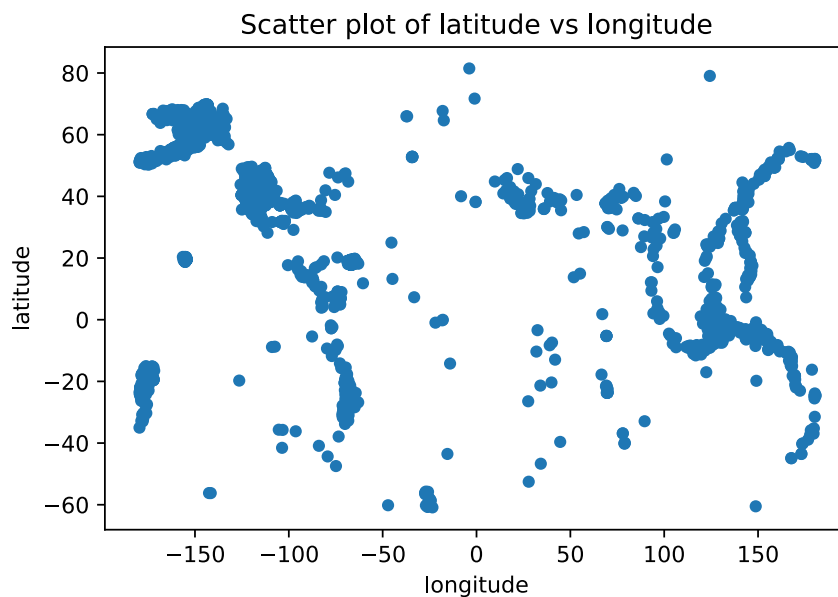


Fig 3: Scatter plot of latitude vs longitude of all the earthquake data.

According to the plot, there were fewer earthquakes around 0 degree longitude. Similar trend is not observed for latitude.

**d. Normalized CDF of earthquake depths (fig 4)**

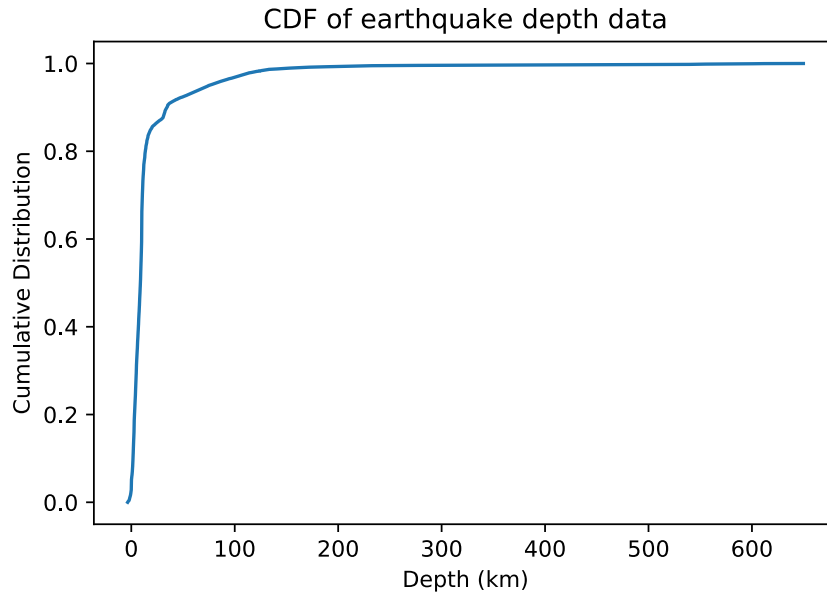


Fig 4: CDF of earthquake depths in kilo meters.

From the plot of CDF it can be said that most of the earthquakes' depth is < 100 km.

**e. Scatterplot of earthquake magnitude with depth (fig 5)**

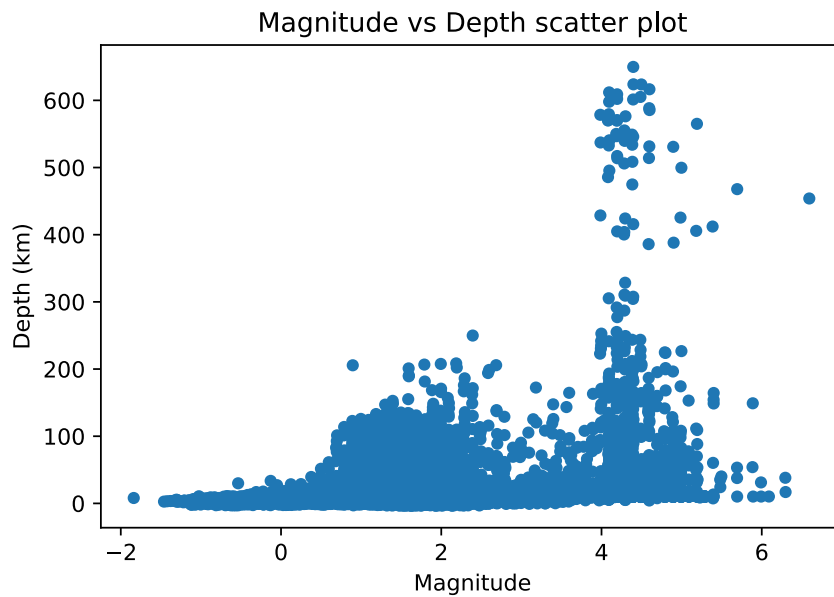


Fig 5: Scatter plot of magnitude with depth (km)

From the plot it can be said that large depths are usually associated with large magnitude earthquakes but not true vice-versa.

**f. Q-Q plot of earthquake magnitudes (fig 6)**

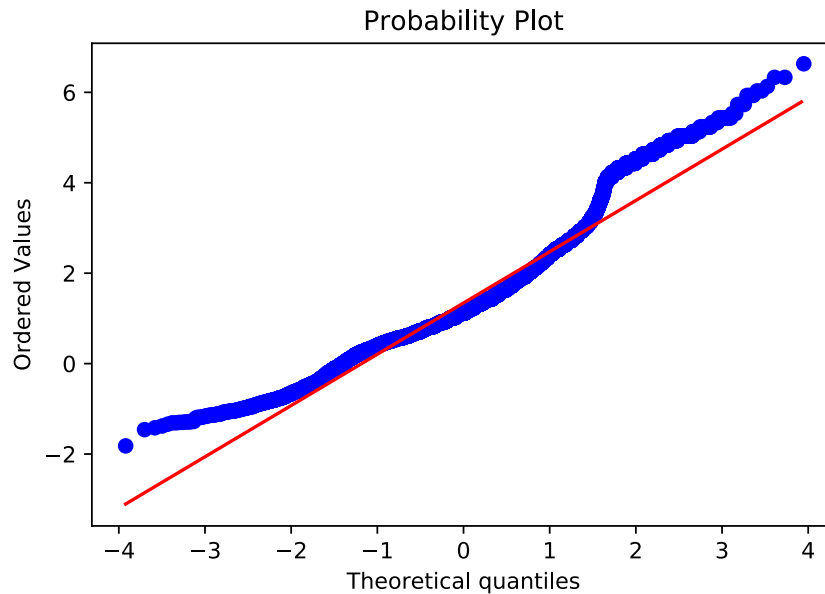


Fig 6: Q-Q plot of earthquake magnitudes with an assumption of normal distribution. From the plot, it can be said that the assumption holds true as the observed values shown by the blue line conform with the general trend of the theoretical red line.