

Project 3: Explore and Summarize Data

Due Date: May 25, 2015

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Data Info:

<http://earthquake.usgs.gov/earthquakes/search/>

<http://earthquake.usgs.gov/earthquakes/map/#%7B%22feed%22%3A%221430204253569%22%2C%22search%22%3A%7B%22id%22%3A%221430204253569%22%2C%22name%22%3A%22Search%20Results%22%2C%22isSearch%22%3Atrue%2C%22params%22%3A%7B%22starttime%22%3A%221850-01-01%2000%3A00%3A00%22%2C%22minmagnitude%22%3A7%2C%22endtime%22%3A%222015-04-27%2023%3A59%3A59%22%2C%22orderby%22%3A%22magnitude%22%7D%7D%2C%22listFormat%22%3A%22default%22%2C%22sort%22%3A%22largest%22%2C%22basemap%22%3A%22grayscale%22%2C%22autoUpdate%22%3Afalse%2C%22restrictListToMap%22%3Atrue%2C%22timeZone%22%3A%22utc%22%2C%22mapposition%22%3A%5B%5B-84.9901001802348%2C49.92187499999999%5D%2C%5B86.93226179333773%2C566.015625%5D%5D%2C%22overlays%22%3A%7B%22plates%22%3Atrue%7D%2C%22viewModes%22%3A%7B%22help%22%3Afalse%2C%22list%22%3Atrue%2C%22map%22%3Atrue%2C%22settings%22%3Afalse%7D%7D>

Earthquakes for Magnitude 7 and Higher Since 1900

Description

A dataset containing the earthquakes that is 7 and higher since year 1900 until 2015. The variables are as follows:

Usage

Data (ef)

Format

A data frame with 1318 rows and 16 variables when downloaded.

The added on Date variable includes 11 fields – Date, Year, Month, Day, Hour, long (modified longitude), long_class, lat_class, meg_class depth_class, decade.

Details

- Time - Time when the event occurred. Times are reported in *milliseconds* since the epoch (`1970-01-01T00:00:00.000Z`), and do not include leap seconds. In certain output formats, the date is formatted for readability. Data type – long integer
- Latitude – Decimal degrees latitude. Data type – decimal; Values - [-90.0, 90.0]
- Longitude - Decimal degrees longitude. Data type – decimal; Values - [-180.0, 180.0]
- Depth – depth of the earthquake in kilometers. Data type – decimal; Values – [0, 1000]
- Mag – the magnitude for the earthquake. Data type – decimal; Values - [-1.0, 10.0]
- magType – the method or algorithm used to calculate the preferred magnitude for the earthquake. Data type – string; Values – “Md”, “Ml”, “Ms”, “Mw”, “Me”, “Mi”, “Mb”, “MLg”

- nst – the total number of Number of seismic stations which reported P- and S-arrival times for this earthquake. Data type – integer.
- Gap - The largest azimuthal gap between azimuthally adjacent stations (in degrees). In general, the smaller this number, the more reliable is the calculated horizontal position of the earthquake. Data type – decimal; Values – [0.0, 180.0]
- dmin - Horizontal distance from the epicenter to the nearest station (in degrees). 1 degree is approximately 111.2 kilometers. In general, the smaller this number, the more reliable is the calculated depth of the earthquake. Data type – decimal; Values – [0.4, 7.1]
- rms – The root-mean-square (RMS) travel time residual, in sec, using all weights. This parameter provides a measure of the fit of the observed arrival times to the predicted arrival times for this location. Smaller numbers reflect a better fit of the data. The value is dependent on the accuracy of the velocity model used to compute the earthquake location, the quality weights assigned to the arrival time data, and the procedure used to locate the earthquake. Data type – decimal; Values – [0.13, 1.39]
- Net - the ID of a data contributor. Identifies the network considered to be the preferred source of information for the event. Data type – string; Values – ak, at, ci, hv, ld, mb, nc, nm, nn, pr, pt, se, us, uu, uw.
- Id - A unique identifier for the event. This is the current preferred id for the event, and may change over time. Data type – string; Values - A (generally) two-character network identifier with a (generally) eight-character network-assigned code.
- Updated - Time when the event was most recently updated. Times are reported in *milliseconds* since the epoch. In certain output formats, the date is formatted for readability. Data type – long integer
- Place - Textual description of named geographic region near to the event. This may be a city name, or a Flinn-Engdahl Region name. Data type – string.
- Date – the date portion that split from the time field. It splits to 3 variables fields.
- Year – integer value represents the year of event. Data type – integer; Values - [1900, 2015]
- Month - integer value represents the month of event. Data type – integer; Values - [1, 12] 1- January, 12 - December
- Day - integer value represent the day of event. Data type – integer; Values - [1, 31]
- Hour – integer value represent the Hour of event. Data type – integer; Values – [0, 23]
- depth_class - different zones of the depth of epicenter. The zones (except depth=0) according to USGS are defined:
 - depth = 0 -- character string - "surface"
 - 0 < depth < 70 -- character string - "shallow"
 - 70 <= depth <= 300 -- character string - "intermediate"

- depth > 300 -- character string - "deep"
- long - it is the another way to express of longitude that shows center of graph is 180 instead of 0
- mag_class - the class that show group of magnitude:
 - class 1 - magnitude < 7.5
 - class 2 - 7.5 <= magnitude < 8.0
 - class 3 - 8.0 <= magnitude < 8.5
 - class 4 - 8.5 <= magnitude < 9.0
 - class 5 - 9.0 <= magnitude < 9.5
 - class 6 - magnitude >= 9.5
- long_class - the class that show group of longitude
 - WestH - longitude > 180.0
 - Prime Meridian - longitude = 180.0
 - EastH - longitude < 180.0
- lat_class - the class that show group of latitude
 - NorthH - latitude > 90.0
 - Equator - latitude = 90.0
 - SouthH - latitude < 90.0
- Decade - for each 10 years in the Year field, it will determine which decade is. It range from 1900s all the way to 2010s.

Reference:

Glossary - Earthquake Catalog Data Terms

<http://earthquake.usgs.gov/earthquakes/feed/v1.0/glossary.php#rms>

Technical Terms used on Event Page

<http://earthquake.usgs.gov/earthquakes/eventpage/terms.php>

Spreadsheet Format

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

Richter magnitude scale

http://en.wikipedia.org/wiki/Richter_magnitude_scale

Ring of Fire

http://en.wikipedia.org/wiki/Ring_of_Fire

Global Earthquakes 1900 - 2013

http://earthquake.usgs.gov/earthquakes/world/seismicity_maps/world.pdf

Determining the Depth of an Earthquake

http://earthquake.usgs.gov/learn/topics/seismology/determining_depth.php

UTC-The World's Time Standard

<http://www.timeanddate.com/time/aboututc.html>