STEVENS INSTITUTE OF TECHNOLOGY

SYS-601 Homework #1

Due Jan. 29 2018

Submit the following using the online submission system: 1) Cover sheet with name, date, and collaborators, 2) Written responses in PDF format, 3) All work (e.g. .xlsx or .py files).

1.1 Plotting an Earthquake Dataset [20 points]

This problem works with a dataset for earthquakes observed between Jan. 1 2000 and Dec. 31 2016 within a 200 km radius of Wichita Falls, Texas and saved in the file `earthquakes.csv`.[1]

(a) 3 PTS From the data set, identify one of the columns conforming to each data type:

   (i) Nominal

   (ii) Interval

   (iii) Ratio

(b) 4 PTS Create a bar chart to show the frequency of earthquakes for each year 2000–2016. Label both axes.

(c) 4 PTS Create a histogram to show the number of earthquakes categorized by magnitude using an appropriate bin size. Label both axes.

(d) 4 PTS Create a plot to show the cumulative frequency of earthquakes by magnitude (i.e. number of earthquakes with magnitude below x). Label both axes.

(e) 4 PTS Create a scatter plot to show the longitude (x-axis) and latitude (y-axis) location of each earthquake. Label both axes.

(f) 1 PT Briefly describe any interesting or troubling trends you observe in this data set.

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[1]This data was gathered from the U.S. Geological Survey (USGS) using the following query: `http://earthquake.usgs.gov/fdsnws/event/1/query?format=csv&starttime=2000-01-01&endtime=2016-12-31&latitude=33.913392&longitude=-98.495779&maxradiuskm=200`