Homework 2 Due: 1/29, 2:00 pm

1. For the earthquake dataset "earthquakes.csv" (uploaded separately), write a Python program to find the followings:

   (1) Read this file and find top 10 worst earthquakes and save them to "top10-worst.txt" file. Note the larger the magnitude, the worse the earthquake. (40 points)
   (2) For the top 10 worst earthquakes, find the distance to TSU, and save the result to "dist-to-TSU.txt". (40 points)
   Hint:
   (i) TSU's latitude and longitude are 36.16963449238665, -86.82562299320742 (unit: degree).
   (ii) The distance between two points can be calculate by

$$d = acos(\sin(lat1) * \sin(lat2) + \cos(lat1) * \cos(lat2) * \cos(lon2 - lon1)) * 6371$$

   - *lat1, lon1 are the latitude and longitude of point 1, and lat2 and lon2 are the latitude and longitude of point 2, respectively.*
   - *The parameter for sin and cos function in Python is radian. 1 radian equals to* 57.296°.
   - 6371 is Earth radius in km.

2. Report writing. Refer to the "HowToWriteReport-A Sample.pdf" under eLearn, prepare your report following the requirements below. (10 points)
   (i) 12 point, Times New Roman, single space.
   (ii) Figures and screenshots must be readable.
   (iii) Screenshot containing partial source code and partial results can be inserted to the report. Do not use black background for screenshots which is hard to read.
   (iv) Full source code and experiment results need to be attached as appendices.