Homework #4

ErSE 253 – Data Analysis in Geosciences, Fall 2014

Due in class on Thursday, 2 October

Problem 1 (3 points)
Use the two variables from Homework 3 to estimate the global mean of the two datasets:

a) First provide the mean and standard deviation of variable T and P.
b) Now use cell declustering to calculate the global mean of the two variables. Use cell size of 2 km x 2 km.
c) Now systematically change the cell size from 0.5 km to 10 km and show the global mean estimate of P and T as a function of cell size. From these graphs, pick your global mean estimate for both T and P.

Problem 2 (4 points)
Now use the data from Homework 3 to estimate values of T and P at certain key locations, which requires point estimation

a) What are the estimated values of T and P at $(x_1, y_1)=(1,6)$ and $(x_2, y_2)=(6,4)$ using the polygonal, trinangulation and the inverse-distance methods? Explain your answer and how you choose what points are used in the estimation.
b) Now estimate T on a regular grid (grid spacing with 0.1 x 0.1 grid) using all the sample values, using either the triangulation or the inverse distance method. Display your result. Make sure to show axes values and colorbar

Problem 3 (3 points)
You throw a 4-sided die F and an 8-sided die E and then you add the two outcomes to form a new random variable A.

0.75 a) What are the possible outcomes of A and the corresponding probabilities?
0.75 b) If you know that e=6, what is the probability of f=3?
0.75 c) What is the expected value and standard deviation of A?
0.75 d) What is the marginal probability that a=7 for a joint variable (F,A)?