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STAT 333: Uncertainty in Engineering and Science (2017): Project 2, due Tue, Feb 28

1 message

Wojbor A Woyczynski - wojbor.woyczynski@case.edu <do-not-reply@blackboard.com> Thu, Feb 16, 2017 at 10:21 AM
Reply-To: "Wojbor A Woyczynski - wojbor.woyczynski@case.edu" <wojbor.woyczynski@case.edu>

Hi

This is Project 2, due Tuesday, Feb 28, at class time. The project is individual and is tio be delivered as a SINGLE !!!! Mathematica Notebook to myself via email. Please, clearly indicate in the email headline that this is Project 2 for STAT 333/433. Download the following data sets:

drips.nb, resistor.nb , hospheart.nb

from http://www.springer.com/ birkhauser/applied+ probability+and+statistics/ book/978-0-8176-4031-6

or from my website.

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Problem 1 (40 pts): (a) Calculate means, variances, medians, and quartiles, for the above data (M and V in the case of hosphert.nb).

Write your own Mathematica code for these functions.

(b) Produce histograms for them using two different bin sizes for each.

(c) Produce plots of quantile functions, moment functions and CDFs for them (write your own Mathematica code for moments and CDFs)

(d) Produce box-and-whiskers plots and QQ plots comparing distributions of (centered- subtract the means) drips and resistor data.

Comment on the results of the comparison.

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Problem 2 (30 pts) . (a) Calculate the correlation coefficient between the volume V and mortality M of the heart transplants based on the data in

hosphert.nb

Produce the scatter plot of the data and superimpose the regression line on them. Write your own code for this part. What are your conclusions?

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Problem 3. Entropy olympics (20 pts) . Select (long) texts in three different languages (for example, English, French and Italian). Calculate the entropy for each and compare them, draw your conclusions.

Problem 4. Carpet fractality (10 pts) . Calculate the fractional dimension of the Sierpinski carpet and "sponge".

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