Assignment-4 DLS Method

This file contains data on ODI matches from 1999 to 2011. It is taken from this site. There is an R code for finding the 'run production functions' in this site, but you will do something marginally different in the following assignment.

Discussion is encouraged. But write your own code. Please comply with the ethics policy. You must sign the submission statement and click the submit button to submit your work.

Using the first innings data alone in the above data set, find the best fit 'run production functions' in terms of wickets-in-hand w and overs-to-go u. Assume the model:

$Z(u, w) = Z_0(w)[1 - \exp\{-L(w)u/Z_0(w)\}]$.

Denoting y' to be the model prediction and y to be the actual runs scored, use the following loss function

$loss(y', y) = (y'+1) \log((y'+1)/(y+1)) - y' + y,$

summed across overs, wickets, and the data points for those overs and wickets, then normalised by the total number of points. Note that your regression does not force all the slopes to be equal at $u = 0$.

Then set the common slope L to be the weighted average of the above-obtained slopes $L(w)$, with the weight for a particular $L(w)$ coming from the number of points for that w.

With the above L, re-do the regression to get the best fit $Z_0(w)$ for each w.

You pdf file should provide a plot of the 10 preliminary run-production functions, report the 20 parameters associated with them, plot of the 10 final run-production functions, report the 11 parameters associated them, and report the normalised loss (summed across overs, wickets, and data points for those overs and wickets, and normalised by the total number of data points across all overs and wickets).

Feel free to use tools for nonlinear regression available in Python. Some date fields are in a different format with an extra comma. Write a short script to clean this up. This clean-up code should be a part of the main program. You may create a temporary data file, but remove the temporary data file after the output data has been generated.

Follow the submission assignment submission rules without fail. Ensure that you upload the assignment, accept the submission statement, and click the submit button. Please check and double-check before submitting. Submission is like dropping a letter into a postbox - once submitted, it's submitted, and on its way.