STA6703 SML HW9

Directions

Please submit **ONE PDF** file including all your reports (answer + code + figures + comments; must be easily readable and have file size under a few megabytes) and **ONE R code script**. The R script is supplementary material to ensure that your code runs correctly. If you are using RMarkdown, please also include your `.Rmd` file. If using Python, please submit the Python notebook/script in lieu of the R script.

Place these two (or three) files in a folder, make a zip or rar archive, and submit the archive electronically via Dropbox file request at `tinyurl.com/nbliznyuk-submit-files` (on the landing page, enter your name so that we know it is you and email so that you get a confirmation).

Please **submit only ONE solution** on behalf of the entire work group, **NOT separate/individual solutions** by different group members. You can have multiple submissions, in which case only the most recent will be graded.

Deadline: 29-Nov-2022 (soft deadline); 01-Dec-2022 (hard deadline), 10:00 PM EST.

Practice/Optional Problems (do not submit)

1. Complete the R tutorial for the ISLR chapters 9 and 10. You may find the Youtube videos by Trevor Hastie helpful; for links, see file `!_youtube_lab_links.txt` in the subfolder `"[2].code/islr_labs/"`
2. ISLR ch.09: 1
3. ISLR ch.10: 8
4. Optional typed problems:
   (a) In Lab 9.6.3, try to reproduce ROC curves by hand by varying the threshold t in the classification boundary f(x)=t. Plot the true positive (TP) rate vs t, false positive (FP) rate vs t, and TP(t) vs FP(t).
   (b) In the USArrests data, use the R function svd() to recover the output of princomp (PC sdev, scores and loadings) as discussed in the PCA lecture
   (c) Watch a Youtube video below about "eigenfaces" for an intuitive application of PCA to face recognition:

   `https://www.youtube.com/watch?v=jQOZrXZTXcw`

   `https://www.youtube.com/watch?v=_lY74pXWlS8`

Required Problems (for submission)

ISLR ch.09: 2,3,5,8

ISLR ch.10: 3,9,10