STATS 205: Homework Assignment 5 (Spring 2019)

5/13/2019

Solve problems 2-7 from the textbook *HWC* available here.

Send your Rmd and PDF files to pjeganat [at] stanford [dot] edu.

Due on 5/20/2019 (Monday) at 1.30 p.m.

1) "Permutation, parametric and bootstrap tests of hypotheses by Good 2005" (Exercise 4.8, #20, page 78) link here to the textbook. Suppose the observations $(X_1, \cdots, X_K)$ are distributed in accordance with the multivariate normal probability density

$$\frac{\sqrt{|D|}}{(2\pi)^{K/2}} \exp\left[-\frac{1}{2}\sum\sum d_{ij}\left(x_i-\mu_i\right)\left(x_j-\mu_j\right)\right],$$

where the matrix $D = (d_{ij})$ is positive definite; $|D|$ denotes its determinant; $\mathbb{E}\left(X_j\right) = \mu_j$; $\mathbb{E}\left(x_i-\mu_i\right)\left(x_j-\mu_j\right) = \sigma_{ij}$; and $\sigma_{ij} = \left(D^{-1}\right)_{ij}$, i,j-th element of inverse of D. If $\sigma_{ii} = \sigma^2$ when $i = j$ and $\sigma_{ij} = \sigma_{12}$, $\forall i, j$, are the observations independent? exchangeable?

2) **HWC** Page 409, Problem 1 (Kendall test).

3) **HWC** Page 414, Problem 20 (Kendall's sample correlation coefficient)

4) **HWC** Page 427, Problem 34 (Kendall correlation coefficient confidence interval) do not need to compare the results with Problem 28.

5) **HWC** Page 440, Problem 41 (Spearman test).

6) **HWC** Page 457, Problem 1 (test for slope).

7) **HWC** Page 485, Problem 33 (rank-based multiple linear regression).