STAT 345-01: Nonparametric Statistics

Problem Set 5

Assigned 2018 October 2
Due 2018 October 16

Show your work on all problems! Be sure to give credit to any collaborators, or outside sources used in solving the problems. Note that if using an outside source to do a calculation, you should use it as a reference for the method, and actually carry out the calculation yourself; it's not sufficient to quote the results of a calculation contained in an outside source.

Please hand in parts one and two separately.

1 Part One

1.1 Conover Problems on Kruskal-Wallis Tests

Exercise 5.2.2 [Calculate a p-value.]

Exercise 5.2.6

Problem 5.2.2 [Also compare with the normal approximation.]

1.2 Conover Problems on Relative Efficiency

Exercise 2.4.2

Followup: In the previous problem, for each of the following critical regions, calculate α and $\gamma(0.25)$:

(a) $X \in \{0, 1, 2, 3, 4, 5, 6, 7, 8\}$
(b) $X \in \{0, 1, 2, 3, 5, 6, 7, 8\}$
(c) $X \in \{0, 1, 2, 6, 7, 8\}$
(d) $X \in \{0, 1, 7, 8\}$
(e) $X \in \{0, 8\}$
(f) $X \in \{\emptyset\}$ (i.e., never reject H_0)

Use the results to plot the ROC curve for this family of tests when the alternative hypothesis is $p = 0.25$.

Problem 2.4.1

2 Part Two

Download the ipython/jupyter notebook
`http://ccrg.rit.edu/~whelan/courses/2018_3fa_STAT_345/data/ps05.ipynb`
using the username and password given in class, and carry out the exercises, evaluating the cells and adding commands as necessary to complete the problem according to the instructions. Submit your completed notebook as a hardcopy, or via email (either the final `.ipynb` file or a pdf, which can be created using nbconvert).