

GB704 - Homework 2
Due : October 5, 2017

Problem 1 (40pts)

Consider the following probability space and random variable.

S	s_1	s_2	s_3
p	0.05	0.55	0.40
X	90	100	110

1. Find a random variable Y whose coefficient of correlation with X is roughly 0.5.
2. Download data2D2D2017.xlsx from my webpage. Design and perform a Chi-squared test that provides strong evidence that these data are **NOT** random draws from X . Report the chisquare distance (the value of the chisquare statistics) as part of your answer, not just the p-value.

Problem 2 (40pts)

Download dataset data1D2D2017.xlsx from my webpage.

1. Test the hypothesis that mean spending is the same for men and for women.
2. Consider the following spending categories: < 100 , $[100, 200)$, $[200, 300)$, $[300 - 400)$, ≥ 400 . Create a table that shows the number of observations in each of those spending categories for men and for women.
3. Use that table to perform a Chi2 test of the hypothesis that spending is independent of gender.

Problem 3 (20pts)

Use those same data to test the two-sided hypothesis that the median spending of our customers is 100 dollars per year. Compute the associated p value.