**HW 4 (Due Monday, July 18th by 6:00 PM)**

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Complete the following nine questions from the course textbook.

Chapter 5: Exercises 5, 7, 9, and 12.



Conclusion: p-value = 0.07736 , Not enough evidence to conclude a significant correlation between moisture and shrew abundance with Spearman’s rank correlation rho.



Conclusion: p-value = 0.05746 , Not enough evidence to conclude a significant correlation between moisture and shrew abundance with Kendall’s rank correlation tau.

Chapter 5.Ex7

Ho: No association between contamination and distance.

Ha: Existing association.



Conclusion: Fisher’s Exact Test with p-value = 0.0625 does not reject null hypothesis at α = 0.05 significant level.

Ch5.Ex9

1. Test for association between the two factors using permutation chi-square test.

Ho: no association

Ha: present association



Conclusion: p-value = 0.106 and in our case we fail to reject Ho at α = 0.05 significant level.

1. Test for association using Kruskal-Wallis test with ties.

Ho: all equal

Ha: at least one is not equal.



Conclusion: p-value is smaller comparing with the permutation chi-square test. And we reject Ho at α = 0.05 significant level.

1. Test for association using the Jonckheere-Terpstra statistic with ties.



Conclusion: looking at our Jonckheere-Terpstra test statistic we do observe that with two.sided and also with decreasing alternative hypothesis p-values are in both cases smaller comparing with a. and b. as we considered both grades and CT scores as ordered factors.

Chapter 5. Ex12

Ho: making a shot on the first attempt is independent form probability of making a shot on the second attempt at .05 significance level.

Ha: not independent.

1. McNemar’s test



Conclusion: We do not reject Ho As the p-value= 0.06646 is greater that the α = 0.05 significant level

1. Pearson’s Chi-squared



Conclusion: As the p-value= 0.4192 is greater that the α = 0.05 significant level, we do not reject null hypothesis that making a shot on the first attempt is independent form probability of making a shot on the second attempt at .05 significance level. Comparing with McNemar’s Chi-squared test we do see that Pearson’s Chi-squared test is largest considerably but both test does fail to reject null hypothesis.

Chapter 8: Exercises 1, 2, 5, 8, and 11.

Ch8Ex1

MSE, Standar eoor and margin of error for sample mean, the sample standard deviation and the coeficient of variations.





Ch8Ex2

BCA method to make 95% CI:



t-pivot method to make 95% CI:



Ch8Ex5





Conclusion: A BCA 90% CI for the slope is (3.091, 14.200 )of the regression line by using 10000 bootstrap samples

Ch8Ex8



Conclusion: A 90% CI for the difference in means of the populations (rural, urban) is (-0.375, 1.434) using BCA. Since interval contains 0, not significant difference in our samples.



Conclusion: A 90% CI for the difference in means of the populations (rural, urban) is (-0.4012, 1.513). Since our interval contains 0, not significant difference in our samples. Not enough evidence to reject null hypothesis.

Ch8Ex11

1. boot.datos <- boot(d811,beta.funcs,R=10000)

boot.datos

### Check if FH has nonzero slope

boot.ci(boot.datos,index=1)

## check if MH has nonzero slope

boot.ci(boot.datos,index=2)

### not required, but this tests if beta\_FH=beta\_MH because

### it evaluates to beta\_FH-beta\_MH

boot.ci(boot.datos,index=3)





Conclusion: A BCA 95% CI for Beta1 is (0.0113, 0.5615 ) by using 10000 bootstrap samples.



Conclusion: A BCA 95% CI for Beta2 is (0.1913, 0.5867 ) by using 10000 bootstrap samples.



Conclusion: A BCA 95% CI for Beta2 is (-0.4826, 0.2639 ) by using 10000 bootstrap samples.

Mothers and Fathers heights both are significant but difference is not significant.

1. β1, β2. CI 95%.





Conclusion: calculated CI using raw residuals is: (0.02657197, 0.52188791). CI using corrected residuals is: (0.03930949, 0.52355957)