Problem Set - 5 (Two Sample Tests and ANOVA)

ECO 204 (Section 7)
Instructor: Shaikh Tanvir Hossain
TA: Habiba Afroz

Due: No Need to Submit

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1. Suppose we collected following data on ECO101 - marks (out of 100) from three different groups of students at EWU, in particular BBA, ECONOMICS and CSE students

BBA	ECONOMICS	CSE
82	71	64
93	62	73
61	85	87
74	94	91
69		56

   (a) Assuming **population variances are equal**, do the following tests. Use 5% significance level. Clearly state your null and alternative hypothesis, write down the ANOVA table, degrees of freedom, test statistic, critical value, pulled variance and conclusion.
      i. Test whether there is any significant difference in the mean marks of BBA and CSE students.
      ii. Test whether there is any significant difference in the mean of ECONOMICS and CSE students.
      iii. Test whether the mean of BBA students is significantly greater than the mean of ECONOMICS students.
      iv. Test whether the mean of ECONOMICS students is significantly less than the mean of CSE students.

   (b) Do the same tests from the last question but now assuming **population variances are unequal**. Use 5% significance level. Clearly state your null and alternative hypothesis, write down the ANOVA table, degrees of freedom, test statistic, critical value, and conclusion.

   (c) Do the test in (a - i) using Dummy variable regression approach. Use 5% significance level. Clearly state your null and alternative hypothesis, write down the regression output, test statistic, critical value, and conclusion (Note that in this case when we assume Homoskedasticity, it is same as equal variance assumption).

2. Now use the same data as in question 1, but now do test whether mean marks of BBA, ECONOMICS and CSE students are all equal using One-Way ANOVA. Use 1% significance level. Clearly state your null and alternative hypothesis, write down the ANOVA table, degrees of freedom, test statistic, critical value, p-value and conclusion (**Note:** You should be able to do the test without using Excel if you have Sum of Squares).

3. Do the same test in Question 2 using Dummy variable regression approach. Use 1% significance level. Clearly state your null and alternative hypothesis, write down the regression output, test statistic, critical value, p-value and conclusion.

Apology Note: Sorry we could not do Two-Way ANOVA in the class due to time constraint, but you can try to learn it by yourself from the book or online resources.