MTH 3240 Lab 9 **Answer Sheet**

Due Thu., Apr. 23

1 Part A

1.1 Macroinvertebrates Data Set

1. NA
2. NA
3.
   - Using a level of significance $\alpha = 0.05$, does the effect of **season**, if any, depend on the **stream** (Yes/No)? _____

     Hint: Please use the correct **p-value** (and **test statistic**) from the correct row of the ANOVA table.

     Give the **test statistic** value and the **p-value** for the test used answer this question:

     F statistic = _____

     P-value = _____

   - If the **interaction** effect is **significant**, then **both factors** have effects, regardless of the **p-values** (and **test statistics**) from their rows of the ANOVA table. If it's **not significant**, then each factor only has an effect if its **p-value** is below 0.05.

     Using a level of significance $\alpha = 0.05$, does **season** have an effect on the macroinvertebrate ratio (Yes/No)? _____

     Give the **test statistic** value and the **p-value** for the test used answer this question:

     F statistic = _____

     P-value = _____

   - Using a level of significance $\alpha = 0.05$, does **stream** have any effect on the macroinvertebrate ratio (Yes/No)? _____

     Give the **test statistic** value and the **p-value** for the test used answer this question:

     F statistic = _____

     P-value = _____

4. **Don't** print the interaction plot. Just answer the following question.

   Based on the plot, describe the nature of the interaction effect – how is does the effect of season differ for the three streams?

5. **Don't** print the normal probability plot. Just answer the following question.

   Based on the plot, does the normality assumption for the two-factor ANOVA F tests appear to be met (Yes/No)? _____

6. **Don't** print the plot of the residuals versus the fitted values. Just answer the following question.

   The **equal standard deviation assumption** is met if there's no funnel shape (increasing spread from left to right) in the plot. Based on the plot, does the equal standard deviation assumption for the two-factor ANOVA F tests appear to be met (Yes/No)? _____

2 Part B

2.1 Prince William Sound Hydrocarbons Data Set

1. NA
2. NA
3. - Using a level of significance $\alpha = 0.05$, does the effect of **month**, if any, **differ** depending on the **station** (Yes/No)? _____

     Hint: Please use the correct **p-value** (and **test statistic**) from the correct row of the ANOVA table.

     Give the **test statistic** value and the **p-value** for the test used answer this question:

     F statistic = _____

     P-value = _____

- If the **interaction** effect is **significant**, then **both factors** have effects, regardless of the **p-values** (and **test statistics**) from their rows of the ANOVA table. If it's **not significant**, then each factor only has an effect if its **p-value** is below 0.05.

  Using a level of significance $\alpha = 0.05$, does **station** have an effect on the pristane concentration (Yes/No)? _____

  Give the **test statistic** value and the **p-value** for the test used answer this question:

  F statistic = _____

  P-value = _____

- Using a level of significance $\alpha = 0.05$, does **month** have any effect on the pristane concentration (Yes/No)? _____

  Give the **test statistic** value and the **p-value** for the test used answer this question:

  F statistic = _____

  P-value = _____

4. **Don't** print the interaction plot. Just answer the following question.

   Based on the plot, describe the nature of the interaction effect – how is does the effect of **month** differ for the seven **stations**?