

MTH 3240 Lab 10 Answer Sheet

Due Thu., Apr. 30

1 Part A

1.1 Rome Ammonia Data Set (Number One)

1. NA
2. *Don't* print the plot. Just answer the following question.

Describe the **relationship** between **NH₃** and **CO** (Positive or Negative? Linear or Curved?)

3. The value of the **correlation** is $r =$ _____

Using the criteria below, **how strong** is the relationship between **ammonia** and **carbon monoxide** (Weak, Moderate, or Strong)? _____

Correlation r	Strength of Relationship
0.0 to 0.5	Weak
0.5 to 0.8	Moderate
0.8 to 1.0	Strong

1.2 Rome Ammonia Data Set (Number Two)

1. NA
2. *Don't* print the plot. Just answer the following question.

Describe the **relationship** between the **NH₃** to **CO** ratio and **temperature** (Positive or Negative? Linear or Curved?)

3. The value of the **correlation** is $r =$ _____

Using the criteria in **Step 3** of the previous section, **how strong** is the relationship between the **ratio** of **ammonia** to **carbon monoxide** and **temperature** (Weak, Moderate, or Strong)? _____

2 Part B

2.1 Yellowstone Lake Data Set (Outflow)

1. NA
2. NA
3. NA
4. *Don't* print the plot. Just answer the following question.

Based on the plot, does it appear that there's been a **trend** in Yellowstone Lake's **outflow** over the **years**? If so, is it an **increasing** or **decreasing** trend?

5. Give the following values from the output of `summary()`:

The **Y-intercept** of the fitted trend line is (Estimate in the (Intercept) row)

$b_0 =$ _____

The **slope** of the trend line is (Estimate in the Year row) $b_1 =$ _____

For the **t test** of

$H_0 : \beta_1 = 0$ (There's **no trend** in the lake's outflow)

$H_a : \beta_1 \neq 0$ (There **is a trend** in the lake's outflow)

The **test statistic** value is (t value in the Year row) $t =$ _____

The **p-value** ($\Pr(>|t|)$ in the Year row) is _____

Using level of significance $\alpha = 0.05$, is there **statistically significant** evidence for a **trend** (i.e. does the slope b_1 differ significantly from zero) (Yes/No)?

The R^2 value (Multiple R-squared) is $R^2 =$ _____

2.2 Yellowstone Lake Data Set (Cont'd, trend in Elevation)

1. NA
2. NA
3. *Don't* print the plot. Just answer the following question.

Based on the plot, does it appear that there's been a **trend** in Yellowstone Lake's **elevation** over the **years**? If so, is it an **increasing** or **decreasing** trend?

4. Give the following values from the output of `summary()`:

The **Y-intercept** of the fitted trend line is (Estimate in the (Intercept) row)

$b_0 =$ _____

The **slope** of the trend line is (Estimate in the Year row) $b_1 =$ _____

For the **t test** of

$H_0 : \beta_1 = 0$ (There's **no trend** in the lake's elevation)

$H_a : \beta_1 \neq 0$ (There **is a trend** in the lake's elevation)

The **test statistic** value is (t value in the Year row) $t =$ _____

The **p-value** ($\Pr(>|t|)$ in the Year row) is _____

Using level of significance $\alpha = 0.05$, is there **statistically significant** evidence for a **trend** (i.e. does the slope b_1 differ significantly from zero) (Yes/No)?

The R^2 value (Multiple R-squared) is $R^2 =$ _____