**Experiment 17**: Statistical Analysis

(Edit this document as needed)

Partner 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Part A*

Statistical results of resistor analysis data

|  |  |
| --- | --- |
| Mean |  |
| Median |  |
| Standard Deviation |  |

Possible sources of error during experiment?

Is the standard deviation with the range expected by the tolerance?

Histogram plot with outlier data point.

Statistical results of resistor analysis data, without outlier point

|  |  |
| --- | --- |
| Mean |  |
| Median |  |
| Standard Deviation |  |

What changes do you notice in the statistical characteristics?

What type of distribution do you think the histogram represents?

Histogram plots with different bin sizes.

Do you think the type of distribution changed?

*Part B*

Correlation coefficient for data set (2,1),(3,2),(4,3)

|  |  |
| --- | --- |
| Correlation Coefficient |  |

Correlation coefficient for data set (1,1),(3,3),(5,2)

|  |  |
| --- | --- |
| Correlation Coefficient |  |

Correlation coefficient for experiment 5 data

|  |  |
| --- | --- |
| Correlation Coefficient |  |

Based on the correlation coefficient, is the data linear?

Correlation coefficient for experiment 11, Part C data

|  |  |
| --- | --- |
| Correlation Coefficient |  |

Based on the correlation coefficient, is the data linear?

Correlation coefficient for experiment 17, Part F data

|  |  |
| --- | --- |
| Correlation Coefficient |  |

Based on the correlation coefficient, is the data linear?

*Part C*

Current measurements,

|  |  |
| --- | --- |
| V1 = 2.0V, V2 = 2.0V | [mA] |
| V1 = 2.0V, V2 = 2.5V | [mA] |

Transpose of matrix A

Multiplication of 

Inverse of 

Multiplication of 

Linear Coefficients

|  |  |
| --- | --- |
| a |  |
| b |  |

Estimate of current when V1 = V2 = 2.5V

Current measurements,

|  |  |
| --- | --- |
| V1 = 2.0V, V2 = 2.0V | [mA] |
| V1 = 2.0V, V2 = 2.5V | [mA] |
| V1= V2 = | [mA] |
| V1= V2 = | [mA] |

Transpose of matrix A

Multiplication of 

Inverse of 

Multiplication of 

Linear Coefficients

|  |  |
| --- | --- |
| a |  |
| b |  |

Estimate of current when V1 = V2 = 2.5V

Current measurements,

|  |  |
| --- | --- |
| V1 = 2.0V, V2 = 2.0V | [mA] |
| V1 = 2.0V, V2 = 2.5V | [mA] |
| V1= V2 = | [mA] |
| V1= V2 = | [mA] |
| V1= V2 = | [mA] |
| V1= V2 = | [mA] |
| V1= V2 = | [mA] |
| V1= V2 = | [mA] |

Transpose of matrix A

Multiplication of 

Inverse of 

Multiplication of 

Linear Coefficients

|  |  |
| --- | --- |
| a |  |
| b |  |

Estimate of current when V1 = V2 = 2.5V

Is the prediction of the linear fit improving with data?

Due: March 24th, 2022 at 11:59 pm eastern on Gradescope

One student submits on Gradescope and adds their partner using “add group members” option on Gradescope.