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STAT1221

Homework #2

MINITAB Output

1c)

Regression Analysis: Dry Weight versus Age

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 1 | 6.079 | 6.0785 | 26.18 | 0.001 |
| Age | 1 | 6.079 | 6.0785 | 26.18 | 0.001 |
| Error | 9 | 2.090 | 0.2322 |  |  |
| Total | 10 | 8.168 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 0.481848 | 74.42% | 71.58% | 54.56% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -1.885 | 0.526 | -3.58 | 0.006 |  |
| Age | 0.2351 | 0.0459 | 5.12 | 0.001 | 1.00 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| Dry Weight | = | -1.885 + 0.2351 Age |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Obs | Dry Weight | Fit | Resid | Std Resid |  |
| 11 | 2.812 | 1.877 | 0.935 | 2.35 | R |

*R  Large residual*

Regression Analysis: Dry Weight Log versus Age

The regression equation is  
Dry Weight Log = - 2.689 + 0.1959 Age

Model Summary

|  |  |  |
| --- | --- | --- |
| S | R-sq | R-sq(adj) |
| 0.0280741 | 99.83% | 99.81% |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P |
| Regression | 1 | 4.22106 | 4.22106 | 5355.60 | 0.000 |
| Error | 9 | 0.00709 | 0.00079 |  |  |
| Total | 10 | 4.22815 |  |  |  |
| 1d) |  |  |  |  |  |





1f)



2b 1)

Regression Analysis: SBP versus QUET

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 1 | 3538 | 3537.95 | 36.75 | 0.000 |
| QUET | 1 | 3538 | 3537.95 | 36.75 | 0.000 |
| Error | 30 | 2888 | 96.27 |  |  |
| Total | 31 | 6426 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 9.81160 | 55.06% | 53.56% | 45.90% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | 70.6 | 12.3 | 5.73 | 0.000 |  |
| QUET | 21.49 | 3.55 | 6.06 | 0.000 | 1.00 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| SBP | = | 70.6 + 21.49 QUET |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Obs | SBP | Fit | Resid | Std Resid |  |  |
| 9 | 144.00 | 121.47 | 22.53 | 2.54 | R |  |
| 10 | 180.00 | 170.23 | 9.77 | 1.13 |  | X |
| 12 | 138.00 | 157.23 | -19.23 | -2.04 | R |  |

*R  Large residual  
X  Unusual X*

5a)



7a)





Regression Analysis: DIST versus MPH

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 1 | 173474 | 173474 | 173.18 | 0.000 |
| MPH | 1 | 173474 | 173474 | 173.18 | 0.000 |
| Error | 17 | 17029 | 1002 |  |  |
| Lack-of-Fit | 13 | 13595 | 1046 | 1.22 | 0.465 |
| Pure Error | 4 | 3434 | 858 |  |  |
| Total | 18 | 190503 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 31.6495 | 91.06% | 90.54% | 88.33% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -122.3 | 20.2 | -6.07 | 0.000 |  |
| MPH | 6.227 | 0.473 | 13.16 | 0.000 | 1.00 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| DIST | = | -122.3 + 6.227 MPH |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Obs | DIST | Fit | Resid | Std Resid |  |
| 3 | 337.6 | 251.3 | 86.3 | 2.95 | R |

*R  Large residual*

Regression Analysis: SQRT(DIST) versus MPH

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 1 | 399.351 | 399.351 | 607.22 | 0.000 |
| MPH | 1 | 399.351 | 399.351 | 607.22 | 0.000 |
| Error | 17 | 11.180 | 0.658 |  |  |
| Lack-of-Fit | 13 | 8.169 | 0.628 | 0.83 | 0.642 |
| Pure Error | 4 | 3.012 | 0.753 |  |  |
| Total | 18 | 410.531 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 0.810967 | 97.28% | 97.12% | 96.49% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -1.697 | 0.516 | -3.29 | 0.004 |  |
| MPH | 0.2988 | 0.0121 | 24.64 | 0.000 | 1.00 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| SQRT(DIST) | = | -1.697 + 0.2988 MPH |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Obs | SQRT(DIST) | Fit | Resid | Std Resid |  |
| 3 | 18.370 | 16.229 | 2.141 | 2.85 | R |

*R  Large residual*