James Hahn

STAT1221

Homework #5

MINITAB Output

**Chapter 9**

**7a)**

Regression Analysis: Y versus X1, X2, X3

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 3 | 1518.14 | 506.05 | 24.02 | 0.000 |
| X1 | 1 | 30.29 | 30.29 | 1.44 | 0.248 |
| X2 | 1 | 94.91 | 94.91 | 4.51 | 0.050 |
| X3 | 1 | 200.35 | 200.35 | 9.51 | 0.007 |
| Error | 16 | 337.06 | 21.07 |  |  |
| Total | 19 | 1855.20 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 4.58978 | 81.83% | 78.43% | 44.49% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -36.76 | 7.01 | -5.24 | 0.000 |  |
| X1 | 0.000763 | 0.000636 | 1.20 | 0.248 | 1.06 |
| X2 | 1.192 | 0.562 | 2.12 | 0.050 | 2.99 |
| X3 | 4.72 | 1.53 | 3.08 | 0.007 | 3.08 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| Y | = | -36.76 + 0.000763 X1 + 1.192 X2 + 4.72 X3 |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Obs | Y | Fit | Resid | Std Resid |  |  |
| 8 | 35.70 | 25.67 | 10.03 | 2.26 | R |  |
| 11 | 14.50 | 19.16 | -4.66 | -2.31 | R | X |

*R  Large residual  
X  Unusual X*

**7b & 7c)**

Regression Analysis: Y versus X2, X1, X3

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 3 | 1518.14 | 506.05 | 24.02 | 0.000 |
| X2 | 1 | 94.91 | 94.91 | 4.51 | 0.050 |
| X1 | 1 | 30.29 | 30.29 | 1.44 | 0.248 |
| X3 | 1 | 200.35 | 200.35 | 9.51 | 0.007 |
| Error | 16 | 337.06 | 21.07 |  |  |
| Total | 19 | 1855.20 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 4.58978 | 81.83% | 78.43% | 44.49% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -36.76 | 7.01 | -5.24 | 0.000 |  |
| X2 | 1.192 | 0.562 | 2.12 | 0.050 | 2.99 |
| X1 | 0.000763 | 0.000636 | 1.20 | 0.248 | 1.06 |
| X3 | 4.72 | 1.53 | 3.08 | 0.007 | 3.08 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| Y | = | -36.76 + 1.192 X2 + 0.000763 X1 + 4.72 X3 |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Obs | Y | Fit | Resid | Std Resid |  |  |
| 8 | 35.70 | 25.67 | 10.03 | 2.26 | R |  |
| 11 | 14.50 | 19.16 | -4.66 | -2.31 | R | X |

*R  Large residual  
X  Unusual X*

**Chapter 10**

**4a & 4d)**

Regression Analysis: Y versus X3

The regression equation is  
Y = - 28.53 + 7.080 X3

Model Summary

|  |  |  |
| --- | --- | --- |
| S | R-sq | R-sq(adj) |
| 5.09685 | 74.80% | 73.39% |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P |
| Regression | 1 | 1387.60 | 1387.60 | 53.41 | 0.000 |
| Error | 18 | 467.60 | 25.98 |  |  |
| Total | 19 | 1855.20 |  |  |  |

Regression Analysis: Y versus X1, X3

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 2 | 1423.23 | 711.62 | 28.01 | 0.000 |
| X1 | 1 | 35.63 | 35.63 | 1.40 | 0.253 |
| X3 | 1 | 1414.88 | 1414.88 | 55.68 | 0.000 |
| Error | 17 | 431.97 | 25.41 |  |  |
| Total | 19 | 1855.20 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 5.04083 | 76.72% | 73.98% | 41.71% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -31.60 | 7.22 | -4.38 | 0.000 |  |
| X1 | 0.000827 | 0.000698 | 1.18 | 0.253 | 1.06 |
| X3 | 7.352 | 0.985 | 7.46 | 0.000 | 1.06 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| Y | = | -31.60 + 0.000827 X1 + 7.352 X3 |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Obs | Y | Fit | Resid | Std Resid |  |  |
| 8 | 35.70 | 25.54 | 10.16 | 2.09 | R |  |
| 11 | 14.50 | 19.04 | -4.54 | -2.05 | R | X |

*R  Large residual  
X  Unusual X*

**4d)**

Regression Analysis: Y versus X2, X1, X3

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 3 | 1518.14 | 506.05 | 24.02 | 0.000 |
| X2 | 1 | 94.91 | 94.91 | 4.51 | 0.050 |
| X1 | 1 | 30.29 | 30.29 | 1.44 | 0.248 |
| X3 | 1 | 200.35 | 200.35 | 9.51 | 0.007 |
| Error | 16 | 337.06 | 21.07 |  |  |
| Total | 19 | 1855.20 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 4.58978 | 81.83% | 78.43% | 44.49% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | -36.76 | 7.01 | -5.24 | 0.000 |  |
| X2 | 1.192 | 0.562 | 2.12 | 0.050 | 2.99 |
| X1 | 0.000763 | 0.000636 | 1.20 | 0.248 | 1.06 |
| X3 | 4.72 | 1.53 | 3.08 | 0.007 | 3.08 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| Y | = | -36.76 + 1.192 X2 + 0.000763 X1 + 4.72 X3 |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Obs | Y | Fit | Resid | Std Resid |  |  |
| 8 | 35.70 | 25.67 | 10.03 | 2.26 | R |  |
| 11 | 14.50 | 19.16 | -4.66 | -2.31 | R | X |

*R  Large residual  
X  Unusual X*