James Hahn

STAT1221

Homework #8

MINITAB Output

**Chapter 15**

2a)

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Regression | 1 | 442.91 | 442.915 | 4.16 | 0.053 |
| INC | 1 | 442.91 | 442.915 | 4.16 | 0.053 |
| Error | 23 | 2448.13 | 106.440 |  |  |
| Lack-of-Fit | 18 | 2432.93 | 135.163 | 44.46 | 0.000 |
| Pure Error | 5 | 15.20 | 3.040 |  |  |
| Total | 24 | 2891.05 |  |  |  |

2b)

Polynomial Regression Analysis: Time versus INC

The regression equation is  
Time = - 19.87 + 0.007871 INC - 0.000000 INC^2

Model Summary

|  |  |  |
| --- | --- | --- |
| S | R-sq | R-sq(adj) |
| 3.97749 | 87.96% | 86.87% |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P |
| Regression | 2 | 2543.00 | 1271.50 | 80.37 | 0.000 |
| Error | 22 | 348.05 | 15.82 |  |  |
| Total | 24 | 2891.05 |  |  |  |

Sequential Analysis of Variance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source | DF | SS | F | P |
| Linear | 1 | 442.91 | 4.16 | 0.053 |
| Quadratic | 1 | 2100.08 | 132.74 | 0.000 |

2c)





2d)



7a)







7b)

Regression Analysis: SkinRespon versus Conc

The regression equation is  
SkinRespon = 13.99 - 0.1803 Conc

Model Summary

|  |  |  |
| --- | --- | --- |
| S | R-sq | R-sq(adj) |
| 0.186035 | 45.11% | 39.62% |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P |
| Regression | 1 | 0.284401 | 0.284401 | 8.22 | 0.017 |
| Error | 10 | 0.346091 | 0.034609 |  |  |
| Total | 11 | 0.630492 |  |  |  |

Polynomial Regression Analysis: SkinRespon versus Conc

The regression equation is  
SkinRespon = 14.27 - 0.6065 Conc + 0.1218 Conc^2

Model Summary

|  |  |  |
| --- | --- | --- |
| S | R-sq | R-sq(adj) |
| 0.175397 | 56.09% | 46.33% |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P |
| Regression | 2 | 0.353616 | 0.176808 | 5.75 | 0.025 |
| Error | 9 | 0.276876 | 0.030764 |  |  |
| Total | 11 | 0.630492 |  |  |  |

Sequential Analysis of Variance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source | DF | SS | F | P |
| Linear | 1 | 0.284401 | 8.22 | 0.017 |
| Quadratic | 1 | 0.069215 | 2.25 | 0.168 |

Polynomial Regression Analysis: SkinRespon versus Conc

The regression equation is  
SkinRespon = 13.36 + 1.680 Conc - 1.393 Conc^2 + 0.2885 Conc^3

Model Summary

|  |  |  |
| --- | --- | --- |
| S | R-sq | R-sq(adj) |
| 0.116356 | 82.82% | 76.38% |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P |
| Regression | 3 | 0.522183 | 0.174061 | 12.86 | 0.002 |
| Error | 8 | 0.108309 | 0.013539 |  |  |
| Total | 11 | 0.630492 |  |  |  |

Sequential Analysis of Variance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source | DF | SS | F | P |
| Linear | 1 | 0.284401 | 8.22 | 0.017 |
| Quadratic | 1 | 0.069215 | 2.25 | 0.168 |
| Cubic | 1 | 0.168567 | 12.45 | 0.008 |