## *Practice Problems*

**Problem 12.5:** (Continuation of Problem 12.1)

SAS Printout for estimation and Prediction Intervals:

| Obs | Dep Var Y | Predict Value | Std Err Predict | Lower95% Mean | Upper95% Mean | Lower95% Predict | Upper95% Predict | Residual |
|---|---|---|---|---|---|---|---|---|
| 1 | 4.3000 | 4.3333 | 0.231 | 3.8098 | 4.8568 | 3.3141 | 5.3525 | -0.0333 |
| 2 | 5.5000 | 5.6500 | 0.183 | 5.2352 | 6.0648 | 4.6821 | 6.6179 | -0.1500 |
| 3 | 6.8000 | 6.9667 | 0.183 | 6.5519 | 7.3815 | 5.9988 | 7.9346 | -0.1667 |
| 4 | 8.0000 | 8.2833 | 0.231 | 7.7598 | 8.8068 | 7.2641 | 9.3025 | -0.2833 |
| 5 | 4.0000 | 3.5333 | 0.187 | 3.1109 | 3.9558 | 2.5621 | 4.5045 | 0.4667 |
| 6 | 5.2000 | 4.8500 | 0.122 | 4.5735 | 5.1265 | 3.9328 | 5.7672 | 0.3500 |
| 7 | 6.6000 | 6.1667 | 0.122 | 5.8901 | 6.4432 | 5.2495 | 7.0839 | 0.4333 |
| 8 | 7.5000 | 7.4833 | 0.187 | 7.0609 | 7.9058 | 6.5121 | 8.4545 | 0.0167 |
| 9 | 2.0000 | 2.7333 | 0.231 | 2.2098 | 3.2568 | 1.7141 | 3.7525 | -0.7333 |
| 10 | 4.0000 | 4.0500 | 0.183 | 3.6352 | 4.4648 | 3.0821 | 5.0179 | -0.0500 |
| 11 | 5.7000 | 5.3667 | 0.183 | 4.9519 | 5.7815 | 4.3988 | 6.3346 | 0.3333 |
| 12 | 6.5000 | 6.6833 | 0.231 | 6.1598 | 7.2068 | 5.6641 | 7.7025 | -0.1833 |

| | |
|---|---|
| Sum of Residuals | 0 |
| Sum of Squared Residuals | 1.3450 |
| Predicted Resid SS (Press) | 2.6123 |

(a) What is the 90% confidence interval for $E(y)$ at Exposure Time = 7 and Humidity = 0.4, i.e., the last observation in the data?

(b) What is the 95% prediction interval for $y$ at Exposure Time = 7 and Humidity = 0.4, i.e., the last observation in the data?

**Problem 12.6**: (Continuation of Problem 12.2)

SAS Printout for estimation and Prediction Intervals:

| Obs | Dep Var Y | Predict Value | Std Err Predict | Lower95% Mean | Upper95% Mean | Lower95% Predict | Upper95% Predict | Residual |
|---|---|---|---|---|---|---|---|---|
| 1 | 28.1000 | 29.4133 | 0.716 | 27.8523 | 30.9743 | 26.1638 | 32.6628 | -1.3133 |
| 2 | 32.3000 | 32.7000 | 0.585 | 31.4254 | 33.9746 | 29.5780 | 35.8220 | -0.4000 |
| 3 | 34.8000 | 35.9867 | 0.534 | 34.8232 | 37.1502 | 32.9083 | 39.0650 | -1.1867 |
| 4 | 38.2000 | 39.2733 | 0.585 | 37.9988 | 40.5479 | 36.1513 | 42.3954 | -1.0733 |
| 5 | 43.5000 | 42.5600 | 0.716 | 40.9990 | 44.1210 | 39.3105 | 45.8095 | 0.9400 |
| 6 | 60.3000 | 58.5133 | 0.585 | 57.2388 | 59.7879 | 55.3913 | 61.6354 | 1.7867 |
| 7 | 63.7000 | 61.8000 | 0.414 | 60.8988 | 62.7012 | 58.8109 | 64.7891 | 1.9000 |
| 8 | 65.4000 | 65.0867 | 0.338 | 64.3508 | 65.8225 | 62.1432 | 68.0301 | 0.3133 |
| 9 | 69.2000 | 68.3733 | 0.414 | 67.4721 | 69.2746 | 65.3842 | 71.3624 | 0.8267 |
| 10 | 72.9000 | 71.6600 | 0.585 | 70.3854 | 72.9346 | 68.5380 | 74.7820 | 1.2400 |
| 11 | 88.2000 | 87.6133 | 0.716 | 86.0523 | 89.1743 | 84.3638 | 90.8628 | 0.5867 |
| 12 | 89.3000 | 90.9000 | 0.585 | 89.6254 | 92.1746 | 87.7780 | 94.0220 | -1.6000 |
| 13 | 94.1000 | 94.1867 | 0.534 | 93.0232 | 95.3502 | 91.1083 | 97.2650 | -0.0867 |
| 14 | 95.7000 | 97.4733 | 0.585 | 96.1988 | 98.7479 | 94.3513 | 100.6 | -1.7733 |
| 15 | 100.6 | 100.8 | 0.716 | 99.1990 | 102.3 | 97.5105 | 104.0 | -0.1600 |

| | |
|---|---|
| Sum of Residuals | 0 |
| Sum of Squared Residuals | 20.5320 |
| Predicted Resid SS (Press) | 31.8837 |

(a) What is the 90% confidence interval for $E(y)$ at Agitation = 1 and Amount = 6, i.e., the first observation in the data?

(b) What is the 95% prediction interval for $y$ at Agitation = 1 and Amount = 6, i.e., the first observation in the data?