Example 2 – two independent variables

Deviance

| Deviance and Pearson Goodness-of-Fit Statistics | | | | |
|---|---|---|---|---|
| **Criterion** | **Value** | **DF** | **Value/DF** | **Pr > ChiSq** |
| **Deviance** | 29.7723 | 35 | 0.8506 | 0.7184 |
| **Pearson** | 39.0106 | 35 | 1.1146 | 0.2942 |

Parameter estimates with confidence interval

| Analysis of Maximum Likelihood Estimates | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **DF** | **Estimate** | **Standard Error** | **Wald Chi-Square** | **Pr > ChiSq** |
| **Intercept** | 1 | -9.5293 | 3.2331 | 8.6873 | 0.0032 |
| **volume** | 1 | 3.8820 | 1.4286 | 7.3844 | 0.0066 |
| **rate** | 1 | 2.6490 | 0.9142 | 8.3966 | 0.0038 |

Covariance matrix

| Estimated Covariance Matrix | | | |
|---|---|---|---|
| **Parameter** | **Intercept** | **volume** | **rate** |
| **Intercept** | 10.45283 | -4.32469 | -2.729 |
| **volume** | -4.32469 | 2.040791 | 0.99885 |
| **rate** | -2.729 | 0.99885 | 0.835746 |

a) Write down the fitted line.
b) Find the 95% confidence interval of unknown parameters.
c) Estimate the odds ratio for one unit increase in volume with its 95% confidence interval.
d) Estimate the odds ratio for one unit increase in rate with its 95% confidence interval.
e) Estimate the odds ratio for one unit increase in volume & one unit increase in rate with its 95% confidence interval.
f) Estimate the probability of success when volume=1 & rate=1 with its 95% confidence interval.