# Introduction

We have to find whether there is a difference in the level of graduation degrees (Masters or Bachelors) between Men and Women working in Information Technology at a financial services firm.

The data was collected by interviewing 15 employees (9 males and 6 females) and asking them about their level of graduation degree.

The null hypothesis is that the gender is not related to the graduation level. We will use a confidence level of 95%

# Data

The data is:

|  |  |
| --- | --- |
| **Gender** | **Master / Bachelor** |
| M | B |
| M | B |
| M | B |
| F | M |
| M | M |
| F | B |
| F | M |
| M | B |
| M | B |
| M | B |
| M | M |
| F | M |
| F | M |
| M | B |
| F | B |

# Analysis

Binary Logistic Regression: Master / Bachelor versus Gender

Method

|  |  |
| --- | --- |
| Link function | Logit |
| Categorical predictor coding | (1, 0) |
| Rows used | 15 |

Response Information

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Value | Count |  |
| Master / Bachelor | M | 6 | (Event) |
|  | B | 9 |  |
|  | Total | 15 |  |

Deviance Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj Dev | Adj Mean | Chi-Square | P-Value |
| Regression | 1 | 3.017 | 3.017 | 3.02 | 0.082 |
| Gender | 1 | 3.017 | 3.017 | 3.02 | 0.082 |
| Error | 13 | 17.173 | 1.321 |  |  |
| Total | 14 | 20.190 |  |  |  |

Model Summary

|  |  |  |
| --- | --- | --- |
| Deviance R-Sq | Deviance R-Sq(adj) | AIC |
| 14.95% | 9.99% | 21.17 |

Coefficients

|  |  |  |  |
| --- | --- | --- | --- |
| Term | Coef | SE Coef | VIF |
| Constant | 0.693 | 0.866 |  |
| Gender |  |  |  |
| M | -1.95 | 1.18 | 1.00 |

Odds Ratios for Categorical Predictors

|  |  |  |  |
| --- | --- | --- | --- |
| Level A | Level B | Odds Ratio | 95% CI |
| Gender |  |  |  |
| M | F | 0.1429 | (0.0141, 1.4437) |

*Odds ratio for level A relative to level B*

Regression Equation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P(M) | | = | | exp(Y')/(1 + exp(Y')) |
| Y' | = | | 0.693 + 0.0 Gender\_F - 1.95 Gender\_M | | |

Goodness-of-Fit Tests

|  |  |  |  |
| --- | --- | --- | --- |
| Test | DF | Chi-Square | P-Value |
| Deviance | 13 | 17.17 | 0.192 |
| Pearson | 13 | 15.00 | 0.307 |
| Hosmer-Lemeshow | 0 | 0.00 | \* |

# Conclusion

We see above that the p-values > 0.05 and therefore we are not able to reject the null hypothesis and deduce that the gender and qualification level are not related.