**data** glogit\_data;

do x1 = **1** to **4**;

do x2 = **1** to **3**;

do y = **1** to **3**;

input x3 @@;

output;

end;

end;

end;

datalines;

0 0 1 7 8 8 19 8 1

6 9 12 11 7 6 1 0 0

1 1 6 8 23 7 5 1 0

0 0 0 1 3 7 14 16 11

;

**proc** **format**;

value y\_fmt **1**='Minimal' **2**='Moderate' **3**='Severe';

value x1\_fmt **1**='Treatment1' **2**='Treatment2' **3** ='Treatment3' **4**='Treatment4';

value x2\_fmt **1**='Low' **2**='Median' **3**='High';

**run**;

/\*Example1\*/

%***GLogit***(DSName=glogit\_data, Dir =, Outcome=y(ref='Minimal'), Freq=, PredictNum=x3, PredictClass=x1(ref='Treatment1') x2(ref='Low'), Format=y\_fmt. x1\_fmt. x2\_fmt., OutFormat=rtf, OutFileName=GlogitOutput1);

The following output will be generated in the specified directory after running Example1.

|  |
| --- |
| ***Generalized logistic regression model (Outcome: y, Predictor variable(s): x3 x1 x2)*** |

|  |
| --- |
| ***The LOGISTIC Procedure*** |

| **Response Profile** | | |
| --- | --- | --- |
| **Ordered Value** | **y** | **Total Frequency** |
| **1** | Severe | 12 |
| **2** | Moderate | 12 |
| **3** | Minimal | 12 |

|  |
| --- |
| ***Logits modeled use y='Minimal' as the reference category.*** |

| **Testing Global Null Hypothesis: BETA=0** | | | |
| --- | --- | --- | --- |
| **Test** | **Chi-Square** | **DF** | **Pr > ChiSq** |
| **Likelihood Ratio** | 0.4859 | 12 | 1.0000 |
| **Score** | 0.4693 | 12 | 1.0000 |
| **Wald** | 0.4604 | 12 | 1.0000 |

| **Type 3 Analysis of Effects** | | | |
| --- | --- | --- | --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **x3** | 2 | 0.4602 | 0.7944 |
| **x1** | 6 | 0.0000 | 1.0000 |
| **x2** | 4 | 0.0637 | 0.9995 |

| **Analysis of Maximum Likelihood Estimates** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** |  | **y** | **DF** | **Estimate** | **Standard Error** | **Wald Chi-Square** | **Pr > ChiSq** |
| **Intercept** |  | **Severe** | 1 | 0.1237 | 1.0238 | 0.0146 | 0.9038 |
| **Intercept** |  | **Moderate** | 1 | -0.0251 | 1.0331 | 0.0006 | 0.9806 |
| **x3** |  | **Severe** | 1 | -0.0429 | 0.0793 | 0.2927 | 0.5885 |
| **x3** |  | **Moderate** | 1 | 0.00797 | 0.0730 | 0.0119 | 0.9130 |
| **x1** | **Treatment2** | **Severe** | 1 | -0.00043 | 1.1598 | 0.0000 | 0.9997 |
| **x1** | **Treatment2** | **Moderate** | 1 | -0.00072 | 1.1558 | 0.0000 | 0.9995 |
| **x1** | **Treatment3** | **Severe** | 1 | -0.00471 | 1.1596 | 0.0000 | 0.9968 |
| **x1** | **Treatment3** | **Moderate** | 1 | -0.00125 | 1.1554 | 0.0000 | 0.9991 |
| **x1** | **Treatment4** | **Severe** | 1 | -0.00265 | 1.1593 | 0.0000 | 0.9982 |
| **x1** | **Treatment4** | **Moderate** | 1 | -0.00094 | 1.1552 | 0.0000 | 0.9993 |
| **x2** | **High** | **Severe** | 1 | 0.1302 | 1.0338 | 0.0159 | 0.8997 |
| **x2** | **High** | **Moderate** | 1 | -0.0301 | 1.0388 | 0.0008 | 0.9769 |
| **x2** | **Median** | **Severe** | 1 | 0.2097 | 1.0747 | 0.0381 | 0.8453 |
| **x2** | **Median** | **Moderate** | 1 | -0.0409 | 1.0682 | 0.0015 | 0.9694 |

| **Odds Ratio Estimates** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **y** | **Point Estimate** | **95% Wald Confidence Limits** | |
| **x3** | **Severe** | 0.958 | 0.820 | 1.119 |
| **x3** | **Moderate** | 1.008 | 0.874 | 1.163 |
| **x1 Treatment2 vs Treatment1** | **Severe** | 1.000 | 0.103 | 9.705 |
| **x1 Treatment2 vs Treatment1** | **Moderate** | 0.999 | 0.104 | 9.627 |
| **x1 Treatment3 vs Treatment1** | **Severe** | 0.995 | 0.103 | 9.660 |
| **x1 Treatment3 vs Treatment1** | **Moderate** | 0.999 | 0.104 | 9.615 |
| **x1 Treatment4 vs Treatment1** | **Severe** | 0.997 | 0.103 | 9.675 |
| **x1 Treatment4 vs Treatment1** | **Moderate** | 0.999 | 0.104 | 9.613 |
| **x2 High vs Low** | **Severe** | 1.139 | 0.150 | 8.641 |
| **x2 High vs Low** | **Moderate** | 0.970 | 0.127 | 7.432 |
| **x2 Median vs Low** | **Severe** | 1.233 | 0.150 | 10.136 |
| **x2 Median vs Low** | **Moderate** | 0.960 | 0.118 | 7.790 |

/\* Example2: Consider x2 be the frequency of occurance, we can run the macro as following: \*/

%***GLogit***(DSName=glogit\_data, Dir =, Outcome=y(ref='Minimal'), Freq=x2, PredictNum=x3, PredictClass=x1(ref='4'), Format=y\_fmt. **.**, OutFormat=rtf, OutFileName=GlogitOutput2);

The following output will be generated in the specified directory after running Example2.

|  |
| --- |
| ***Generalized logistic regression model (Outcome: y, Predictor variable(s): x3 x1)*** |

|  |  |  |
| --- | --- | --- |
| ***The LOGISTIC Procedure*** | | |
| **Response Profile** | | | | |
| **Ordered Value** | | **y** | **Total Frequency** | |
| **1** | | Severe | 24 | |
| **2** | | Moderate | 24 | |
| **3** | | Minimal | 24 | |

|  |
| --- |
| ***Logits modeled use y='Minimal' as the reference category.*** |

| **Testing Global Null Hypothesis: BETA=0** | | | |
| --- | --- | --- | --- |
| **Test** | **Chi-Square** | **DF** | **Pr > ChiSq** |
| **Likelihood Ratio** | 3.3019 | 8 | 0.9140 |
| **Score** | 3.0878 | 8 | 0.9287 |
| **Wald** | 2.9421 | 8 | 0.9379 |

| **Type 3 Analysis of Effects** | | | |
| --- | --- | --- | --- |
| **Effect** | **DF** | **Wald Chi-Square** | **Pr > ChiSq** |
| **x3** | 2 | 2.9394 | 0.2300 |
| **x1** | 6 | 0.1937 | 0.9999 |

| **Analysis of Maximum Likelihood Estimates** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** |  | **y** | **DF** | **Estimate** | **Standard Error** | **Wald Chi-Square** | **Pr > ChiSq** |
| **Intercept** |  | **Severe** | 1 | 0.6818 | 0.7203 | 0.8959 | 0.3439 |
| **Intercept** |  | **Moderate** | 1 | 0.1107 | 0.7186 | 0.0237 | 0.8776 |
| **x3** |  | **Severe** | 1 | -0.0890 | 0.0543 | 2.6900 | 0.1010 |
| **x3** |  | **Moderate** | 1 | -0.0122 | 0.0472 | 0.0670 | 0.7957 |
| **x1** | **1** | **Severe** | 1 | -0.0742 | 0.8366 | 0.0079 | 0.9294 |
| **x1** | **1** | **Moderate** | 1 | -0.0103 | 0.8179 | 0.0002 | 0.9899 |
| **x1** | **2** | **Severe** | 1 | -0.3152 | 0.8529 | 0.1365 | 0.7118 |
| **x1** | **2** | **Moderate** | 1 | -0.0516 | 0.8408 | 0.0038 | 0.9510 |
| **x1** | **3** | **Severe** | 1 | -0.2310 | 0.8485 | 0.0741 | 0.7854 |
| **x1** | **3** | **Moderate** | 1 | -0.0294 | 0.8250 | 0.0013 | 0.9715 |

| **Odds Ratio Estimates** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **y** | **Point Estimate** | **95% Wald Confidence Limits** | |
| **x3** | **Severe** | 0.915 | 0.823 | 1.018 |
| **x3** | **Moderate** | 0.988 | 0.901 | 1.084 |
| **x1 1 vs 4** | **Severe** | 0.929 | 0.180 | 4.785 |
| **x1 1 vs 4** | **Moderate** | 0.990 | 0.199 | 4.917 |
| **x1 2 vs 4** | **Severe** | 0.730 | 0.137 | 3.883 |
| **x1 2 vs 4** | **Moderate** | 0.950 | 0.183 | 4.935 |
| **x1 3 vs 4** | **Severe** | 0.794 | 0.150 | 4.187 |
| **x1 3 vs 4** | **Moderate** | 0.971 | 0.193 | 4.892 |