

```

options ps=48;
data insect;
  do type='a DDT ' ,'b both ';
    typeboth=(type='b both ');
  do deposit=2,2.64,3.48,4.59,6.06,8;
    ldeposit=log(deposit);
    input dead n @@; output;
  end; end; datalines;
3 50 5 49 19 47 19 38 24 49 35 50
28 50 37 50 46 50 48 50 48 50 50 50
;
proc sort; by type; run;
proc logistic;
  model dead/n=ldeposit;
  by type;
run;

```

```

----- type=a DDT -----

                                The LOGISTIC Procedure

                                Model Information
Data Set                        WORK.NEW                               Predicted Values and Diagnostic Statistics
Response Variable (Events)     dead
Response Variable (Trials)     n
Model                          binary logit
Optimization Technique         Fisher's scoring

                                Number of Observations Read          6
                                Number of Observations Used           6
                                Sum of Frequencies Read                283
                                Sum of Frequencies Used                283

                                Response Profile
                                Ordered   Binary      Total
                                Value     Outcome    Frequency
                                1         Event       105
                                2         Nonevent    178

                                Model Convergence Status
Convergence criterion (GCONV=1E-8) satisfied.

                                Model Fit Statistics
                                Criterion    Intercept    Intercept
                                Only          and
                                Only          Covariates
AIC                                375.276        312.870
SC                                 378.922        320.161
-2 Log L                           373.276        308.870

                                Testing Global Null Hypothesis: BETA=0
Test                               Chi-Square    DF      Pr > ChiSq
Likelihood Ratio                   64.4061       1       <.0001
Score                              59.9907       1       <.0001
Wald                               51.1977       1       <.0001

                                Analysis of Maximum Likelihood Estimates
                                Standard      Wald
Parameter  DF   Estimate  Error    Chi-Square  Pr > ChiSq

```

Intercept	1	-3.8303	0.5001	58.6534	<.0001
ldeposit	1	2.2822	0.3190	51.1977	<.0001

Odds Ratio Estimates

	Point	95% Wald
Effect	Estimate	Confidence Limits
ldeposit	9.798	5.244 18.308

Association of Predicted Probabilities and Observed Responses

Percent Concordant	70.9	Somers' D	0.544
Percent Discordant	16.4	Gamma	0.624
Percent Tied	12.7	Tau-a	0.255
Pairs	18690	c	0.772

----- type=b both -----

The LOGISTIC Procedure

Model Information

Data Set	WORK.NEW	Predicted Values and Diagnostic Statistics
Response Variable (Events)	dead	
Response Variable (Trials)	n	
Model	binary logit	
Optimization Technique	Fisher's scoring	

Number of Observations Read	6
Number of Observations Used	6
Sum of Frequencies Read	300
Sum of Frequencies Used	300

Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	257
2	Nonevent	43

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

	Intercept Only	Intercept and Covariates
Criterion		
AIC	248.581	193.716
SC	252.285	201.124
-2 Log L	246.581	189.716

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	56.8651	1	<.0001
Score	48.8937	1	<.0001
Wald	34.9263	1	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-2.1207	0.5908	12.8848	0.0003
ldeposit	1	3.3884	0.5733	34.9263	<.0001

Odds Ratio Estimates			
	Point	95% Wald	
Effect	Estimate	Confidence Limits	
ldeposit	29.618	9.628	91.113
Association of Predicted Probabilities and Observed Responses			
Percent Concordant	76.1	Somers' D	0.656
Percent Discordant	10.5	Gamma	0.757
Percent Tied	13.3	Tau-a	0.162
Pairs	11051	c	0.828

```
proc logistic;
  model dead/n=typeboth ldeposit typeboth*ldeposit;
run;
```

The LOGISTIC Procedure					
Model Information					
Data Set	WORK.NEW	Predicted Values and Diagnostic Statistics			
Response Variable (Events)	dead				
Response Variable (Trials)	n				
Model	binary logit				
Optimization Technique	Fisher's scoring				
Number of Observations Read		12			
Number of Observations Used		12			
Sum of Frequencies Read		583			
Sum of Frequencies Used		583			
Response Profile					
Ordered Value	Binary Outcome	Total Frequency			
1	Event	362			
2	Nonevent	221			
Model Convergence Status					
Convergence criterion (GCONV=1E-8) satisfied.					
Model Fit Statistics					
	Intercept Only	Intercept and Covariates			
Criterion					
AIC	775.768	506.586			
SC	780.136	524.059			
-2 Log L	773.768	498.586			
Testing Global Null Hypothesis: BETA=0					
Test	Chi-Square	DF	Pr > ChiSq		
Likelihood Ratio	275.1817	3	<.0001		
Score	230.9021	3	<.0001		
Wald	133.8380	3	<.0001		
Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-3.8308	0.5002	58.6591	<.0001
typeboth	1	1.7102	0.7741	4.8814	0.0271
ldeposit	1	2.2824	0.3190	51.2033	<.0001
typeboth*ldeposit	1	1.1058	0.6561	2.8407	0.0919

Association of Predicted Probabilities and Observed Responses

Percent Concordant	84.5	Somers' D	0.738
Percent Discordant	10.7	Gamma	0.775
Percent Tied	4.8	Tau-a	0.348
Pairs	80002	c	0.869

```
proc logistic;
  model dead/n=typeboth ldeposit / lackfit;
  output out=new resdev=residuals;
run;
proc print noobs; run;
```

The LOGISTIC Procedure

Model Information

Data Set	WORK.NEW	Predicted Values and Diagnostic Statistics
Response Variable (Events)	dead	
Response Variable (Trials)	n	
Model	binary logit	
Optimization Technique	Fisher's scoring	

Number of Observations Read	12
Number of Observations Used	12
Sum of Frequencies Read	583
Sum of Frequencies Used	583

Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	362
2	Nonevent	221

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	775.768	507.663
SC	780.136	520.768
-2 Log L	773.768	501.663

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	272.1047	2	<.0001
Score	227.2781	2	<.0001
Wald	146.2932	2	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-4.3002	0.4446	93.5706	<.0001
typeboth	1	2.9823	0.2633	128.3194	<.0001
ldeposit	1	2.5927	0.2770	87.6127	<.0001

Odds Ratio Estimates

Point	95% Wald
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Effect	Estimate	Confidence Limits	
typeboth	19.734	11.779	33.061
ldeposit	13.365	7.766	23.002

Association of Predicted Probabilities and Observed Responses

Percent Concordant	84.7	Somers' D	0.742
Percent Discordant	10.5	Gamma	0.779
Percent Tied	4.8	Tau-a	0.350
Pairs	80002	c	0.871

Partition for the Hosmer and Lemeshow Test

Group	Total	Event		Nonevent	
		Observed	Expected	Observed	Expected
1	50	3	3.78	47	46.22
2	49	5	7.05	44	41.95
3	47	19	12.03	28	34.97
4	38	19	15.71	19	22.29
5	49	24	28.99	25	20.01
6	50	28	30.88	22	19.12
7	50	35	37.43	15	12.57
8	50	37	38.42	13	11.58
9	50	46	43.58	4	6.42
10	50	48	46.65	2	3.35
11	50	48	48.31	2	1.69
12	50	50	49.16	0	0.84

Hosmer and Lemeshow Goodness-of-Fit Test

Chi-Square	DF	Pr > ChiSq
13.6718	10	0.1885

type	typeboth	deposit	ldeposit	dead	n	residuals	residuals2
a DDT	0	2.00	0.69315	3	50	-0.43280	-0.43280
a DDT	0	2.64	0.97078	5	49	-0.87365	-0.87365
a DDT	0	3.48	1.24703	19	47	2.21792	2.21792
a DDT	0	4.59	1.52388	19	38	1.07390	1.07390
a DDT	0	6.06	1.80171	24	49	-1.43811	-1.43811
a DDT	0	8.00	2.07944	35	50	-0.77657	-0.77657
b both	1	2.00	0.69315	28	50	-0.83066	-0.83066
b both	1	2.64	0.97078	37	50	-0.46881	-0.46881
b both	1	3.48	1.24703	46	50	1.08930	1.08930
b both	1	4.59	1.52388	48	50	0.82297	0.82297
b both	1	6.06	1.80171	48	50	-0.23653	-0.23653
b both	1	8.00	2.07944	50	50	1.29907	1.29907