

```

data insect;
do type='a DDT ', 'b g-BHC', 'c both ';
  typeddt=(type='a DDT '); typeboth=(type='c 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
2 50 14 49 20 50 27 50 41 50 40 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.INSECT				
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					
	Intercept	Intercept			
Criterion	Only	and			
		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

Effect	Point Estimate	95% Wald 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 g-BHC -----

The LOGISTIC Procedure

Model Information

Data Set	WORK.INSECT
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	299
Sum of Frequencies Used	299

Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	144
2	Nonevent	155

Model Convergence Status

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

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	416.097	321.058
SC	419.798	328.459
-2 Log L	414.097	317.058

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	97.0392	1	<.0001
Score	87.7513	1	<.0001
Wald	69.9995	1	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-4.0428	0.4972	66.1070	<.0001
ldeposit	1	2.8381	0.3392	69.9995	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
ldeposit	17.083	8.787 33.212

Association of Predicted Probabilities and Observed Responses

Percent Concordant	75.1	Somers' D	0.617
Percent Discordant	13.4	Gamma	0.698
Percent Tied	11.5	Tau-a	0.309
Pairs	22320	c	0.809

----- type=c both -----

The LOGISTIC Procedure

Model Information

Data Set	WORK.INSECT
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 Fit Statistics

Criterion	Intercept and Covariates	
	Intercept Only	Intercept and Covariates
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

Effect	Point Estimate		95% Wald Confidence Limits	
	Estimate			
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=typeddt typeboth ldeposit typeddt*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	18
Number of Observations Used	18
Sum of Frequencies Read	882
Sum of Frequencies Used	882

Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	506
2	Nonevent	376

Model Convergence Status

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

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1205.481	827.644
SC	1210.263	856.337
-2 Log L	1203.481	815.644

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	387.8364	5	<.0001
Score	327.4879	5	<.0001
Wald	205.5601	5	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-4.0428	0.4972	66.1070	<.0001
typeddt	1	0.2120	0.7053	0.0904	0.7637
typeboth	1	1.9223	0.7722	6.1977	0.0128
ldeposit	1	2.8381	0.3392	69.9995	<.0001
typeddt*ldeposit	1	-0.5557	0.4656	1.4241	0.2327
typeboth*ldeposit	1	0.5500	0.6661	0.6818	0.4090

Association of Predicted Probabilities and Observed Responses

Percent Concordant	83.8	Somers' D	0.711
Percent Discordant	12.8	Gamma	0.736
Percent Tied	3.4	Tau-a	0.348
Pairs	190256	c	0.855

```

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

```

The LOGISTIC Procedure

Model Information

Data Set	WORK.INSECT
Response Variable (Events)	dead
Response Variable (Trials)	n
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	18
Number of Observations Used	18
Sum of Frequencies Read	882
Sum of Frequencies Used	882

Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	506
2	Nonevent	376

Model Convergence Status

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

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1205.481	827.037
SC	1210.263	846.166
-2 Log L	1203.481	819.037

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	384.4439	3	<.0001
Score	317.1755	3	<.0001
Wald	217.7538	3	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-3.8396	0.3313	134.3314	<.0001
typeddt	1	-0.6144	0.1999	9.4516	0.0021
typeboth	1	2.4169	0.2379	103.1901	<.0001
ldeposit	1	2.6937	0.2146	157.5363	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
typeddt	0.541	0.366 0.800
typeboth	11.211	7.033 17.872
ldeposit	14.786	9.709 22.519

Association of Predicted Probabilities and Observed Responses

Percent Concordant	83.7	Somers' D	0.709
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Percent Discordant	12.9	Gamma	0.733
Percent Tied	3.4	Tau-a	0.347
Pairs	190256	c	0.854

Partition for the Hosmer and Lemeshow Test

Group	Total	Event		Nonevent	
		Observed	Expected	Observed	Expected
1	100	5	9.61	95	90.39
2	98	19	17.85	79	80.15
3	97	39	30.89	58	66.11
4	88	46	44.01	42	43.99
5	99	52	59.79	47	39.21
6	100	76	74.64	24	25.36
7	100	77	81.03	23	18.97
8	100	94	90.50	6	9.50
9	100	98	97.68	2	2.32

Hosmer and Lemeshow Goodness-of-Fit Test

Chi-Square	DF	Pr > ChiSq
11.0284	7	0.1374

type	typeddt	typeboth	deposit	ldeposit	dead	n	residuals
a DDT	1	0	2.00	0.69315	3	50	-0.28336
a DDT	1	0	2.64	0.97078	5	49	-0.74387
a DDT	1	0	3.48	1.24703	19	47	2.30502
a DDT	1	0	4.59	1.52388	19	38	1.07327
a DDT	1	0	6.06	1.80171	24	49	-1.53622
a DDT	1	0	8.00	2.07944	35	50	-0.95204
b g-BHC	0	0	2.00	0.69315	2	50	-2.02996
b g-BHC	0	0	2.64	0.97078	14	49	0.95243
b g-BHC	0	0	3.48	1.24703	20	50	0.25900
b g-BHC	0	0	4.59	1.52388	27	50	-0.36937
b g-BHC	0	0	6.06	1.80171	41	50	1.43759
b g-BHC	0	0	8.00	2.07944	40	50	-1.02205
c both	0	1	2.00	0.69315	28	50	-0.71011
c both	0	1	2.64	0.97078	37	50	-0.44855
c both	0	1	3.48	1.24703	46	50	1.04232
c both	0	1	4.59	1.52388	48	50	0.74278
c both	0	1	6.06	1.80171	48	50	-0.33686
c both	0	1	8.00	2.07944	50	50	1.23295