

Logistic Regression Homework

1

Obs	ID	Split60	X1	X2	X3	X4	X5	X6	X7	X11
1	1	1	4.1	0.6	6.9	4.7	2.4	2.3	5.2	0
2	2	1	1.8	3.0	6.3	6.6	2.5	4.0	8.4	1
3	5	1	6.0	0.9	9.6	7.8	3.4	4.6	4.5	0
4	6	1	1.9	3.3	7.9	4.8	2.6	1.9	9.7	1
5	7	1	4.6	2.4	9.5	6.6	3.5	4.5	7.6	0
6	8	1	1.3	4.2	6.2	5.1	2.8	2.2	6.9	1
7	11	1	2.4	1.6	8.8	4.8	2.0	2.8	5.8	0
8	12	1	3.9	2.2	9.1	4.6	3.0	2.5	8.3	0
9	13	1	2.8	1.4	8.1	3.8	2.1	1.4	6.6	1
10	14	1	3.7	1.5	8.6	5.7	2.7	3.7	6.7	0
11	15	1	4.7	1.3	9.9	6.7	3.0	2.6	6.8	0
12	17	1	3.2	4.1	5.7	5.1	3.6	2.9	6.2	0
13	20	1	4.7	1.3	9.9	6.7	3.0	2.6	6.8	0
14	23	1	3.0	4.0	9.1	7.1	3.5	3.4	8.4	0
15	24	1	2.4	1.5	6.7	4.8	1.9	2.5	7.2	1
16	25	1	5.1	1.4	8.7	4.8	3.3	2.6	3.8	0
17	26	1	4.6	2.1	7.9	5.8	3.4	2.8	4.7	0
18	28	1	5.2	1.3	9.7	6.1	3.2	3.9	6.7	0
19	29	1	3.5	2.8	9.9	3.5	3.1	1.7	5.4	0
20	31	1	3.0	3.2	6.0	5.3	3.1	3.0	8.0	1
21	32	1	2.8	3.8	8.9	6.9	3.3	3.2	8.2	0
22	33	1	5.2	2.0	9.3	5.9	3.7	2.4	4.6	0
23	36	1	1.8	3.3	7.5	4.5	2.5	2.4	7.6	1
24	39	1	0.0	2.1	6.9	5.4	1.1	2.6	8.9	1
25	42	1	5.9	0.9	9.6	7.8	3.4	4.6	4.5	0
26	43	1	4.9	2.3	9.3	4.5	3.6	1.3	6.2	0
27	45	1	2.0	2.6	6.5	3.7	2.4	1.7	8.5	1
28	47	1	3.1	1.9	10.0	4.5	2.6	3.2	3.8	0
29	48	1	3.4	3.9	5.6	5.6	3.6	2.3	9.1	1
30	49	1	5.8	0.2	8.8	4.5	3.0	2.4	6.7	0
31	50	1	5.4	2.1	8.0	3.0	3.8	1.4	5.2	0
32	51	1	3.7	0.7	8.2	6.0	2.1	2.5	5.2	0
33	52	1	2.6	4.8	8.2	5.0	3.6	2.5	9.0	1
34	53	1	4.5	4.1	6.3	5.9	4.3	3.4	8.8	1
35	54	1	2.8	2.4	6.7	4.9	2.5	2.6	9.2	1
36	58	1	5.4	2.5	9.6	5.5	4.0	3.0	7.7	0
37	59	1	4.3	1.8	7.6	5.4	3.1	2.5	4.4	0
38	61	1	3.1	1.9	9.9	4.5	2.6	3.1	3.8	0

Logistic Regression Homework

2

Obs	ID	Split60	X1	X2	X3	X4	X5	X6	X7	X11
39	65	1	1.1	2.0	7.2	4.7	1.6	3.2	10.0	1
40	67	1	4.2	2.5	9.2	6.2	3.3	3.9	7.3	0
41	68	1	1.6	4.5	6.4	5.3	3.0	2.5	7.1	1
42	70	1	2.3	3.7	8.3	5.2	3.0	2.3	9.1	1
43	71	1	3.6	5.4	5.9	6.2	4.5	2.9	8.4	1
44	72	1	5.6	2.2	8.2	3.1	4.0	1.6	5.3	0
45	73	1	3.6	2.2	9.9	4.8	2.9	1.9	4.9	0
46	79	1	1.0	1.9	7.1	4.5	1.5	3.1	9.9	1
47	80	1	4.5	1.6	8.7	4.6	3.1	2.1	6.8	0
48	81	1	5.5	1.8	8.7	3.8	3.6	2.1	4.9	0
49	82	1	3.4	4.6	5.5	8.2	4.0	4.4	6.3	0
50	84	1	2.3	3.7	7.6	5.0	3.0	2.5	7.4	0
51	86	1	2.5	3.1	7.0	4.2	2.8	2.2	9.0	1
52	88	1	2.1	3.5	7.4	4.8	2.8	2.3	7.2	0
53	89	1	2.9	1.2	7.3	6.1	2.0	2.5	8.0	1
54	90	1	4.3	2.5	9.3	6.3	3.4	4.0	7.4	0
55	92	1	4.8	1.7	7.6	4.2	3.3	1.4	5.8	0
56	93	1	3.1	4.2	5.1	7.8	3.6	4.0	5.9	0
57	95	1	4.0	0.5	6.7	4.5	2.2	2.1	5.0	0
58	96	1	0.6	1.6	6.4	5.0	0.7	2.1	8.4	1
59	97	1	6.1	0.5	9.2	4.8	3.3	2.8	7.1	0
60	99	1	3.1	2.2	6.7	6.8	2.6	2.9	8.4	1

Logistic Regression Homework

3

Obs	ID	Split60	X1	X2	X3	X4	X5	X6	X7	X11
1	3	0	3.4	5.2	5.7	6.0	4.3	2.7	8.2	1
2	4	0	2.7	1.0	7.1	5.9	1.8	2.3	7.8	1
3	9	0	5.5	1.6	9.4	4.7	3.5	3.0	7.6	0
4	10	0	4.0	3.5	6.5	6.0	3.7	3.2	8.7	1
5	16	0	3.4	2.0	9.7	4.7	2.7	1.7	4.8	0
6	18	0	4.9	1.8	7.7	4.3	3.4	1.5	5.9	0
7	19	0	5.3	1.4	9.7	6.1	3.3	3.9	6.8	0
8	21	0	3.3	0.9	8.6	4.0	2.1	1.8	6.3	0
9	22	0	3.4	0.4	8.3	2.5	1.2	1.7	5.2	0
10	27	0	2.4	1.5	6.6	4.8	1.9	2.5	7.2	1
11	30	0	4.1	3.7	5.9	5.5	3.9	3.0	8.4	1
12	34	0	3.4	3.7	6.4	5.7	3.5	3.4	8.4	1
13	35	0	2.4	1.0	7.7	3.4	1.7	1.1	6.2	1
14	37	0	3.6	4.0	5.8	5.8	3.7	2.5	9.3	1
15	38	0	4.0	0.9	9.1	5.4	2.4	2.6	7.3	0
16	40	0	2.4	2.0	6.4	4.5	2.1	2.2	8.8	1
17	41	0	1.9	3.4	7.6	4.6	2.6	2.5	7.7	1
18	44	0	5.0	1.3	8.6	4.7	3.1	2.5	3.7	0
19	46	0	5.0	2.5	9.4	4.6	3.7	1.4	6.3	0
20	55	0	3.8	0.8	8.7	2.9	1.6	2.1	5.6	0
21	56	0	2.9	2.6	7.7	7.0	2.8	3.6	7.7	0
22	57	0	4.9	4.4	7.4	6.9	4.6	4.0	9.6	1
23	60	0	2.3	4.5	8.0	4.7	3.3	2.2	8.7	1
24	62	0	5.1	1.9	9.2	5.8	3.6	2.3	4.5	0
25	63	0	4.1	1.1	9.3	5.5	2.5	2.7	7.4	0
26	64	0	3.0	3.8	5.5	4.9	3.4	2.6	6.0	0
27	66	0	3.7	1.4	9.0	4.5	2.6	2.3	6.8	0
28	69	0	5.3	1.7	8.5	3.7	3.5	1.9	4.8	0
29	74	0	5.2	1.3	9.1	4.5	3.3	2.7	7.3	0
30	75	0	3.0	2.0	6.6	6.6	2.4	2.7	8.2	1
31	76	0	4.2	2.4	9.4	4.9	3.2	2.7	8.5	0
32	77	0	3.8	0.8	8.3	6.1	2.2	2.6	5.3	0
33	78	0	3.3	2.6	9.7	3.3	2.9	1.5	5.2	0
34	83	0	1.6	2.8	6.1	6.4	2.3	3.8	8.2	1
35	85	0	2.6	3.0	8.5	6.0	2.8	2.8	6.8	1
36	87	0	2.4	2.9	8.4	5.9	2.7	2.7	6.7	1
37	91	0	3.0	2.8	7.8	7.1	3.0	3.8	7.9	0
38	94	0	1.9	2.7	5.0	4.9	2.2	2.5	8.2	1

Logistic Regression Homework

Obs	ID	Split60	X1	X2	X3	X4	X5	X6	X7	X11
39	98	0	2.0	2.8	5.2	5.0	2.4	2.7	8.4	1
40	100	0	2.5	1.8	9.0	5.0	2.2	3.0	6.0	0

The LOGISTIC Procedure

Model Information	
Data Set	WORK.HATCO60
Response Variable	X11
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	60
Number of Observations Used	60

Response Profile		
Ordered Value	X11	Total Frequency
1	0	38
2	1	22

Probability modeled is X11=0.

Stepwise Selection Procedure

Step 0. Intercept entered:

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

-2 Log L	=	78.859
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Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	0.5465	0.2679	4.1620	0.0413

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
41.4133	7	<.0001

The LOGISTIC Procedure

Analysis of Effects Eligible for Entry			
Effect	DF	Score Chi-Square	Pr > ChiSq
X1	1	27.4743	<.0001
X2	1	7.6323	0.0057
X3	1	21.2822	<.0001
X4	1	0.8389	0.3597
X5	1	9.2535	0.0024
X6	1	1.6299	0.2017
X7	1	30.0455	<.0001

Step 1. Effect X7 entered:

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

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	80.859	41.524
SC	82.953	45.713
-2 Log L	78.859	37.524

R-Square	0.4979	Max-rescaled R-Square	0.6808
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Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	41.3346	1	<.0001
Score	30.0455	1	<.0001
Wald	14.6788	1	0.0001

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	14.5818	3.7937	14.7738	0.0001
X7	1	-1.8958	0.4948	14.6788	0.0001

The LOGISTIC Procedure

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
X7	0.150	0.057	0.396

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	92.8	Somers' D	0.865
Percent Discordant	6.3	Gamma	0.872
Percent Tied	0.8	Tau-a	0.408
Pairs	836	c	0.932

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
19.5275	6	0.0034

Analysis of Effects Eligible for Removal			
Effect	DF	Wald Chi-Square	Pr > ChiSq
X7	1	14.6788	0.0001

Note: No effects for the model in Step 1 are removed.

Analysis of Effects Eligible for Entry			
Effect	DF	Score Chi-Square	Pr > ChiSq
X1	1	10.5073	0.0012
X2	1	0.2143	0.6434
X3	1	15.6104	<.0001
X4	1	4.9837	0.0256
X5	1	6.6675	0.0098
X6	1	6.4395	0.0112

Step 2. Effect X3 entered:

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

The LOGISTIC Procedure

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	80.859	26.258
SC	82.953	32.541
-2 Log L	78.859	20.258

R-Square	0.6234	Max-rescaled R-Square	0.8525
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Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	58.6006	2	<.0001
Score	37.2940	2	<.0001
Wald	7.2119	2	0.0272

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	8.3295	5.1098	2.6572	0.1031
X3	1	1.8306	0.7171	6.5168	0.0107
X7	1	-2.9126	1.1354	6.5809	0.0103

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
X3	6.237	1.530	25.433
X7	0.054	0.006	0.503

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	98.6	Somers' D	0.971
Percent Discordant	1.4	Gamma	0.971
Percent Tied	0.0	Tau-a	0.459
Pairs	836	c	0.986

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
11.4094	5	0.0438

The LOGISTIC Procedure

Analysis of Effects Eligible for Removal			
Effect	DF	Wald Chi-Square	Pr > ChiSq
X3	1	6.5168	0.0107
X7	1	6.5809	0.0103

Note: No effects for the model in Step 2 are removed.

Analysis of Effects Eligible for Entry			
Effect	DF	Score Chi-Square	Pr > ChiSq
X1	1	3.7460	0.0529
X2	1	3.6412	0.0564
X4	1	5.5574	0.0184
X5	1	8.8247	0.0030
X6	1	8.7708	0.0031

Step 3. Effect X5 entered:

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

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	80.859	14.254
SC	82.953	22.631
-2 Log L	78.859	6.254

R-Square	0.7018	Max-rescaled R-Square	0.9596
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Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	72.6053	3	<.0001
Score	40.0604	3	<.0001
Wald	2.4552	3	0.4834

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	-19.1378	21.1881	0.8158	0.3664
X3	1	6.7209	4.8016	1.9592	0.1616
X5	1	12.3108	9.3519	1.7329	0.1880
X7	1	-9.1659	6.5921	1.9333	0.1644

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
X3	829.557	0.068	>999.999
X5	>999.999	0.002	>999.999
X7	<0.001	<0.001	42.709

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	99.9	Somers' D	0.998
Percent Discordant	0.1	Gamma	0.998
Percent Tied	0.0	Tau-a	0.471
Pairs	836	c	0.999

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
4.3184	4	0.3646

Analysis of Effects Eligible for Removal			
Effect	DF	Wald Chi-Square	Pr > ChiSq
X3	1	1.9592	0.1616
X5	1	1.7329	0.1880
X7	1	1.9333	0.1644

Step 4. Effect X5 is removed:

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

The LOGISTIC Procedure

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
AIC	80.859	26.258
SC	82.953	32.541
-2 Log L	78.859	20.258

R-Square	0.6234	Max-rescaled R-Square	0.8525
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Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	58.6006	2	<.0001
Score	37.2940	2	<.0001
Wald	7.2119	2	0.0272

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	8.3295	5.1098	2.6572	0.1031
X3	1	1.8306	0.7171	6.5168	0.0107
X7	1	-2.9126	1.1354	6.5809	0.0103

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
X3	6.237	1.530	25.433
X7	0.054	0.006	0.503

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	98.6	Somers' D	0.971
Percent Discordant	1.4	Gamma	0.971
Percent Tied	0.0	Tau-a	0.459
Pairs	836	c	0.986

Residual Chi-Square Test		
Chi-Square	DF	Pr > ChiSq
11.4094	5	0.0438

The LOGISTIC Procedure

Analysis of Effects Eligible for Removal			
Effect	DF	Wald Chi-Square	Pr > ChiSq
X3	1	6.5168	0.0107
X7	1	6.5809	0.0103

Note: No effects for the model in Step 4 are removed.

Note: Model building terminates because the last effect entered is removed by the Wald statistic criterion.

Summary of Stepwise Selection							
Step	Effect		DF	Number In	Score Chi-Square	Wald Chi-Square	Pr > ChiSq
	Entered	Removed					
1	X7		1	1	30.0455		<.0001
2	X3		1	2	15.6104		<.0001
3	X5		1	3	8.8247		0.0030
4		X5	1	2		1.7329	0.1880

Partition for the Hosmer and Lemeshow Test					
Group	Total	X11 = 0		X11 = 1	
		Observed	Expected	Observed	Expected
1	6	0	0.01	6	5.99
2	6	0	0.05	6	5.95
3	6	0	0.65	6	5.35
4	6	3	3.04	3	2.96
5	6	6	4.39	0	1.61
6	6	5	5.89	1	0.11
7	6	6	5.97	0	0.03
8	6	6	6.00	0	0.00
9	6	6	6.00	0	0.00
10	6	6	6.00	0	0.00

Hosmer and Lemeshow Goodness-of-Fit Test		
Chi-Square	DF	Pr > ChiSq
10.3450	8	0.2416

The LOGISTIC Procedure

Classification Table									
Prob Level	Correct		Incorrect		Percentages				
	Event	Non- Event	Event	Non- Event	Correct	Sensi- tivity	Speci- ficity	False POS	False NEG
0.000	38	0	22	0	63.3	100.0	0.0	36.7	.
0.100	38	16	6	0	90.0	100.0	72.7	13.6	0.0
0.200	38	17	5	0	91.7	100.0	77.3	11.6	0.0
0.300	38	17	5	0	91.7	100.0	77.3	11.6	0.0
0.400	37	18	4	1	91.7	97.4	81.8	9.8	5.3
0.500	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.600	34	21	1	4	91.7	89.5	95.5	2.9	16.0
0.700	30	21	1	8	85.0	78.9	95.5	3.2	27.6
0.800	30	21	1	8	85.0	78.9	95.5	3.2	27.6
0.900	30	21	1	8	85.0	78.9	95.5	3.2	27.6
1.000	0	22	0	38	36.7	0.0	100.0	.	63.3

The LOGISTIC Procedure

Model Information	
Data Set	WORK.HATCO60
Response Variable	X11
Number of Response Levels	2
Model	binary logit
Optimization Technique	Fisher's scoring

Number of Observations Read	60
Number of Observations Used	60

Response Profile		
Ordered Value	X11	Total Frequency
1	0	38
2	1	22

Probability modeled is X11=0.

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

Model Fit Statistics		
Criterion	Intercept Only	Intercept and Covariates
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Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	58.6006	2	<.0001
Score	37.2940	2	<.0001
Wald	7.2119	2	0.0272

The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates					
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Intercept	1	8.3295	5.1098	2.6572	0.1031
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X7	1	-2.9126	1.1354	6.5809	0.0103

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
X3	6.237	1.530	25.433
X7	0.054	0.006	0.503

Association of Predicted Probabilities and Observed Responses			
Percent Concordant	98.6	Somers' D	0.971
Percent Discordant	1.4	Gamma	0.971
Percent Tied	0.0	Tau-a	0.459
Pairs	836	c	0.986

Partition for the Hosmer and Lemeshow Test					
Group	Total	X11 = 0		X11 = 1	
		Observed	Expected	Observed	Expected
1	6	0	0.01	6	5.99
2	6	0	0.05	6	5.95
3	6	0	0.65	6	5.35
4	6	3	3.04	3	2.96
5	6	6	4.39	0	1.61
6	6	5	5.89	1	0.11
7	6	6	5.97	0	0.03
8	6	6	6.00	0	0.00
9	6	6	6.00	0	0.00
10	6	6	6.00	0	0.00

Hosmer and Lemeshow Goodness-of-Fit Test		
Chi-Square	DF	Pr > ChiSq
10.3450	8	0.2416

The LOGISTIC Procedure

Classification Table									
Prob Level	Correct		Incorrect		Percentages				
	Event	Non- Event	Event	Non- Event	Correct	Sensi- tivity	Speci- ficity	False POS	False NEG
0.400	37	18	4	1	91.7	97.4	81.8	9.8	5.3
0.410	37	18	4	1	91.7	97.4	81.8	9.8	5.3
0.420	37	18	4	1	91.7	97.4	81.8	9.8	5.3
0.430	37	18	4	1	91.7	97.4	81.8	9.8	5.3
0.440	37	18	4	1	91.7	97.4	81.8	9.8	5.3
0.450	37	19	3	1	93.3	97.4	86.4	7.5	5.0
0.460	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.470	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.480	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.490	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.500	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.510	36	20	2	2	93.3	94.7	90.9	5.3	9.1
0.520	35	20	2	3	91.7	92.1	90.9	5.4	13.0
0.530	35	21	1	3	93.3	92.1	95.5	2.8	12.5
0.540	35	21	1	3	93.3	92.1	95.5	2.8	12.5
0.550	35	21	1	3	93.3	92.1	95.5	2.8	12.5
0.560	35	21	1	3	93.3	92.1	95.5	2.8	12.5
0.570	35	21	1	3	93.3	92.1	95.5	2.8	12.5
0.580	35	21	1	3	93.3	92.1	95.5	2.8	12.5
0.590	34	21	1	4	91.7	89.5	95.5	2.9	16.0
0.600	34	21	1	4	91.7	89.5	95.5	2.9	16.0

Logistic Regression Homework

17

Obs	X3	X7	X11	F_X11	I_X11	P_0	P_1
1	6.9	5.2	0	0	0	0.99703	0.00297
2	6.3	8.4	1	1	1	0.00992	0.99008
3	9.6	4.5	0	0	0	1.00000	0.00000
4	7.9	9.7	1	1	1	0.00423	0.99577
5	9.5	7.6	0	0	0	0.97300	0.02700
6	6.2	6.9	1	1	1	0.39707	0.60293
7	8.8	5.8	0	0	0	0.99947	0.00053
8	9.1	8.3	0	0	0	0.69283	0.30717
9	8.1	6.6	1	1	0	0.98081	0.01919
10	8.6	6.7	0	0	0	0.98963	0.01037
11	9.9	6.8	0	0	0	0.99870	0.00130
12	5.7	6.2	0	0	0	0.66948	0.33052
13	9.9	6.8	0	0	0	0.99870	0.00130
14	9.1	8.4	0	0	0	0.62764	0.37236
15	6.7	7.2	1	1	1	0.40705	0.59295
16	8.7	3.8	0	0	0	1.00000	0.00000
17	7.9	4.7	0	0	0	0.99989	0.00011
18	9.7	6.7	0	0	0	0.99860	0.00140
19	9.9	5.4	0	0	0	0.99998	0.00002
20	6.0	8.0	1	1	1	0.01821	0.98179
21	8.9	8.2	0	0	0	0.67667	0.32333
22	9.3	4.6	0	0	0	0.99999	0.00001
23	7.5	7.6	1	1	1	0.48082	0.51918
24	6.9	8.9	1	1	1	0.00695	0.99305
25	9.6	4.5	0	0	0	1.00000	0.00000
26	9.3	6.2	0	0	0	0.99932	0.00068
27	6.5	8.5	1	1	1	0.01068	0.98932
28	10.0	3.8	0	0	0	1.00000	0.00000
29	5.6	9.1	1	1	1	0.00036	0.99964
30	8.8	6.7	0	0	0	0.99278	0.00722
31	8.0	5.2	0	0	0	0.99960	0.00040
32	8.2	5.2	0	0	0	0.99972	0.00028
33	8.2	9.0	1	1	1	0.05351	0.94649
34	6.3	8.8	1	1	1	0.00311	0.99689
35	6.7	9.2	1	1	1	0.00202	0.99798
36	9.6	7.7	0	0	0	0.97000	0.03000
37	7.6	4.4	0	0	0	0.99992	0.00008
38	9.9	3.8	0	0	0	1.00000	0.00000

Obs	X3	X7	X11	F_X11	I_X11	P_0	P_1
39	7.2	10.0	1	1	1	0.00049	0.99951
40	9.2	7.3	0	0	0	0.98033	0.01967
41	6.4	7.1	1	1	1	0.34658	0.65342
42	8.3	9.1	1	1	1	0.04829	0.95171
43	5.9	8.4	1	1	1	0.00479	0.99521
44	8.2	5.3	0	0	0	0.99963	0.00037
45	9.9	4.9	0	0	0	0.99999	0.00001
46	7.1	9.9	1	1	1	0.00055	0.99945
47	8.7	6.8	0	0	0	0.98846	0.01154
48	8.7	4.9	0	0	0	0.99995	0.00005
49	5.5	6.3	0	0	0	0.51211	0.48789
50	7.6	7.4	0	0	0	0.66571	0.33429
51	7.0	9.0	1	1	1	0.00625	0.99375
52	7.4	7.2	0	0	0	0.71202	0.28798
53	7.3	8.0	1	1	1	0.16688	0.83312
54	9.3	7.4	0	0	0	0.97814	0.02186
55	7.6	5.8	0	0	0	0.99527	0.00473
56	5.1	5.9	0	0	0	0.61804	0.38196
57	6.7	5.0	0	0	0	0.99760	0.00240
58	6.4	8.4	1	1	1	0.01189	0.98811
59	9.2	7.1	0	0	0	0.98892	0.01108
60	6.7	8.4	1	1	1	0.02041	0.97959

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of F_X11 by I_X11			
	F_X11(From: X11)	I_X11(Into: X11)		
		0	1	Total
	0	38 63.33 100.00 97.44	0 0.00 0.00 0.00	38 63.33
	1	1 1.67 4.55 2.56	21 35.00 95.45 100.00	22 36.67
	Total	39 65.00	21 35.00	60 100.00

Logistic Regression Homework

20

Obs	X3	X7	X11	F_X11	I_X11	P_0	P_1
1	5.7	8.2	1	1	1	0.00594	0.99406
2	7.1	7.8	1	1	1	0.19917	0.80083
3	9.4	7.6	0	0	0	0.96775	0.03225
4	6.5	8.7	1	1	1	0.00599	0.99401
5	9.7	4.8	0	0	0	0.99999	0.00001
6	7.7	5.9	0	0	0	0.99473	0.00527
7	9.7	6.8	0	0	0	0.99813	0.00187
8	8.6	6.3	0	0	0	0.99674	0.00326
9	8.3	5.2	0	0	0	0.99977	0.00023
10	6.6	7.2	1	1	1	0.36372	0.63628
11	5.9	8.4	1	1	1	0.00479	0.99521
12	6.4	8.4	1	1	1	0.01189	0.98811
13	7.7	6.2	1	1	0	0.98747	0.01253
14	5.8	9.3	1	1	1	0.00029	0.99971
15	9.1	7.3	0	0	0	0.97648	0.02352
16	6.4	8.8	1	1	1	0.00374	0.99626
17	7.6	7.7	1	1	1	0.45389	0.54611
18	8.6	3.7	0	0	0	1.00000	0.00000
19	9.4	6.3	0	0	0	0.99924	0.00076
20	8.7	5.6	0	0	0	0.99965	0.00035
21	7.7	7.7	0	0	1	0.49953	0.50047
22	7.4	9.6	1	1	1	0.00227	0.99773
23	8.0	8.7	1	1	1	0.08586	0.91414
24	9.2	4.5	0	0	0	0.99999	0.00001
25	9.3	7.4	0	0	0	0.97814	0.02186
26	5.5	6.0	0	0	0	0.71549	0.28451
27	9.0	6.8	0	0	0	0.99330	0.00670
28	8.5	4.8	0	0	0	0.99995	0.00005
29	9.1	7.3	0	0	0	0.97648	0.02352
30	6.6	8.2	1	1	1	0.03013	0.96987
31	9.4	8.5	0	0	0	0.68569	0.31431
32	8.3	5.3	0	0	0	0.99969	0.00031
33	9.7	5.2	0	0	0	0.99998	0.00002
34	6.1	8.2	1	1	1	0.01228	0.98772
35	8.5	6.8	1	1	0	0.98344	0.01656
36	8.4	6.7	1	1	0	0.98511	0.01489
37	7.8	7.9	0	0	1	0.40099	0.59901
38	5.0	8.2	1	1	1	0.00166	0.99834

Obs	X3	X7	X11	F_X11	I_X11	P_0	P_1
39	5.2	8.4	1	1	1	0.00134	0.99866
40	9.0	6.0	0	0	0	0.99934	0.00066

The FREQ Procedure

Frequency Percent Row Pct Col Pct	Table of F_X11 by I_X11			
	F_X11(From: X11)	I_X11(Into: X11)		
		0	1	Total
	0	20	2	22
		50.00	5.00	55.00
		90.91	9.09	
		86.96	11.76	
	1	3	15	18
		7.50	37.50	45.00
		16.67	83.33	
		13.04	88.24	
	Total	23	17	40
		57.50	42.50	100.00