MATH 523: EXAMPLES - POISSON DATA SETS

POISSON REGRESSION: COVARIATES AND FACTOR PREDICTORS:

EXAMPLE: Scottish Lip Cancer data

District	Observed y	Expected E	%AFF X_1	Lat. X_2	Long. X_3
1	9	1.4	16	57.29	5.50
2	39	8.7	16	57.56	2.36
3	11	3.0	10	58.44	3.90
4	9	2.5	24	55.76	2.40
5	15	4.3	10	57.71	5.09
6	8	2.4	24	59.13	3.25
7	26	8.1	10	57.47	3.30
8	7	2.3	7	60.24	1.43
9	6	2.0	7	56.90	5.42
10	20	6.6	16	57.24	2.60
11	13	4.4	7	58.12	6.80
12	5	1.8	16	58.06	4.64
13	3	1.1	10	57.47	3.98
14	8	3.3	24	54.94	5.00
15	17	7.8	7	56.30	3.10
16	9	4.6	16	57.00	3.00
17	2	1.1	10	57.06	4.09
18	7	4.2	7	55.65	2.88
19	9	5.5	7	57.24	4.73
20	7	4.4	10	55.35	2.90
21	16	10.5	7	56.75	2.98
22	31	22.7	16	57.12	2.20
23	11	8.8	10	56.40	5.27
24	7	5.6	7	55.63	3.96
25	19	15.5	1	56.20	3.30
26	15	12.5	1	56.10	3.60
27	7	6.0	7	55.24	4.09
28	10	9.0	7	55.95	2.80
29	16	14.4	10	56.60	4.09
30	11	10.2	10	55.90	3.80
31	5	4.8	7	55.47	4.55
32	3	2.9	24	55.00	4.36
33	7	7.0	10	55.83	3.20
34	8	8.5	7	56.30	4.73
35	11	12.3	7	55.29	4.98
36	9	10.1	0	55.94	4.95
37	11	12.7	10	55.76	5.02
38	8	9.4	1	55.91	4.18
39	6	7.2	16	56.15	4.99
40	4	5.3	0	56.05	4.91
41	10	18.8	1	55.88	4.82
42	8	15.8	16	56.03	4.00
43	2	4.3	16	56.15	3.96
44	6	14.6	0	55.82	4.09
45	19	50.7	1	55.93	3.40
46	3	8.2	7	55.65	4.75
47	2	5.6	1	55.71	4.45
48	3	9.3	1	55.79	4.27
49	28	88.7	0	55.90	4.55
50	6	19.6	1	56.45	3.20
51	1	3.4	1	56.00	4.27
52	1	3.6	0	56.15	4.64
53	1	5.7	1	55.79	4.70
54	1	7.0	1	55.99	4.45
55	0	4.2	16	55.68	3.38
56	0	1.8	10	55.18	3.40

- Column 1: District number
- Column 2: Observed number of cases
- Column 3: Expected number of cases
- Column 4: Percent working in Agriculture, Fisheries, or Forestry (see text)
- Column 5: Latitude
- Column 6: Longitude

DATA BASED ON FACTOR PREDICTORS

TWO-WAY CONTINGENCY TABLES: Cross-classification by **two** factor predictors, no obvious response variable.

EXAMPLE: Political Affiliations of College Students: A 4×3 two-way table.

		Affiliation			
		Rep.	Dem.	Ind.	Total
College	Letters	34	61	16	111
	Engineering	31	19	17	67
	Agriculture	19	23	16	58
	Education	23	39	12	74
	Total	107	142	61	310

- Factor 1: College Type (4 levels)
- Factor 2: Political affiliation (3 levels)

MULTI-WAY CONTINGENCY TABLES: Cross-classification by **multiple** factor predictors, no obvious response variable.

EXAMPLE: Classroom behaviour data: A $2 \times 2 \times 3$ multiway table.

		Adversity						
		Low		Med		High		
	Risk	N	Y	N	Y	N	Y	Total
Behaviour	Non-deviant	16	7	15	34	5	3	80
	Deviant	1	1	3	8	1	3	17
	Total	17	8	18	42	6	6	97

- Factor 1: Classroom behaviour type: 1-Non-Deviant, 2-Deviant
- Factor 2: Risk at Home: Y-At Risk, N-Not at Risk
- Factor 3: Adversity of School: 1-Low, 2-Medium, 3-High.