Exercises, lecture 5

5. marts 2009

Exercise 1 Problem 22.4.11 in the book. Also, find the p-value.

Exercise 2 Problem 22.3.7 in the book. Also, test the hypothesis $H_0 : \mu = 12.2$ at 5% level of significance. What is the p-value?

Exercise 3 Redo the previous exercise without knowledge of the variance.

Exercise 4 Data below is the pulse of 10 students before and after learning an exciting new statistics formula. Is there a significant change in the pulse? Give a 99% confidence interval for the average change in pulse.

Before:	75	84	72	75	72	79	79	81	74	73
After:	76	86	71	76	78	78	79	83	76	76

Exercise 5 Assume we have 30 measurements of, t, the mid-day temperature and, n, the number of people going to the hospital with dehydration symptoms. Assume the following is calculated from data: The average temperature is 22.4 and the average number of people with dehydration symptoms is 111.4. Furthermore, $s_t^2 = 10.5$, $s_n^2 = 4.0$ and $s_{tn} = 5.7$.

1. Estimate a regression model for dehydration given temperature.
2. Is there a significant influence of the temperature? What is the p-value for the influence?
3. Find confidence intervals for both regression parameters.
4. Calculate the coefficient of determination.

Exercise 6 Unfinished exercises from previous lectures.

Tables for distribution functions

Tables of numbers x_p such that $P(X \leq x_p) = p$.

Standard normal distribution

p	0.005	0.01	0.025	0.05	0.10	0.25	0.50	0.75	0.90	0.95	0.975	0.99	0.995
	-2.58	-2.33	-1.96	-1.64	-1.28	-0.67	0.00	0.67	1.28	1.64	1.96	2.33	2.58

t-distribution

$n\backslash p$	0.005	0.01	0.025	0.05	0.10	0.25	0.50	0.75	0.90	0.95	0.975	0.99	0.995
8	-3.36	-2.90	-2.31	-1.86	-1.40	-0.71	0.00	0.71	1.40	1.86	2.31	2.90	3.36
9	-3.25	-2.82	-2.26	-1.83	-1.38	-0.70	0.00	0.70	1.38	1.83	2.26	2.82	3.25
10	-3.17	-2.76	-2.23	-1.81	-1.37	-0.70	0.00	0.70	1.37	1.81	2.23	2.76	3.17
18	-2.88	-2.55	-2.10	-1.73	-1.33	-0.69	0.00	0.69	1.33	1.73	2.10	2.55	2.88
19	-2.86	-2.54	-2.09	-1.73	-1.33	-0.69	0.00	0.69	1.33	1.73	2.09	2.54	2.86
20	-2.85	-2.53	-2.09	-1.72	-1.33	-0.69	0.00	0.69	1.33	1.72	2.09	2.53	2.85
28	-2.76	-2.47	-2.05	-1.70	-1.31	-0.68	0.00	0.68	1.31	1.70	2.05	2.47	2.76
29	-2.76	-2.46	-2.05	-1.70	-1.31	-0.68	0.00	0.68	1.31	1.70	2.05	2.46	2.76
30	-2.75	-2.46	-2.04	-1.70	-1.31	-0.68	0.00	0.68	1.31	1.70	2.04	2.46	2.75
48	-2.68	-2.41	-2.01	-1.68	-1.30	-0.68	0.00	0.68	1.30	1.68	2.01	2.41	2.68
49	-2.68	-2.40	-2.01	-1.68	-1.30	-0.68	0.00	0.68	1.30	1.68	2.01	2.40	2.68
50	-2.68	-2.40	-2.01	-1.68	-1.30	-0.68	0.00	0.68	1.30	1.68	2.01	2.40	2.68
98	-2.63	-2.37	-1.98	-1.66	-1.29	-0.68	0.00	0.68	1.29	1.66	1.98	2.37	2.63
99	-2.63	-2.36	-1.98	-1.66	-1.29	-0.68	0.00	0.68	1.29	1.66	1.98	2.36	2.63
100	-2.63	-2.36	-1.98	-1.66	-1.29	-0.68	0.00	0.68	1.29	1.66	1.98	2.36	2.63

χ^2-distribution

$n\backslash p$	0.10	0.25	0.50	0.75	0.90	0.95	0.975	0.99	0.995	0.999	0.9999
1	0.02	0.10	0.45	1.32	2.71	3.84	5.02	6.63	7.88	10.83	15.14
2	0.21	0.58	1.39	2.77	4.61	5.99	7.38	9.21	10.60	13.82	18.42
3	0.58	1.21	2.37	4.11	6.25	7.81	9.35	11.34	12.84	16.27	21.11
4	1.06	1.92	3.36	5.39	7.78	9.49	11.14	13.28	14.86	18.47	23.51
5	1.61	2.67	4.35	6.63	9.24	11.07	12.83	15.09	16.75	20.52	25.74
6	2.20	3.45	5.35	7.84	10.64	12.59	14.45	16.81	18.55	22.46	27.86
7	2.83	4.25	6.35	9.04	12.02	14.07	16.01	18.48	20.28	24.32	29.88
8	3.49	5.07	7.34	10.22	13.36	15.51	17.53	20.09	21.95	26.12	31.83
9	4.17	5.90	8.34	11.39	14.68	16.92	19.02	21.67	23.59	27.88	33.72
10	4.87	6.74	9.34	12.55	15.99	18.31	20.48	23.21	25.19	29.59	35.56
11	5.58	7.58	10.34	13.70	17.28	19.68	21.92	24.72	26.76	31.26	37.37
12	6.30	8.44	11.34	14.85	18.55	21.03	23.34	26.22	28.30	32.91	39.13
13	7.04	9.30	12.34	15.98	19.81	22.36	24.74	27.69	29.82	34.53	40.87
14	7.79	10.17	13.34	17.12	21.06	23.68	26.12	29.14	31.32	36.12	42.58
15	8.55	11.04	14.34	18.25	22.31	25.00	27.49	30.58	32.80	37.70	44.26