

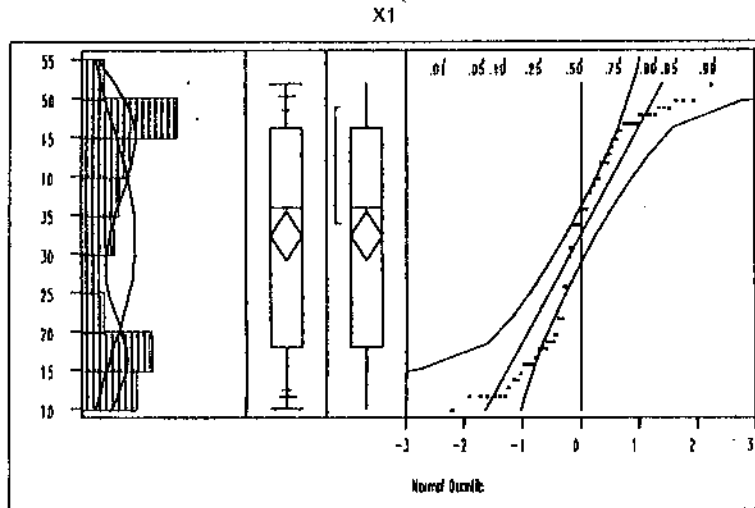
# 國立臺北大學九十一學年度碩士班招生考試試題

系(所)別:地政學系  
科 目:統計學

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第一頁

可 不可使用計算機

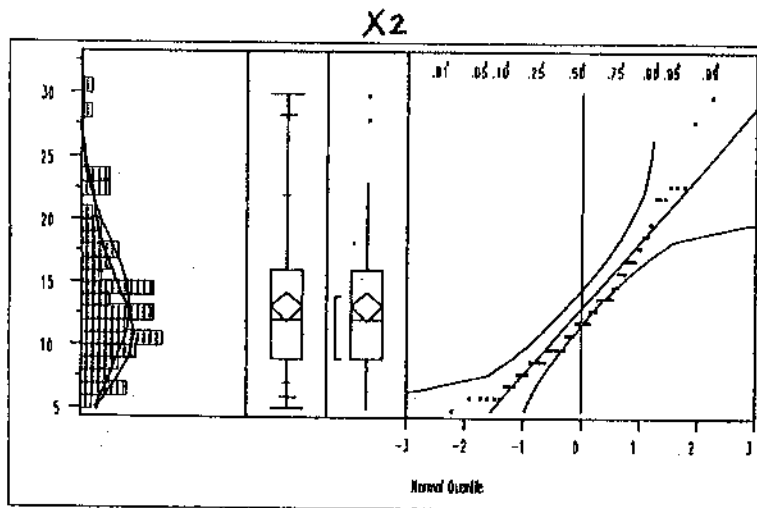
一、以下為二個隨機變數  $x_1$  與  $x_2$  之敘述性統計量輸出結果,請依據輸出報表所提供資訊,對每一個變數的基本特性,包括集中趨勢度、離散趨勢度、偏態、峰度、常態性等,作一統計敘述。(20%)



Quantiles		
maximum	100.0%	52.0
	99.5%	52.0
	97.5%	50.0
	90.0%	48.0
quartile	75.0%	46.0
median	50.0%	36.0
quartile	25.0%	18.0
	10.0%	12.0
	2.5%	11.0
	0.5%	10.0
minimum	0.0%	10.0

Moments	
Mean	32.38
Std Dev	13.85
Std Error Mean	1.60
Upper 95% Mean	35.58
Lower 95% Mean	29.14
N	74.00
Sum Weights	74.00
Sum	2404.00
Variance	191.36
Skewness	-0.21
Kurtosis	-1.55
CV	42.76

Test for Normality	
Shapiro-Wilk W Test	
W	Prob<W
0.864090	<.0001



Quantiles		
maximum	100.0%	30.00
	99.5%	30.00
	97.5%	28.25
	90.0%	22.00
quartile	75.0%	16.00
median	50.0%	12.00
quartile	25.0%	9.00
	10.0%	7.00
	2.5%	5.87
	0.5%	5.00
minimum	0.0%	5.00

Moments	
Mean	13.0678
Std Dev	5.3078
Std Error Mean	0.6170
Upper 95% Mean	14.2973
Lower 95% Mean	11.8378
N	74.0000
Sum Weights	74.0000
Sum	967.0000
Variance	28.1734
Skewness	0.9785
Kurtosis	0.8702
CV	40.6188

Test for Normality	
Shapiro-Wilk W Test	
W	Prob<W
0.925518	0.0002

land 917-1

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可 不可使用計算

二、設  $S_1^2$  與  $S_2^2$  分別是隨機獨立抽樣自 N.D.  $(\mu_1, 5)$  與 N.D.  $(\mu_2, 8)$  的兩組樣本的樣本變異數，其樣本數分別是  $n_1=21$  與  $n_2=31$ ，試計算：(20%)

- (1)  $S_1^2/S_2^2$  值大於 1.2073125 之機率值。
- (2)  $S_1^2/S_2^2$  值介於 1.372 與 1.764375 之間的機率值。



$1-\alpha = 0.95$

$\frac{v_2}{v_1}$	10	12	15	20
1	241.28	243.92	245.95	248.01
2	19.296	19.413	19.425	19.448
3	3.7855	3.7416	3.7020	3.6622
4	3.0644	3.0117	2.9703	2.9285
5	2.7391	2.6777	2.6350	2.5911
6	2.5000	2.4399	2.3961	2.3512
7	2.3395	2.2797	2.2350	2.1901
8	2.2342	2.1746	2.1299	2.0850
9	2.1733	2.1138	2.0691	2.0242
10	2.1305	2.0710	2.0263	1.9814
11	2.0966	2.0371	1.9924	1.9475
12	2.0698	2.0103	1.9656	1.9207
13	2.0481	1.9886	1.9439	1.8990
14	2.0305	1.9710	1.9263	1.8814
15	2.0160	1.9565	1.9118	1.8669
16	2.0040	1.9445	1.8998	1.8549
17	1.9938	1.9343	1.8896	1.8447
18	1.9851	1.9256	1.8809	1.8360
19	1.9776	1.9181	1.8734	1.8285
20	1.9712	1.9117	1.8670	1.8221
21	1.9657	1.9062	1.8615	1.8166
22	1.9610	1.9015	1.8568	1.8119
23	1.9570	1.8975	1.8528	1.8072
24	1.9536	1.8941	1.8494	1.8038
25	1.9507	1.8912	1.8465	1.8009
26	1.9482	1.8887	1.8440	1.7984
27	1.9460	1.8865	1.8418	1.7962
28	1.9441	1.8846	1.8400	1.7943
29	1.9424	1.8830	1.8384	1.7927
30	1.9409	1.8816	1.8370	1.7913
31	1.9396	1.8803	1.8357	1.7900
32	1.9384	1.8792	1.8345	1.7888
33	1.9374	1.8782	1.8334	1.7877
34	1.9365	1.8773	1.8324	1.7867
35	1.9357	1.8765	1.8315	1.7858
36	1.9350	1.8757	1.8306	1.7849
37	1.9344	1.8750	1.8298	1.7841
38	1.9338	1.8743	1.8290	1.7833
39	1.9333	1.8737	1.8283	1.7826
40	1.9328	1.8731	1.8276	1.7819
41	1.9324	1.8726	1.8270	1.7813
42	1.9320	1.8721	1.8264	1.7807
43	1.9316	1.8716	1.8259	1.7802
44	1.9312	1.8712	1.8254	1.7797
45	1.9308	1.8708	1.8249	1.7792
46	1.9305	1.8704	1.8244	1.7788
47	1.9302	1.8700	1.8240	1.7784
48	1.9300	1.8696	1.8236	1.7780
49	1.9297	1.8693	1.8232	1.7776
50	1.9295	1.8690	1.8228	1.7773
100	1.9270	1.8665	1.8210	1.7755
∞	1.9267	1.8664	1.8208	1.7754

$1-\alpha = 0.975$

$\frac{v_2}{v_1}$	10	12	15	20
1	496.61	478.71	464.01	450.10
2	39.360	39.415	39.431	39.446
3	14.439	14.337	14.263	14.197
4	9.8439	9.7512	9.6855	9.6299
5	8.0192	7.9248	7.8777	7.8283
6	6.8613	6.7662	6.7287	6.6884
7	6.0781	5.9830	5.9455	5.9052
8	5.5791	5.4840	5.4465	5.4062
9	5.1929	5.1078	5.0703	5.0300
10	4.8803	4.7952	4.7577	4.7174
11	4.6257	4.5406	4.5031	4.4628
12	4.4103	4.3252	4.2877	4.2474
13	4.2200	4.1349	4.0974	4.0571
14	4.0511	3.9660	3.9285	3.8882
15	3.9000	3.8149	3.7774	3.7371
16	3.7643	3.6792	3.6417	3.6014
17	3.6417	3.5566	3.5191	3.4788
18	3.5307	3.4456	3.4081	3.3678
19	3.4299	3.3448	3.3073	3.2670
20	3.3381	3.2530	3.2155	3.1752
21	3.2543	3.1692	3.1317	3.0914
22	3.1776	3.0925	3.0550	3.0147
23	3.1071	3.0220	2.9845	2.9442
24	3.0420	2.9569	2.9194	2.8791
25	2.9815	2.8964	2.8589	2.8186
26	2.9248	2.8397	2.8022	2.7619
27	2.8713	2.7862	2.7487	2.7084
28	2.8204	2.7353	2.6978	2.6575
29	2.7717	2.6866	2.6491	2.6088
30	2.7249	2.6398	2.6023	2.5620
31	2.6800	2.5949	2.5574	2.5171
32	2.6367	2.5516	2.5141	2.4738
33	2.5949	2.5098	2.4723	2.4320
34	2.5545	2.4694	2.4319	2.3916
35	2.5154	2.4303	2.3928	2.3525
36	2.4775	2.3924	2.3549	2.3146
37	2.4407	2.3556	2.3181	2.2778
38	2.4050	2.3199	2.2824	2.2421
39	2.3703	2.2852	2.2477	2.2074
40	2.3366	2.2515	2.2140	2.1737
41	2.3038	2.2187	2.1812	2.1409
42	2.2719	2.1868	2.1493	2.1090
43	2.2409	2.1558	2.1183	2.0780
44	2.2107	2.1256	2.0881	2.0478
45	2.1813	2.0962	2.0587	2.0184
46	2.1526	2.0675	2.0300	1.9897
47	2.1246	2.0395	2.0020	1.9617
48	2.0973	2.0122	1.9747	1.9344
49	2.0706	1.9855	1.9480	1.9077
50	2.0445	1.9594	1.9219	1.8816
100	2.0170	1.9319	1.8944	1.8541
∞	2.0163	1.9447	1.8920	1.8517

$1-\alpha = 0.99$

$\frac{v_2}{v_1}$	10	12	15	20
1	1626.8	1606.3	1591.3	1576.3
2	99.296	99.416	99.432	99.446
3	27.336	27.062	26.872	26.680
4	14.446	14.374	14.316	14.262
5	10.857	10.803	10.752	10.702
6	8.7874	8.743	8.699	8.656
7	7.6221	7.588	7.551	7.515
8	6.8908	6.862	6.831	6.798
9	6.3745	6.350	6.323	6.291
10	5.9565	5.936	5.913	5.884
11	5.6129	5.596	5.576	5.550
12	5.3313	5.318	5.299	5.276
13	5.1003	5.089	5.072	5.051
14	4.9100	4.900	4.884	4.864
15	4.7511	4.743	4.728	4.709
16	4.6143	4.608	4.594	4.576
17	4.4978	4.493	4.480	4.463
18	4.3999	4.396	4.384	4.368
19	4.3181	4.316	4.305	4.290
20	4.2413	4.240	4.230	4.216
21	4.1694	4.169	4.160	4.147
22	4.1014	4.102	4.094	4.082
23	4.0373	4.038	4.031	4.020
24	3.9761	3.978	3.972	3.962
25	3.9178	3.920	3.915	3.906
26	3.8623	3.865	3.861	3.852
27	3.8094	3.812	3.808	3.800
28	3.7590	3.762	3.758	3.750
29	3.7110	3.714	3.710	3.702
30	3.6652	3.668	3.664	3.656
31	3.6215	3.624	3.620	3.612
32	3.5798	3.582	3.578	3.570
33	3.5399	3.542	3.538	3.530
34	3.4998	3.502	3.498	3.490
35	3.4595	3.462	3.458	3.450
36	3.4190	3.422	3.418	3.410
37	3.3783	3.381	3.377	3.369
38	3.3374	3.340	3.336	3.328
39	3.2963	3.299	3.295	3.287
40	3.2550	3.258	3.254	3.246
41	3.2135	3.216	3.212	3.204
42	3.1718	3.174	3.170	3.162
43	3.1299	3.132	3.128	3.120
44	3.0878	3.090	3.086	3.078
45	3.0455	3.048	3.044	3.036
46	3.0030	3.006	3.002	2.994
47	2.9603	2.963	2.959	2.951
48	2.9174	2.920	2.916	2.908
49	2.8743	2.877	2.873	2.865
50	2.8310	2.834	2.830	2.822
100	2.7710	2.774	2.770	2.762
∞	2.7700	2.774	2.770	2.762

$1-\alpha = 0.995$

$\frac{v_2}{v_1}$	10	12	15	20
1	5041.4	4920.9	4800.3	4680.8
2	199.47	199.42	199.43	199.44
3	49.086	48.987	48.985	48.984
4	20.987	20.906	20.839	20.777
5	13.818	13.764	13.716	13.673
6	10.285	10.241	10.200	10.162
7	8.2833	8.248	8.214	8.181
8	7.2107	7.181	7.153	7.126
9	6.4171	6.393	6.369	6.346
10	5.8487	5.826	5.804	5.782
11	5.4182	5.398	5.378	5.358
12	5.0655	5.047	5.029	5.011
13	4.7719	4.755	4.738	4.721
14	4.5284	4.513	4.498	4.483
15	4.3249	4.310	4.296	4.282
16	4.1514	4.138	4.125	4.112
17	4.0079	3.995	3.983	3.971
18	3.8844	3.873	3.862	3.851
19	3.7799	3.770	3.760	3.750
20	3.6924	3.684	3.675	3.666
21	3.6209	3.613	3.605	3.597
22	3.5644	3.557	3.550	3.542
23	3.5129	3.506	3.500	3.493
24	3.4654	3.459	3.453	3.447
25	3.4219	3.416	3.410	3.404
26	3.3824	3.377	3.371	3.365
27	3.3469	3.342	3.336	3.330
28	3.3144	3.310	3.304	3.298
29	3.2849	3.280	3.274	3.268
30	3.2574	3.253	3.247	3.241
31	3.2319	3.227	3.221	3.215
32	3.2084	3.204	3.198	3.192
33	3.1859	3.181	3.175	3.169
34	3.1644	3.160	3.154	3.148
35	3.1439	3.139	3.133	3.127
36	3.1244	3.120	3.114	3.108
37	3.1059	3.101	3.095	3.089
38	3.0884	3.084	3.078	3.072
39	3.0719	3.067	3.061	3.055
40	3.0564	3.052	3.046	3.040
41	3.0419	3.037	3.031	3.025
42	3.0284	3.024	3.018	3.012
43	3.0159	3.011	3.005	2.999
44	3.0044	3.000	2.994	2.988
45	2.9939	2.989	2.983	2.977
46	2.9844	2.980	2.974	2.968
47	2.9759	2.971	2.965	2.959
48	2.9684	2.964	2.958	2.952
49	2.9619	2.957	2.951	2.945
50	2.9564	2.952	2.946	2.940
100	2.9370	2.933		

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第三頁

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Response: Yleid  
Summary of Fit

RSquare	0.997042
RSquare Adj	0.996487
Root Mean Square Error	1.151297
Mean of Response	41.65
Observations (or Sum Wgts)	20

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	-3.933359	0.677893	-5.80	<.0001
Aperture	-0.690326	0.090146	-7.66	<.0001
Ranglng	-0.645415	0.11092	-5.82	<.0001
Cadence	2.7671467	0.094221	29.37	<.0001

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Aperture	1	1	77.7303	58.6430	<.0001
Ranglng	1	1	44.8782	33.8580	<.0001
Cadence	1	1	1143.2454	862.5119	<.0001

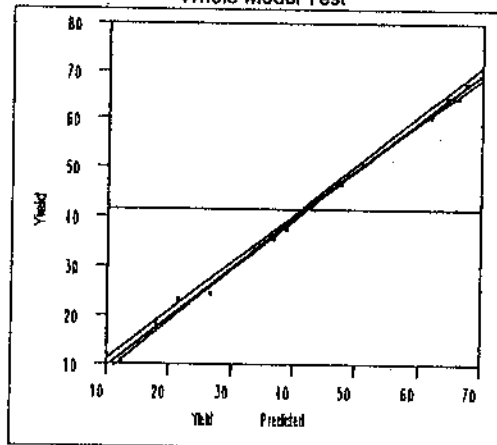
Durbin-Watson

Durbin-Watson	Number of Obs.	AutoCorrelation
1.8870545	20	0.0164

Correlation of Estimates

Corr	Intercept	Aperture	Ranglng	Cadence
Intercept	1.0000	0.1130	0.1825	-0.437
Aperture	0.1130	1.0000	0.6529	-0.846
Ranglng	0.1825	0.6529	1.0000	-0.883
Cadence	-0.437	-0.846	-0.883	1.0000

Whole-Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	7147.3423	2382.45	1797.417
Error	16	21.2077	1.33	Prob>F
C Total	19	7168.5500		<.0001

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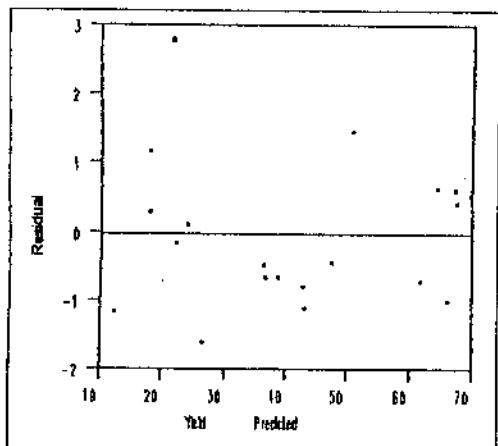
共四頁

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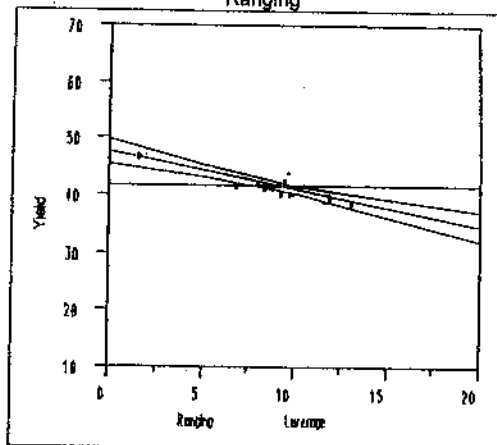
第四頁

可 不可使用計算機

Residual Plot

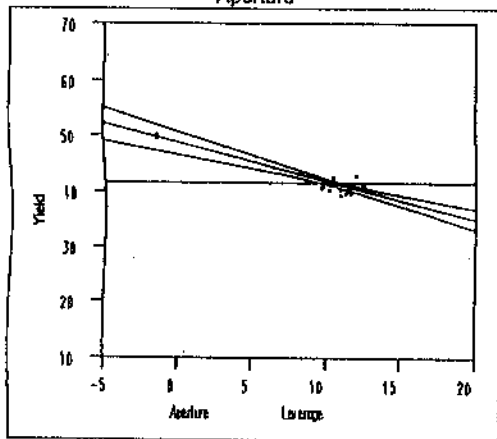


Ranging



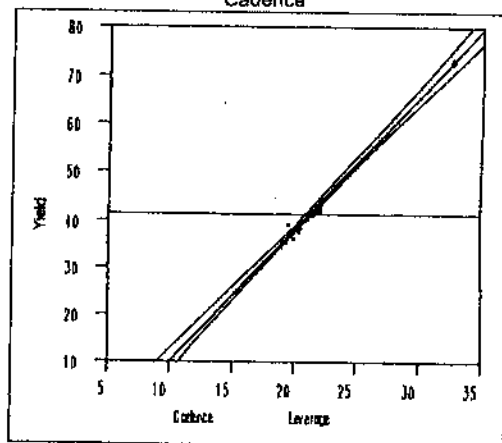
Effect Test			
Sum of Squares	F Ratio	DF	Prob>F
44.878171	33.8580	1	<.0001

Aperture



Effect Test			
Sum of Squares	F Ratio	DF	Prob>F
77.730344	58.6430	1	<.0001

Cadence



Effect Test			
Sum of Squares	F Ratio	DF	Prob>F
1143.2454	862.5119	1	<.0001

四、某立委參選人從其選區抽出 1000 位簡單隨機樣本 (SRS) 選民，其中 570

位表示支持其競選連任，即  $\hat{p} = 0.57$ 。何謂簡單隨機樣本 (SRS)？若調查結果聲稱：「.....本調查的誤差界限是正負 4 個百分點 (95% 信賴水準)」，請問支持競選連任比例的信賴區間為何？以上述的調查為例，若欲提高信賴水準至 99%，樣本數應增加多少。(20%)