

考 試 科 目	統計學	系 所 別	國際經營與貿易學系	考 試 時 間	2月18日(一) 第三節
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1. (20%) Police plan to enforce speed limits by using radar traps at 4 different locations within the city limits. The radar traps at each of the locations L_1 , L_2 , L_3 , and L_4 are operated 40%, 30%, 20%, and 30% of the time, and a person who is speeding on his way to work has probabilities of 0.2, 0.1, 0.5, and 0.2, respectively, of passing through these locations, respectively.

- (1) What is the probability that the person will receive a speeding ticket on his way to work? (10%)
 (2) If the person received a speeding ticket on his way to work, what is the probability that he passed through the radar trap located at L_2 ? (10%)

2. (15%) A recent survey shows that 30% of potential buyers will purchase an electric powered car.

- (1) What is probability that over 160 in a sample of 500 potential buyers indicated that they would buy such a product? (7%)
 (2) An automobile manufacturer further states that it will be willing to mass produce these cars if more than 35% of potential buyers indicate they will purchase a newly designed electric car. In a sample of 500 potential buyers, 160 indicated that they would buy such a product. Should the manufacturer produce the new electric powered car at 95% confidence? (8%)

3. (15%) A men's clothing retailer stocks a variety of men shirts. The data record the type of sales during the last three months, indicating shirt style and size, which are as shown in the following table:

Size	Style		
	Button-down	Polo	Small print
Small	18	27	36
Medium	65	82	28
Large	103	65	22

Verify whether there is a relationship between shirt style and size at the 0.05 significant level.

4. (20%) A bank wishes to compare two companies (AA and BB) about the methods they use to appraise the value of residential homes. The bank selected a sample of 10 residential properties and scheduled both firms for an appraisal. The results, reported in NT million, are as follows.

Home	1	2	3	4	5	6	7	8	9	10
AA	13.5	11.0	13.1	14.2	10.5	12.0	13.1	11.0	12.5	14.9
BB	12.8	10.5	11.9	14.0	9.8	12.3	12.7	11.5	12.2	14.5

- (1) Can we conclude there is a difference in the mean appraised values of the homes between these two companies using the 0.05 significant level? (10%)

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(2) Construct a 95% confidence interval for the mean difference of the appraised home values between these two companies. (10%)

5. (30%) The following regression output is the result of a multiple regression application, in which we are interested in explaining the variation in retail price of 36 personal computers based on three explanatory variables, CPU speed, RAM, hard drive capacity, and monitor included (1=Yes, 0 = No).

	Estimate	Standard Error
Constant	-62.75	771.67
CPU speed	0.22	2.62
RAM	4.52	2.99
Hard driver capacity	173.57	45.18
Monitor	19.00	237.84

$$R^2=0.6961$$

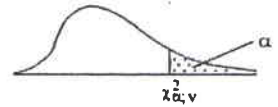
- (1) What is the variable, *Monitor*, called? What is the interpretation of the estimated coefficient for *Monitor* in the regression model? (5%)
- (2) Examine which variables could be omitted from the regression model. Test using a .05 level of significance. (12%)
- (3) Please fill in the values of (a)-(h) in the following analysis of variance table. (8%)

Source	df	SS	MS	F
Regression	(a)	(d)	(f)	(h)
Residual	(b)	(e)	(g)	
Total	(c)	49327249.56		

- (4) Compute the standard error for the regression model and interpret its meaning. (5%)

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Table of the Chi-square Distribution



$\alpha =$	0.995	0.99	0.98	0.975	0.95	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.05	0.025	0.01	0.005	0.001	$=\alpha$
$v = 1$	0.000393	0.000157	0.000628	0.000982	0.00393	0.0158	0.0642	0.1642	0.2706	0.3841	0.5024	0.5412	0.635	0.7879	1.0827	13.815	16.268	20.517	29.588	$v = 1$
2	0.0100	0.0201	0.0404	0.0506	0.103	0.211	0.446	0.708	1.065	1.386	1.676	1.920	2.179	2.446	2.703	3.007	3.579	4.605	5.024	2
3	0.0717	0.115	0.185	0.216	0.352	0.584	1.005	1.442	1.958	2.366	2.833	3.219	3.675	4.108	4.605	5.142	5.756	6.571	7.378	3
4	0.207	0.297	0.429	0.484	0.711	1.064	1.649	2.204	2.770	3.357	3.940	4.451	4.973	5.408	5.989	6.581	7.289	8.145	9.003	4
5	0.412	0.554	0.752	0.831	1.145	1.610	2.343	3.001	3.675	4.351	5.019	5.676	6.316	6.935	7.633	8.329	9.148	10.001	10.827	5
6	0.676	0.872	1.134	1.237	1.635	2.204	3.070	3.858	4.642	5.428	6.193	6.950	7.691	8.427	9.151	9.864	10.691	11.591	12.452	6
7	0.989	1.239	1.564	1.690	2.167	2.833	3.822	4.803	5.791	6.766	7.729	8.672	9.600	10.521	11.429	12.338	13.279	14.342	15.017	7
8	1.344	1.646	2.032	2.180	2.733	3.490	4.594	5.601	6.581	7.541	8.493	9.437	10.363	11.273	12.166	13.052	14.023	15.079	15.808	8
9	1.735	2.088	2.532	2.700	3.325	4.168	5.380	6.394	7.378	8.343	9.297	10.241	11.176	12.093	13.000	13.891	14.868	15.934	16.765	9
10	2.156	2.558	3.059	3.247	3.940	4.865	6.179	7.342	8.397	9.353	10.297	11.233	12.152	13.059	13.958	14.849	15.823	16.889	17.672	10
11	2.603	3.053	3.609	3.816	4.575	5.578	6.989	8.212	9.275	10.231	11.176	12.112	13.031	13.938	14.838	15.731	16.707	17.774	18.558	11
12	3.074	3.571	4.178	4.404	5.226	6.304	7.807	9.072	10.136	11.092	12.037	12.973	13.891	14.798	15.691	16.578	17.551	18.618	19.402	12
13	3.565	4.107	4.765	5.009	5.892	7.042	8.634	10.005	11.070	12.026	12.971	13.907	14.825	15.732	16.625	17.512	18.485	19.552	20.336	13
14	4.075	4.660	5.368	5.629	6.571	7.790	9.467	10.951	12.016	12.971	13.916	14.852	15.769	16.676	17.569	18.456	19.429	20.496	21.280	14
15	4.601	5.229	5.985	6.262	7.261	8.547	10.307	11.911	13.076	14.031	14.976	15.912	16.829	17.736	18.629	19.516	20.489	21.556	22.340	15
16	5.142	5.812	6.614	6.908	7.962	9.312	11.152	12.756	13.921	14.876	15.812	16.748	17.665	18.572	19.465	20.352	21.325	22.392	23.176	16
17	5.697	6.408	7.255	7.564	8.672	10.085	12.002	13.606	14.771	15.726	16.662	17.598	18.515	19.422	20.315	21.202	22.175	23.242	24.026	17
18	6.265	7.015	7.906	8.231	9.390	10.865	12.857	14.461	15.626	16.581	17.517	18.453	19.370	20.277	21.170	22.057	22.930	23.903	24.687	18
19	6.844	7.633	8.567	8.907	10.117	11.651	13.716	15.320	16.485	17.440	18.376	19.312	20.229	21.136	22.029	22.916	23.789	24.762	25.546	19
20	7.434	8.260	9.237	9.591	10.851	12.443	14.578	16.182	17.347	18.302	19.238	20.174	21.091	21.998	22.891	23.778	24.651	25.624	26.408	20
21	8.034	8.897	9.915	10.283	11.591	13.240	15.445	17.049	18.214	19.169	20.105	21.041	21.958	22.865	23.758	24.645	25.518	26.491	27.275	21
22	8.643	9.542	10.600	10.982	12.338	14.041	16.314	17.918	19.083	19.938	20.874	21.810	22.727	23.634	24.527	25.414	26.287	27.260	28.044	22
23	9.260	10.196	11.293	11.688	13.091	14.848	17.187	18.791	19.956	20.811	21.747	22.683	23.590	24.497	25.390	26.277	27.150	28.123	28.907	23
24	9.886	10.856	11.992	12.401	13.848	15.659	18.062	19.666	20.831	21.686	22.622	23.558	24.465	25.372	26.265	27.152	28.025	28.998	29.782	24
25	10.520	11.524	12.697	13.120	14.611	16.473	18.940	20.544	21.709	22.564	23.500	24.436	25.343	26.250	27.143	28.030	28.903	29.876	30.660	25
26	11.160	12.198	13.409	13.844	15.379	17.292	19.820	21.424	22.589	23.444	24.380	25.316	26.223	27.130	28.023	28.910	29.783	30.756	31.540	26
27	11.808	12.879	14.125	14.573	16.151	18.114	20.703	22.307	23.472	24.327	25.263	26.199	27.106	28.013	28.906	29.793	30.666	31.639	32.423	27
28	12.461	13.565	14.847	15.308	16.928	18.939	21.588	23.192	24.357	25.212	26.148	27.084	27.991	28.898	29.791	30.678	31.551	32.524	33.308	28
29	13.121	14.256	15.574	16.047	17.708	19.768	22.475	24.079	25.244	26.099	26.954	27.880	28.787	29.694	30.587	31.474	32.347	33.320	34.104	29
30	13.787	14.953	16.306	16.791	18.493	20.599	23.364	24.968	26.133	26.988	27.843	28.749	29.656	30.559	31.452	32.339	33.212	34.185	34.969	30
40	20.706	22.164	23.838	24.433	26.509	29.051	32.345	34.769	36.193	37.567	38.885	40.153	41.471	42.739	43.957	45.125	46.253	47.440	48.587	40
50	27.991	29.707	31.664	32.357	34.764	37.689	41.449	44.363	46.277	47.951	49.525	51.000	52.375	53.650	54.825	56.000	57.175	58.350	59.525	50
60	35.535	37.485	39.699	40.482	43.188	46.459	50.641	53.972	56.913	58.913	60.813	62.613	64.313	65.913	67.413	68.813	70.213	71.613	72.913	60
70	43.275	45.442	47.893	48.758	51.739	55.329	59.898	63.972	67.527	70.527	73.427	76.227	78.927	81.527	84.027	86.427	88.827	91.227	93.627	70
80	51.171	53.539	56.213	57.153	60.391	64.278	69.207	73.572	77.937	81.202	84.367	87.432	90.397	93.262	96.027	98.692	101.257	103.722	106.187	80
90	59.196	61.754	64.634	65.646	69.126	73.291	78.558	83.825	88.990	93.155	97.220	101.185	105.050	108.815	112.480	116.045	119.610	123.175	126.740	90
100	67.327	70.065	73.142	74.222	77.929	82.358	87.945	93.532	98.917	104.102	109.187	114.172	119.057	123.842	128.527	133.112	137.597	141.982	146.267	100

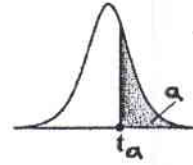
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- 二、試題請隨卷繳交。

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Percentage Points of the t Distribution; $t_{v, \alpha}$
 $P(T > t_{v, \alpha}) = \alpha$



v	α													
	0.40	0.30	0.20	0.15	0.10	0.05	0.025	0.02	0.015	0.01	0.0075	0.005	0.0025	0.0005
1	0.325	0.727	1.376	1.963	3.078	6.314	12.706	15.895	21.205	31.821	42.434	63.657	127.322	636.590
2	0.289	0.617	1.061	1.386	1.886	2.920	4.303	4.849	5.643	6.965	8.073	9.925	14.089	31.598
3	0.277	0.584	0.978	1.250	1.638	2.353	3.182	3.482	3.896	4.541	5.047	5.841	7.453	12.924
4	0.271	0.569	0.941	1.190	1.533	2.132	2.776	2.999	3.298	3.747	4.088	4.604	5.598	8.610
5	0.267	0.559	0.920	1.156	1.476	2.015	2.571	2.757	3.003	3.365	3.634	4.032	4.773	6.869
6	0.265	0.553	0.906	1.134	1.440	1.933	2.447	2.612	2.829	3.143	3.372	3.707	4.317	5.959
7	0.263	0.549	0.896	1.119	1.415	1.895	2.365	2.517	2.715	2.998	3.203	3.499	4.029	5.408
8	0.262	0.546	0.889	1.108	1.397	1.860	2.306	2.449	2.634	2.896	3.085	3.355	3.833	5.041
9	0.261	0.543	0.883	1.100	1.383	1.833	2.262	2.398	2.574	2.821	2.998	3.250	3.690	4.781
10	0.260	0.542	0.879	1.093	1.372	1.812	2.228	2.359	2.527	2.764	2.932	3.169	3.581	4.587
11	0.260	0.540	0.876	1.088	1.363	1.796	2.201	2.328	2.491	2.718	2.879	3.106	3.497	4.437
12	0.259	0.539	0.873	1.083	1.356	1.782	2.179	2.303	2.461	2.681	2.836	3.055	3.428	4.318
13	0.259	0.538	0.870	1.079	1.350	1.771	2.160	2.282	2.436	2.650	2.801	3.012	3.372	4.221
14	0.258	0.537	0.868	1.076	1.345	1.761	2.145	2.264	2.415	2.624	2.771	2.977	3.326	4.140
15	0.258	0.536	0.866	1.074	1.341	1.753	2.131	2.249	2.397	2.602	2.746	2.947	3.286	4.073
16	0.258	0.535	0.865	1.071	1.337	1.746	2.120	2.235	2.382	2.583	2.724	2.921	3.252	4.015
17	0.257	0.534	0.863	1.069	1.333	1.740	2.110	2.224	2.368	2.567	2.706	2.898	3.222	3.965
18	0.257	0.534	0.862	1.067	1.330	1.734	2.101	2.214	2.356	2.552	2.689	2.878	3.197	3.922
19	0.257	0.533	0.861	1.066	1.328	1.729	2.093	2.205	2.346	2.539	2.674	2.861	3.174	3.883
20	0.257	0.533	0.860	1.064	1.325	1.725	2.086	2.197	2.336	2.528	2.661	2.845	3.153	3.850
21	0.257	0.532	0.859	1.063	1.323	1.721	2.080	2.189	2.328	2.518	2.649	2.831	3.135	3.819
22	0.256	0.532	0.858	1.061	1.321	1.717	2.074	2.183	2.320	2.508	2.639	2.819	3.119	3.792
23	0.256	0.532	0.858	1.060	1.319	1.714	2.069	2.177	2.313	2.500	2.629	2.807	3.104	3.768
24	0.256	0.531	0.857	1.059	1.318	1.711	2.064	2.172	2.307	2.492	2.620	2.797	3.091	3.745
25	0.256	0.531	0.856	1.058	1.316	1.708	2.060	2.167	2.301	2.485	2.612	2.787	3.078	3.725
26	0.256	0.531	0.856	1.058	1.315	1.706	2.056	2.162	2.296	2.479	2.605	2.779	3.067	3.707
27	0.256	0.531	0.855	1.057	1.314	1.703	2.052	2.158	2.291	2.473	2.598	2.771	3.057	3.690
28	0.256	0.530	0.855	1.056	1.313	1.701	2.048	2.154	2.286	2.467	2.592	2.763	3.047	3.674
29	0.256	0.530	0.854	1.055	1.311	1.699	2.045	2.150	2.282	2.462	2.586	2.756	3.038	3.659
30	0.256	0.530	0.854	1.055	1.310	1.697	2.042	2.147	2.278	2.457	2.581	2.750	3.030	3.646
40	0.255	0.529	0.851	1.050	1.303	1.684	2.021	2.123	2.250	2.423	2.542	2.704	2.971	3.551
60	0.254	0.527	0.848	1.045	1.296	1.671	2.000	2.099	2.223	2.390	2.504	2.660	2.915	3.460
120	0.254	0.526	0.845	1.041	1.289	1.658	1.980	2.076	2.196	2.358	2.468	2.617	2.860	3.373
∞	0.253	0.524	0.842	1.036	1.282	1.645	1.960	2.054	2.170	2.326	2.432	2.576	2.807	3.291

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Table of the standard normal distribution

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9031	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9924	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9958	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986

備 註

- 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。