

考 試 科 目	統計學A 41211	系 所 別	金融系金融管理組	考 試 時 間	2月18日(元)第三節
---------	---------------	-------	----------	---------	-------------

1. (30%) An insurance agent likes to sell two types of policies to his clients, selling them both life insurance and auto insurance. The following joint distribution summarizes the properties of the number of life insurance policies sold to an individual (X) and the number of auto policies (Y).

		X	
		0	1 life policy
Y	0	0.10	0.25
	1 auto policy	0.25	0.40

- (1) Find the expected value and variance of the number of life insurance policies. (6%)
 - (2) Find the expected value and variance of the number of auto insurance policies. (6%)
 - (3) Find the correlation between X and Y . (10%)
 - (4) The agent earns TWD7,500 from selling a life insurance policy and TWD4000 from selling an auto policy. What is the expected value and standard deviation of the earnings of this agent from policies sold to a client? (8%)
2. (20%) A toll-free phone number is available from 9 A.M to 9 P.M. for your customers to register complaints about a product purchased from your company. Past history indicates that an average of 0.8 calls is received per minute.
- (1) What properties must be true about the situation described here in order to use the Poisson distribution to calculate probabilities concerning the number of phone calls received in a one-minute period? (6%)
 - (2) What is the probability that during a one-minute period two or more phone calls will be received? (6%)
 - (3) What is the maximum number of phone calls that will be received in a one-minute period 99.99% of the time? (8%)
3. (25%) The following table summarizes whether the stock market went up or down during each trading day of a particular year.

		Day of week				
		Monday	Tuesday	Wednesday	Thursday	Friday
Market	Down	42	49	46	43	41
Direction	Up	53	55	58	59	58

Use the significance level 0.05 to answer the following questions.

- (1) Test whether the proportion of earning positive return for each day, the overall rate of this particular year, is 0.5. (7%)

備 註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。

考 試 科 目	統計學 A	系 所 別	金融系 金融管理組	考 試 時 間	2 月 18 日(六) 第三節
---------	-------	-------	-----------	---------	-----------------

(2) Test whether the probabilities of earning positive return are equal when trading on Monday and Tuesday. (8%)

(3) Use a chi-squared test to determine if these data indicate that trading on some days is better or worse (more or less likely to earn positive returns) than any other. (10%)

4. (25%) The following table summarizes the playing time (in seconds) of a sample of 639 songs grouped by genre.

Genre	Blues	Country	Folk	Jazz	Latin	Rock
Mean	261.68	205.36	187.68	300.08	262.27	234.33
Standard deviation	84.57	68.23	67.68	122.69	83.37	103.30
Number of songs	19	96	63	192	22	247

(1) Test whether the population means of playing time for folk and country genres are equal with the significance level 0.05. (8%)

(2) Fit a multiple regression of rating on five dummy variables that represents the blues, country, folk, jazz, and Latin genres. The following table summarizes the estimated results. Fill in all the empty cells (a)-(l). (12%)

Term	Estimate	Standard error	t statistic
Intercept	(a)	6.448	(g)
Blues	(b)	24.127	(h)
Country	(c)	12.188	(i)
Folk	(d)	14.304	(j)
Jazz	(e)	9.750	(k)
Latin	(f)	22.548	(l)

(3) Compute the value of R^2 for the regression model in part (2). (5%)

備

註

- 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

考 試 科 目	統計學A	系 所 別	金融系金融管理組	考 試 時 間	2 月 18 日(六) 第三節
---------	------	-------	----------	---------	-----------------

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

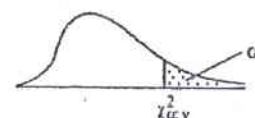
備

註

- 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。

考試科目	統計學 A	系所別	金融學金融管理組	考試時間	二月十八日(六)第三節
------	-------	-----	----------	------	-------------

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	0.02	0.01	0.005	0.001	$=\alpha$
$v = 1$	0.0000446	0.000157	0.000288	0.000484	0.000939	0.00158	0.00264	0.00429	0.00676	0.0106	0.0168	0.0259	0.0410	0.0638	0.102	0.155	0.234	0.384	0.502	0.854	$v = 1$
2	0.0100	0.0201	0.0400	0.0506	0.103	0.211	0.446	0.708	1.06	1.39	1.73	2.18	2.71	3.22	3.84	4.61	5.02	5.99	6.63	7.88	2
3	0.0717	0.115	0.185	0.216	0.352	0.584	1.005	1.42	1.94	2.37	2.85	3.34	3.92	4.41	5.02	5.58	6.25	6.93	7.78	8.53	3
4	0.207	0.297	0.429	0.484	0.711	1.064	1.649	2.20	2.76	3.20	3.68	4.10	4.61	5.01	5.62	6.09	6.75	7.38	8.03	8.76	4
5	0.412	0.554	0.752	0.831	1.145	1.610	2.343	2.98	3.58	4.00	4.50	4.95	5.41	5.80	6.41	6.88	7.53	8.15	8.75	9.49	5
6	0.676	0.872	1.134	1.237	1.635	2.204	3.070	3.70	4.30	4.70	5.20	5.63	6.08	6.46	7.08	7.55	8.20	8.81	9.39	10.15	6
7	0.989	1.239	1.564	1.690	2.167	2.833	3.822	4.46	5.05	5.45	5.95	6.38	6.83	7.21	7.84	8.31	8.96	9.57	10.14	10.92	7
8	1.344	1.646	2.032	2.180	2.733	3.490	4.594	5.23	5.82	6.22	6.72	7.15	7.60	7.98	8.61	9.08	9.73	10.34	10.91	11.70	8
9	1.735	2.088	2.532	2.700	3.325	4.168	5.380	6.02	6.61	7.01	7.51	7.94	8.39	8.77	9.40	9.87	10.52	11.13	11.70	12.50	9
10	2.156	2.558	3.059	3.247	3.940	4.865	6.179	6.82	7.41	7.81	8.31	8.74	9.19	9.57	10.20	10.67	11.32	11.93	12.50	13.34	10
11	2.603	3.053	3.609	3.816	4.575	5.578	6.989	7.63	8.22	8.62	9.12	9.55	10.00	10.38	11.01	11.48	12.13	12.74	13.31	14.16	11
12	3.074	3.571	4.178	4.404	5.226	6.304	7.807	8.45	9.04	9.44	9.94	10.37	10.82	11.20	11.83	12.30	12.95	13.56	14.13	15.00	12
13	3.565	4.107	4.765	5.009	5.892	7.042	8.634	9.28	9.87	10.27	10.77	11.20	11.65	12.03	12.66	13.13	13.78	14.39	14.96	15.84	13
14	4.075	4.660	5.368	5.629	6.571	7.790	9.467	10.12	10.71	11.11	11.61	12.04	12.49	12.87	13.50	13.97	14.62	15.23	15.80	16.69	14
15	4.601	5.229	5.985	6.262	7.261	8.547	10.307	10.97	11.56	11.96	12.46	12.89	13.34	13.72	14.35	14.82	15.47	16.08	16.65	17.54	15
16	5.142	5.812	6.614	6.908	7.962	9.312	11.152	11.83	12.42	12.82	13.32	13.75	14.20	14.58	15.21	15.68	16.33	16.94	17.51	18.41	16
17	5.697	6.408	7.255	7.564	8.672	10.085	12.002	12.69	13.28	13.68	14.18	14.61	15.06	15.44	16.07	16.54	17.19	17.80	18.37	19.28	17
18	6.265	7.015	7.906	8.231	9.390	10.865	12.857	13.55	14.14	14.54	15.04	15.47	15.92	16.30	16.93	17.40	18.05	18.66	19.23	20.15	18
19	6.844	7.633	8.567	8.907	10.117	11.651	13.716	14.42	15.01	15.41	15.91	16.34	16.79	17.17	17.80	18.27	18.92	19.53	20.10	21.03	19
20	7.434	8.260	9.237	9.591	10.851	12.443	14.578	15.29	15.88	16.28	16.78	17.21	17.66	18.04	18.67	19.14	19.79	20.40	20.97	21.91	20
21	8.034	8.897	9.915	10.283	11.591	13.240	15.445	16.17	16.76	17.16	17.66	18.09	18.54	18.92	19.55	20.02	20.67	21.28	21.85	22.80	21
22	8.643	9.542	10.600	10.982	12.338	14.041	16.314	17.05	17.64	18.04	18.54	18.97	19.42	19.80	20.43	20.90	21.55	22.16	22.73	23.68	22
23	9.260	10.196	11.293	11.688	13.091	14.848	17.187	17.93	18.52	18.92	19.42	19.85	20.30	20.68	21.31	21.78	22.43	23.04	23.61	24.57	23
24	9.886	10.856	11.992	12.401	13.848	15.659	18.062	18.81	19.40	19.80	20.30	20.73	21.18	21.56	22.19	22.66	23.31	23.92	24.49	25.46	24
25	10.520	11.524	12.697	13.120	14.611	16.473	18.940	19.69	20.28	20.68	21.18	21.61	22.06	22.44	23.07	23.54	24.19	24.80	25.37	26.35	25
26	11.160	12.198	13.409	13.844	15.379	17.292	19.820	20.58	21.17	21.57	22.07	22.50	22.95	23.33	23.96	24.43	25.08	25.69	26.26	27.25	26
27	11.808	12.879	14.125	14.573	16.151	18.114	20.703	21.47	22.06	22.46	22.96	23.39	23.84	24.22	24.85	25.32	25.97	26.58	27.15	28.15	27
28	12.461	13.565	14.847	15.308	16.928	18.939	21.588	22.36	22.95	23.35	23.85	24.28	24.73	25.11	25.74	26.21	26.86	27.47	28.04	29.05	28
29	13.121	14.256	15.574	16.047	17.708	19.768	22.475	23.25	23.84	24.24	24.74	25.17	25.62	26.00	26.63	27.10	27.75	28.36	28.93	29.95	29
30	13.787	14.953	16.306	16.791	18.493	20.599	23.364	24.15	24.74	25.14	25.64	26.07	26.52	26.90	27.53	28.00	28.65	29.26	29.83	30.86	30
40	20.706	22.164	23.838	24.433	26.509	29.051	32.345	33.19	33.78	34.18	34.68	35.12	35.57	35.95	36.58	37.05	37.70	38.31	38.88	40.00	40
50	27.991	29.707	31.664	32.357	34.764	37.689	41.449	42.29	42.88	43.28	43.78	44.22	44.67	45.05	45.68	46.15	46.80	47.41	47.98	49.13	50
60	35.535	37.485	39.699	40.482	43.188	46.459	50.641	51.50	52.09	52.49	52.99	53.43	53.88	54.26	54.89	55.36	56.01	56.62	57.19	58.36	60
70	43.275	45.442	47.893	48.758	51.739	55.329	59.898	60.77	61.36	61.76	62.26	62.70	63.15	63.53	64.16	64.63	65.28	65.89	66.46	67.65	70
80	51.171	53.539	56.213	57.153	60.391	64.278	69.207	70.09	70.68	71.08	71.58	72.02	72.47	72.85	73.48	73.95	74.60	75.21	75.78	77.00	80
90	59.196	61.754	64.634	65.646	69.126	73.291	78.558	79.45	79.94	80.34	80.84	81.28	81.73	82.11	82.74	83.21	83.86	84.47	85.04	86.28	90
100	67.327	70.065	73.142	74.222	77.929	82.358	87.945	88.84	89.33	89.73	90.23	90.67	91.12	91.50	92.13	92.60	93.25	93.86	94.43	95.69	100

備

註

- 一、作答於試題上者，不予計分。
二、試題請隨卷繳交。