

國立臺北大學九十一學年度碩士班招生考試試題

系(所)別:合作經濟學系甲、乙組
科目:統計學

共三頁
第一頁

可 不可使用計算機

1. Let A, B and C be three events $C \subset B \subset A$. Suppose $P(B) > 0$. Prove that $P(C|B) \geq P(C|A)$ (10%)
2. Multiple-choice questions.
 - I. Which of the following is not required for random sampling; (2%)
 - (A) Each population unit has an equal probability of being chosen.
 - (B) Units are chosen independently of one another.
 - (C) The sample must be perfectly representative of the population.
 - (D) Some source of randomness, such as a table of random digits, must be used.
 - II. The Use of the finite population correction factor will: (2%)
 - (A) Increase the standard error of the average.
 - (B) Decrease the standard error of the average.
 - (C) Not change the standard error of the average.
 - (D) Decrease the sample average.
 - III. To decrease the width of a confidence interval about a population mean, you can (3%)
 - (A) Increase the variability.
 - (B) Increase the size of the sample.
 - (C) Decrease the sample average.
 - (D) Increase the confidence level.
 - IV. The preferred "typical value" for income data is: (3%)
 - (A) The average.
 - (B) The median.
 - (C) The mode.
 - (D) There is no preferred typical value.
3. Two litters of rata have been born. Litter 1 has two brown haired and one gray haired. Litter 2 has three brow haired and two gray haired.
 - (1) A litter is selected at random and then a rat is selected at random from that litter. Given that a brown rat is selected, what is the probability it came from Litter 1? (6%)
 - (2) All the rats are put together and one is randomly selected. Give that a brown rat is selected, what is the probability it came from Litter 1? (6%)
4. Let (X, Y) be a bivariate random vector whose distribution is uniform on the triangle bounded by the lines $y=1$ and $x=y$. That is, the joint pdf of (X, Y) is
$$f(x, y) = \begin{cases} 2 & 0 < x < y < 1 \\ 0 & \text{otherwise} \end{cases}$$
 - (1) Find the marginal distribution of Y . What is the common name for this distribution? (5%)
 - (2) Find the conditional distribution of $X|Y$. What is the common name for this distribution? (5%)
 - (3) Compute $E(X)$. (5%)
 - (4) Are X and Y independent? Why? (3%)

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5. 下列人工資料是 10 家農會逾放比與虧損金額情況，

(X) 逾放比 (%)	54	69	74	43	29	48	32	50	21	30
(Y) 虧損金額 (千萬元)	62	69	83	38	41	26	31	28	24	38

$$\begin{aligned} \sum X &= 450 & \sum X^2 &= 23012 & \sum Y^2 &= 23060 \\ \sum Y &= 440 & \sum XY &= 22358 \end{aligned}$$

- (1) 利用最小平方法配置一條 Y 對 X 的迴歸直線: $Y = \beta_0 + \beta_1 X + \varepsilon$?
 並列出其假設條件? 10 分
- (2) 檢定 $H_0: \beta_1 = 0$ 對 $H_a: \beta_1 \neq 0$, 顯著水準 $\alpha = 0.05$? 5 分
- (3) 求算判定係數 R^2 ? 解釋其意義。 5 分
- (4) 就前面(2)與(3)小題的結果評估此迴歸模式配置的好壞? 5 分
- (5) 若有一農會, 其逾放比 40%, 根據(1)所估計的迴歸式, 預測可能的虧損金額? 就此問題信賴區間(confidence interval)與預測區間(prediction interval)那一個較適用於列出其上下界? 5 分

6. 假設財政部欲瞭解國內銀行經營狀況, 隨機抽取 200 家公(民)營銀行進行金檢, 得到下列資料

經營型態	金檢結果			合計
	良好	普通	不良	
公營	60	20	40	120
民營	40	30	10	80
合計	100	50	50	200

在顯著水準 $\alpha = 0.05$ 下檢定金檢結果與經營型態是否有關連? 10 分

7. The following data show the revenues before entering WTO and after entering WTO, in millions of dollars, for ten trade companies.

Company	1	2	3	4	5	6	7	8	9	10
Before entering WTO	5.4	6.9	7.4	4.3	2.9	4.8	3.2	5.0	2.1	3.0
After entering WTO	6.2	6.9	8.3	3.8	4.1	2.6	3.1	2.8	2.4	3.8

Which of the following tests can be approximately applied to these data to assess the statistical significance of the difference between the revenues before and after entering WTO. **Select all those that are applicable.**

- (a) Pooled t test (b) Wilcoxon's Two-Sample test (c) Wilcoxon's Signed rank test
 (d) Matched Pairs t test (e) Two-Sample t test (unpooled) (f) χ^2 test with one degree of freedom (g) Sign test
- 10 分

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統計表

標準常態分配表



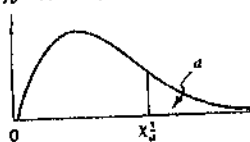
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3313	.3340	.3365	.3389
1.0	.3413	.3437	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3688	.3709	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4223	.4238	.4253	.4268	.4282	.4297	.4309	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4773	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4933	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4963	.4965	.4966
2.7	.4968	.4969	.4971	.4972	.4974	.4975	.4976	.4977	.4978	.4979
2.8	.4980	.4981	.4982	.4983	.4984	.4985	.4986	.4987	.4988	.4989
2.9	.4990	.4991	.4992	.4993	.4994	.4995	.4996	.4997	.4998	.4999
3.0	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999

t 分配表



d.f.	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$	d.f.
1	3.078	6.314	12.706	31.821	63.657	1
2	1.886	2.920	4.303	6.965	9.925	2
3	1.638	2.353	3.182	4.541	5.841	3
4	1.533	2.132	2.776	3.747	4.604	4
5	1.476	2.015	2.571	3.365	4.032	5
6	1.440	1.943	2.447	3.143	3.707	6
7	1.415	1.895	2.365	2.998	3.499	7
8	1.397	1.860	2.306	2.896	3.355	8
9	1.383	1.833	2.262	2.821	3.250	9
10	1.372	1.812	2.228	2.764	3.169	10
11	1.363	1.796	2.201	2.718	3.106	11
12	1.356	1.782	2.179	2.681	3.055	12
13	1.350	1.771	2.160	2.650	3.012	13
14	1.345	1.761	2.145	2.624	2.977	14
15	1.341	1.753	2.131	2.602	2.947	15

χ^2 分配表



$\chi^2_{.100}$	$\chi^2_{.050}$	$\chi^2_{.025}$	$\chi^2_{.010}$	$\chi^2_{.005}$	d.f.
2.70554	3.84146	5.02389	6.63490	7.87944	1
4.60517	5.99147	7.37776	9.21034	10.5966	2
6.25139	7.87817	9.34840	11.3449	12.8381	3
7.77944	9.48773	11.1433	13.2767	14.8602	4