

國立臺北科技大學

九十四學年度商業自動化與管理研究所入學考試

統計學試題

填准考證號碼

第一頁 共一頁

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注意事項：

1. 本試題共十題，每題十分，共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在答案卷之答案欄內，否則不予計分。

1. For each of the following distributions decide which average you would use to measure the central tendency, and explain your choice:
 - a. The salaries of all the professors at your college.
 - b. The times that it takes 10 cars to run a measured mile.
 - c. The current time as shown on 10 different clocks.
 - d. The grades of this examination take.
2. A sociologist, Andrew Grieveley, wants to determine the average number of children in the households of Apawlingburg. He goes to all the schools in the community and takes a random sample of schoolchildren. He asks each child how many children are in his or her household. He uses all of this data to estimate the average. Why will this be a biased sample for this study?
3. People are to be classified according to Age (under 21, 21-39, or 40 and up), Sex (male or female), and Religion (Christian, Jewish, Muslim, Buddhist, or other). Calculate how many categories there will be and write out the sample space of possible outcomes.
4. What's wrong here? "Since the probability of rolling a 7 with two dice is $1/6$, I will roll about two 7s in my next 12 rolls of two dice."

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- What is a Type I error? What does it have to do with “significance level”?
 - Why don't we conduct hypothesis tests using $\alpha = 0$?
 - We are testing to see if two populations have the same mean. We wish to use small samples and to be able to use a standard t-test. What two assumptions must be reasonable about the two populations?
 - Explain why a 100% confidence interval is useless.
 - A 95% confidence interval is desired for the percentage of persons who perform perfectly on a sample test. What size sample should be used if we want to be confident that our estimate is no more than 3% off the true value?
 - A random sample of students at NTUT was asked two questions (a) Do you own more rock or more rap recorded music? (b) Are you for or against Proposition F4? Do the results indicate that answers to these 2 questions are statistically independent? Use $\alpha = 0.05$

	F4	
Listen to	For	Against
More rock	20	60
More rap	30	90

Appendix A: Areas to the left of z under the Normal Curve

Z score	Proportion of area to the left of Z	Z score	Proportion of area to the left of Z	Z score	Proportion of area to the left of Z
-4	0.00003	-2.33	0.0099	-1.65	0.0495
-3	0.0013	-2	0.0228	-1	0.1587
-2.58	0.0049	-1.96	0.0250	0	0.5

Appendix B: Critical Values of X^2 for a One-Tail Test: $\alpha = 0.05$

Degree of freedom	One tail on the left	One tail on the right
1	0.0039	3.84
2	0.1026	5.99
3	0.352	7.81
4	0.711	9.49
5	1.15	11.07