

1. 在複迴歸方程式中，若要比較「自變數」對「應變數」的重要性，是否可以各迴歸係數的大小去判定？如果不行，應該如何比較？(15%)
2. 在複迴歸方程式中，有所謂的共線性 (multicollinearity) 存在，這是什麼？它的存在會引起怎樣的問題？有沒有簡便的方法可以先行檢測它的存在？(20%)
3. 分層隨機抽樣 (stratified random sampling) 與叢集隨機抽樣 (clustering random sampling) 相異之處為何？如果想對台北市市長選舉，進行抽樣調查，哪一個合適？(15%)
4. (20%) Independent random samples  $n_1 = 36$  and  $n_2 = 64$  were selected from populations 1 and 2, respectively. The population parameters and the sample means and variances are shown in the table.

	Population 1	Population 2
Sample size	36	64
Sample mean	108	112
Sample variance	16.4	29.2

- a. If your research objective is to show that  $\mu_1$  is larger than  $\mu_2$ , state the alternative and the null hypotheses that you would choose for a statistical test.
  - b. Is the test in part(a) a one- or two-tailed test?
  - c. Give the rejection region for  $\alpha=0.05$ .
  - d. Calculate the value of the test statistics.
  - e. Conduct the test and state your conclusion.
5. 我利用總共 11 個樣本進行一個有 3 種處理 (treatment) 的單因子變異數分析，辛辛苦苦的跑出一份 ANOVA 的報表，但是因為使用品質差的噴墨印機表機又逢下雨，報表上有些部份 (總共七處) 暈開了，請你幫忙將他們補上去。(14%)



## Analysis of Variance

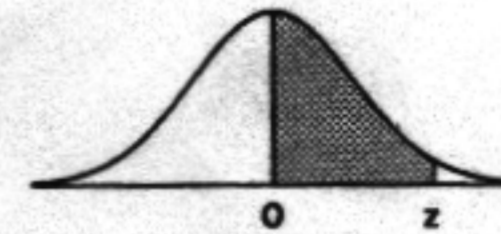
Source	DF	SS	MS	F
Factor	(1)	1500	(2)	(3)
Error	(4)	(5)	(6)	
Total	(7)	6000		

由上面的數據，在缺乏 F 表的情況下，你「認為」這三種處理真的有造成差別嗎 ( $\alpha=0.05$ ) ? (6%)

6. 請對下列問題描述，分別寫出其「虛擬假設」(null hypothesis)、與「對立假設」(alternate hypothesis)，不要去做計算及檢定：
- 商檢局規定水果罐頭不良品的比例不得超過 0.01，現在抽查 A 工廠的水果罐頭成品 150 個，發現不良品 2 個，在  $\alpha=0.05$  之下應如何處置。(5%)
  - 某一五金商人宣稱其供應汽車工廠之設備零件至少有 95% 符合規定，檢查 100 件發現 9 件劣品，以  $\alpha=0.01$  來驗證廠商誠實否。(5%)



**Table 3**  
**Normal curve areas**



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.00	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.10	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.20	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.30	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.40	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.50	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.60	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.70	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.80	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.90	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.00	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.10	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.20	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.30	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.40	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.50	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.60	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.70	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.80	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.90	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.00	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.10	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.20	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.30	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.40	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.50	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.60	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.70	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.80	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.90	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.00	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

z	area
3.50	.49976737
4.00	.49996833
4.50	.49999660
5.00	.49999971

Source: Computed by P. J. Hildebrand.