

- 3 某人欲瞭解A、B、C三種肥料的效果是否一樣，他對三種肥料所栽種的作物各隨機抽取5個試驗單位，並量其產量(假設為常態分布)，結果如下：

	樣本大小(n)	平均重量(\bar{x})	標準差(s)
A肥料	5	80.5	4.8
B肥料	5	76.4	4.2
C肥料	5	68.4	4.0

- (A) 假設三種肥料所栽種的作物的產量之族群變方相等 $\sigma_A^2 = \sigma_B^2 = \sigma_C^2$ ，請在顯著水準0.05之下，用F分布檢定 $H_0: \mu_A = \mu_B = \mu_C$ 。(10分)
- (B) 請用0.05的顯著水準以LSD方法來比較兩兩處理的平均差異。(5分)
- (C) 請比較LSD方法和Duncan MRT方法的型錯誤；並舉例說明它們的使用時機。(5分)

註： $F_{0.05,2,12} = 3.885$; $F_{0.05,3,12} = 3.490$; $F_{0.05,2,15} = 3.682$; $F_{0.05,3,15} = 3.287$

註： $t_{0.025,12} = 2.179$; $t_{0.05,12} = 1.782$; $t_{0.025,15} = 2.131$; $t_{0.05,15} = 1.753$

- 4 下列為玉米小區產量(蒲式耳,bushel)及其肥料用量(磅)的n=10組資料:

玉米產量(y_i)	12	13	13	14	15	15	14	16	17	18
肥料用量(x_i)	2	2	3	3	4	4	5	5	6	6

兩個變數的和、平方和、乘積和如下：

$$\sum x_i = 40, \sum y_i = 147, \sum x_i^2 = 180, \sum y_i^2 = 2193, \sum x_i y_i = 611$$

根據下列模式進行簡單直線迴歸分析：

$$y_i = \beta_0 + \beta x_i + \varepsilon_i \quad i = 1, \dots, 10$$

- (A) 請在0.05顯著水準下，檢定 $H_0: \beta = 0$ vs $H_1: \beta \neq 0$ 。(5分)
- (B) 令 ρ 表示玉米產量與肥料用量的族群簡單相關係數，請在0.05顯著水準下，檢定 $H_0: \rho = 0$ vs $H_1: \rho \neq 0$ 。(5分)
- (C) 請解釋 β 和 ρ 的單位及其數值大小的意義。(5分)

註： $t_{0.025,8} = 2.306$; $t_{0.025,9} = 2.262$; $t_{0.05,8} = 1.860$; $t_{0.05,9} = 1.833$

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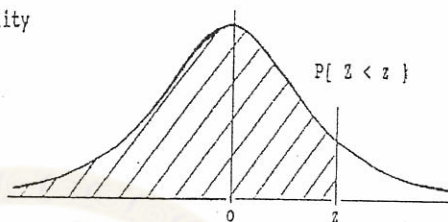
STANDARD STATISTICAL TABLES

1. Areas under the Normal Distribution

The table gives the cumulative probability up to the standardised normal value z

i.e.

$$P[Z < z] = \int_{-\infty}^z \frac{1}{\sqrt{2\pi}} \exp(-\frac{1}{2}z^2) dz$$



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	0.5159	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	0.7854
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	0.8804	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	0.9131	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	0.9773	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	0.9865	0.9868	0.9871	0.9874	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	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9965	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	0.9980	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
z	3.00	3.10	3.20	3.30	3.40	3.50	3.60	3.70	3.80	3.90
P	0.9986	0.9990	0.9993	0.9995	0.9997	0.9998	0.9998	0.9999	0.9999	1.0000

試題隨卷繳回