國立臺灣師範大學 104 學年度碩士班招生考試試題

科目：**統計學**　　　　　　　　　　　適用系所：管理研究所、全球經營與策略研究所

注意：1.本試題共 2 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則不予計分。

1. Indicate the (1)meaning (2)purpose/function (3)example of the following keywords and (4)make a comparison among them in terms of the examination of normalization of the data (25 points):

   (A) stem-and-leaf plot   (B) box plot   (C) P-P plot   (D) scatter plot

2. Indicate the (1)meaning (2)purpose/function (3)definition formula of the following keywords and (4)make a comparison among them in terms of the importance of standardization (25 points):

   (A) standard deviation   (B) standard score   (C) standard error   (D) standardized coefficient of regression

3. Eighty-one managers were randomly selected for a study to determine the effect of several factors on **Salary** (expressed in $000's). The factors selected were age (**Age**), seniority (**Sen**), years of formal education (**Edu**), and number of company divisions (**#Div**) they had been exposed to. A regression analysis was performed and the R^2 is 0.200 with $F(4,76)=4.74$, $p<.05$. The results of analysis are reported in Table 1 and 2.

   Table 1

Variables	Mean	Standard deviation	Age	Edu	Sen	#Div	Salary
Age	37.76	6.50	1.000				
Edu	17.24	1.62	0.130	1.000			
Sen	81.99	9.95	0.218	-0.007	1.000		
#Div	4.48	2.75	0.932	-0.018	0.056	1.000	
Salary($000's)	65.00	18.20	0.200	0.409	0.116	0.084	1.000

   Table 2

	Coefficient	Standard Error	t	p-value
Intercept	-47.75	28.26	-1.69	0.095
Age	1.09	1.01	1.08	0.285
Edu	3.97	1.29	3.07	0.003
Sen	0.10	0.22	0.45	0.652
#Div	-0.07	0.09	-0.78	0.440

   (1) If the median and mode of Salary are 61 and 55, discuss the skewness of Salary. (5 points)

   (2) What is the 95% confidence interval for the population mean of Salary? (5 points)

   (3) What are the variance, SS, and covariance of Age and Salary. (5 points)

   (4) Conduct a significance test of the correlation coefficient of Age and Salary. (5 points)

   (5) Draw a F-distribution to discuss the meaning of $F(4,76)=4.74$, $p<.05$. (5 points)

   (6) Test the hypothesis that the coefficients of the predictors are equal to 0 at the 0.05 level. Explain the conclusions of testing. (5 points)

   (7) Write out the multiple regression equation and compute the predicted Salary if age=50, edu=10, sen=10, and #Div=10. (5 points)

   (8) According to the coefficient of correlation of .932 listed in the table 1, what assumption may be violated and why? (5 points)

   (9) If the sample size increases to 1000, which part of the table 2 might be significantly decreased? Please explain why. (5 points)

(10) If we divide the sample into three age group (young, middle, old), the testing for mean differences of Salary among the three age groups reveals $F(2,78)=1.90$, $p=0.156$. Explain what kind of statistical analysis is used here and what is the conclusion. (5 points)

The critical value of the t-distribution

					α			
單尾	.1	.075	.05	.025	.01	.005	.001	.0005
雙尾	.2	.15	.10	.05	.02	.01	.002	.001
df								
1	3.078	4.165	6.314	12.706	31.821	63.657	318.309	636.619
2	1.886	2.282	2.920	4.303	6.965	9.925	22.327	31.599
3	1.638	1.924	2.353	3.182	4.541	5.841	10.215	12.924
4	1.533	1.778	2.132	2.776	3.747	4.604	7.173	8.610
5	1.476	1.699	2.015	2.571	3.365	4.032	5.893	6.869
6	1.440	1.650	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.617	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.592	1.860	2.306	2.896	3.355	4.501	5.041
9	1.383	1.574	1.833	2.262	2.821	3.250	4.297	4.781
10	1.372	1.559	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.548	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.538	1.782	2.179	2.681	3.055	3.930	4.318
13	1.350	1.530	1.771	2.160	2.650	3.012	3.852	4.221
14	1.345	1.523	1.761	2.145	2.624	2.977	3.787	4.140
15	1.341	1.517	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.512	1.746	2.120	2.583	2.921	3.686	4.015
17	1.333	1.508	1.740	2.110	2.567	2.898	3.646	3.965
18	1.330	1.504	1.734	2.101	2.552	2.878	3.610	3.922
19	1.328	1.500	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.497	1.725	2.086	2.528	2.845	3.552	3.850
21	1.323	1.494	1.721	2.080	2.518	2.831	3.527	3.819
22	1.321	1.492	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.489	1.714	2.069	2.500	2.807	3.485	3.768
24	1.318	1.487	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.485	1.708	2.060	2.485	2.787	3.450	3.725
26	1.315	1.483	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.482	1.703	2.052	2.473	2.771	3.421	3.690
28	1.313	1.480	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.479	1.699	2.045	2.462	2.756	3.396	3.659
30	1.310	1.477	1.697	2.042	2.457	2.750	3.385	3.646
35	1.306	1.475	1.670	2.030	2.438	2.724	3.365	3.591
40	1.303	1.473	1.684	2.021	2.423	2.704	3.348	3.551
50	1.299	1.471	1.676	2.009	2.403	2.678	3.333	3.496
60	1.296	1.469	1.671	2.000	2.390	2.660	3.319	3.460
70	1.294	1.468	1.667	1.994	2.381	2.648	3.307	3.435
80	1.292	1.465	1.664	1.990	2.374	2.639	3.281	3.416
90	1.291	1.462	1.662	1.987	2.368	2.632	3.261	3.402
100	1.290	1.460	1.660	1.984	2.364	2.626	3.245	3.390
120	1.289	1.458	1.658	1.980	2.358	2.617	3.232	3.373
150	1.287	1.456	1.655	1.976	2.351	2.609	3.211	3.357
200	1.286	1.453	1.653	1.972	2.345	2.601	3.195	3.340
∞	1.282	1.452	1.645	1.960	2.326	2.576	3.183	3.291