

1. The following table presents the distribution of “pressure scores” obtained from a sample of randomly selected women who have more than 2 children. (20 pt)
- (1) What is the statistical unit and the variable for these data?
 - (2) Calculate the range, mean, median, mode, and standard deviation for the distribution, or explain why they cannot be calculated.

Score	Frequency
20 and over	0
15-19	13
10-14	25
5-9	8
0-4	4

2. Below are the weights of 20 newborns from a hospital. Create a boxplot that displays the minimum, maximum, first quartile (Q1), median (Q2), third quartile (Q3), upper and lower whiskers, and indicate if there are any outliers. (20 pt)
- 3.1 3.2 3.2 3.3 3.4 3.4 3.5 3.5 3.6 3.6
 3.7 3.7 3.8 3.9 4.0 4.0 4.1 4.3 4.5 5.0

3. The following table was compiled from a sample of farms across the country.

Size of Farm	Net Farm Income		
	High	Medium	Low
	-- Number of farms --		
Small	0	2	58
Medium	6	4	20
Large	4	4	2

Test the statistical significance of the relationship between size of farm and net farm income. Use the 0.05 level to determine statistical significance. Specify the following items: (30 pt)

- (1) State the Null Hypothesis and the Alternative Hypothesis in words, not statistical symbols.
- (2) Report the formula you would use and show the necessary calculations.
- (3) Specify the degrees of freedom and the critical value (refer to Table 1).
- (4) Interpret the meaning of the statistical findings, and draw conclusions with estimates of the probability of having made Type I and Type II errors.

Table 1.
 Percentage points of the chi-square distribution



Right-Tail Probability (α)						
.10	.05	.025	.01	.005	.001	df
2.706	3.841	5.024	6.635	7.879	10.83	1
4.605	5.991	7.378	9.210	10.60	13.82	2
6.251	7.815	9.348	11.34	12.84	16.27	3
7.779	9.488	11.14	13.28	14.86	18.47	4
9.236	11.07	12.83	15.09	16.75	20.52	5
10.64	12.59	14.45	16.81	18.55	22.46	6
12.02	14.07	16.01	18.48	20.28	24.32	7
13.36	15.51	17.53	20.09	21.95	26.12	8
14.68	16.92	19.02	21.67	23.59	27.88	9
15.99	18.31	20.48	23.21	25.19	29.59	10

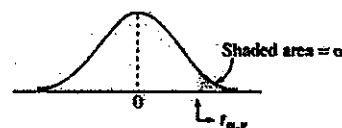
4. A study was conducted to determine whether there were differences in the length of time patients stay between rural and urban hospitals. The following data were compiled from 10 rural and 10 urban hospitals, randomly selected from all hospitals across the country.

Rural Hospitals	Urban Hospitals
-- Average Number of Days Patients Stay--	
4	4
6	2
5	2
4	3
4	6
9	7
6	7
9	4
8	2
5	3

Test the statistical significance of the difference between rural and urban hospitals in the length of time patients stay. Use the 0.05 level to determine statistical significance. Specify the following items: (30 pt)

- (1) State the Null Hypothesis and the Alternative Hypothesis in words, not statistical symbols.
- (2) Report the formula you would use and show the necessary calculations.
- (3) Specify the degrees of freedom and the critical value (refer to Table 2).
- (4) Interpret the meaning of the statistical findings, and draw conclusions with estimates of the probability of having made Type I and Type II errors.

Table 2.
Percentage points of Student's t distribution



df	Right-Tail Probability (α)								
	.40	.25	.10	.05	.025	.01	.005	.001	.0005
1	.325	1.000	3.078	6.314	12.706	31.821	63.657	318.309	636.619
2	.289	.816	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	.277	.765	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	.271	.741	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	.267	.727	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	.265	.718	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	.263	.711	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	.262	.706	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	.261	.703	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	.260	.700	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	.260	.697	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	.259	.695	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	.259	.694	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	.258	.692	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	.258	.691	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	.258	.690	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	.257	.689	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	.257	.688	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	.257	.688	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	.257	.687	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	.257	.686	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	.256	.686	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	.256	.685	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	.256	.685	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	.256	.684	1.316	1.708	2.060	2.485	2.787	3.450	3.725