

Assignment #1, Due 07/06/2026 & 07/07/2026

1. In class, we discussed the four types of data: nominal, ordinal, interval, and ratio. Based on information available from the College of Commerce at National Chengchi University, identify one example of each data type. Explain why each example is classified as that type, and discuss how misclassifying the data could result in inappropriate statistical analyses or misleading conclusions.
2. **Graduate Employment Statistics.** The following table contains employment information for 20 university majors.

Major	Employment Rate (%)	Average Starting Salary (US\$)	Average GPA
Accounting	95	52000	3.18
Business	91	50000	3.11
Computer Science	97	76000	3.39
Economics	92	61000	3.32
Electrical Engineering	96	79000	3.44
Finance	93	61000	3.24
Information Systems	94	64000	3.29
Management	90	49000	3.08
Marketing	89	48000	3.15
Mathematics	95	67000	3.47
Mechanical Engineering	95	74000	3.41
Physics	94	70000	3.53
Psychology	87	45000	3.26
Statistics	96	71000	3.49
Biology	88	47000	3.22
Chemistry	90	56000	3.31
Civil Engineering	93	69000	3.36
Political Science	86	46000	3.19
Sociology	85	44000	3.17
Communication	88	47000	3.14

- (a) Compute the mean, median, and standard deviation of starting salary.
- (b) Construct a histogram for employment rate and comment on the distribution.
- (c) Draw a boxplot for starting salary and identify any outliers.
- (d) Develop a scatter plot of GPA versus starting salary and discuss the relationship.
- (e) Compute the correlation coefficient between GPA and starting salary.

3. A company reports that 78% of its customers are satisfied. Suppose that a random sample of 80 customers is selected.
 - (a) Find the probability that exactly 60 customers are satisfied.
 - (b) Find the probability that at least 70 customers are satisfied.
 - (c) Compute the mean and standard deviation of the sampling distribution.
 - (d) Use the normal approximation to estimate the probability that between 58 and 68 customers are satisfied.

4. **Obesity.** Obesity is a risk factor for many health problems such as type 2 diabetes, high blood pressure, joint problems, and gallstones. Using data collected in 2018 through the National Health and Nutrition Examination Survey, the National Institute of Diabetes and Digestive and Kidney Diseases estimates that 37.7% of all adults in the United States have a body mass index (BMI) in excess of 30 and so are categorized as obese. The data in the file Obesity are consistent with these findings.
 - (a) Use the Obesity data set to develop a point estimate of the BMI for adults in the United States. Are adults in the United States obese on average?
 - (b) What is the sample standard deviation?
 - (c) Develop a 95% confidence interval for the BMI of adults in the United States.

5. **Annual Restaurant Expenditures.** The 92 million Americans of age 50 and over control 50 percent of all discretionary income. AARP estimates that the average annual expenditure on restaurants and carryout food was \$1873 for individuals in this age group. Suppose this estimate is based on a sample of 80 persons and that the sample standard deviation is \$550.
 - (a) At 95% confidence, what is the margin of error?
 - (b) What is the 95% confidence interval for the population mean amount spent on restaurants and carryout food?
 - (c) What is your estimate of the total amount spent by Americans of age 50 and over on restaurants and carryout food?
 - (d) If the amount spent on restaurants and carryout food is skewed to the right, would you expect the median amount spent to be greater or less than \$1873?