

Due: Monday, October 5, 2020

*Please place a header on your submission that includes your **name** and **ID number**. You must show your work for all questions to receive full credit.*

Questions

1. (10 points) For each of the following types of data, determine the type – either interval, ordinal, or nominal.
 - a. The price of latte at different coffee shops in Mall of the Emirates
 - b. The size of soft drinks purchased at Dominos Pizza
 - c. The color of each car sold by Al Futtaim Motors
 - d. The annual income (in US\$) of residents of the UAE
 - e. The number of students in the student center
 - f. Nationalities of all SBM students
 - g. Stage of cancer for the patients in the UAE hospitals (stage I, II, III, IV)
 - h. Number of people who have died from cancer in 2015
 - i. Blood type of all Dubai residents (A, B, AB, O)
 - j. Pulse rate of AUS soccer team after a workout
2. (10 points) The marks of 320 students on an economics midterm test were recorded in dataset Xr03-17 (inside folder ch03.xlsx under Data folder on iLearn). Describe this data in a frequency distribution, and relative frequency distribution table and use a histogram to summarize these data. Describe the modality and symmetry of the graph and interpret your findings by using the information on the histogram. (Please use 10 points increments and create a total of 8 classes on your histogram).
3. (10 points) Use dataset Xr03-50 (inside folder ch03.xlsx under Data folder on iLearn). In a business school where calculus is a prerequisite for the statistics course, a sample of 15 students was drawn. The marks for calculus and statistics were recorded for each student. By using the dataset,
 - a. Plot a scatter diagram for this data showing the relationship between the two variables. Show all relevant information on the graph (the graph should look professional).
 - b. What does the graph tell you about the relationship between the marks in calculus and statistics?
4. (10 points) Data from the last statistics course was collected on the number of hours each student studied and their grade on the final for three students. Calculate the sample variance, sample standard deviation and sample covariance (without the help of a computer software) for the following data and show your work

Number Hours Studied	20	15	27
Grade on Final	85	70	95

5. (10 points) Use dataset Xr02-42 (inside folder ch02.xlsx under Data folder on iLearn). The dean of a business school was looking for ways to improve the quality of the applicants to its MBA program. In particular, she wanted to know whether the undergraduate degree of applicants differed among her school and the three nearby universities with MBA programs. She sampled 100 applicants of her program and an equal number from each of the other universities. She recorded their undergraduate degrees (1 = BA, 2 = BEng, 3 = BBA, 4 = other) as well the university (codes 1, 2, 3, and 4). Use a tabular technique (cross-classification table and graph) to determine whether the undergraduate degree and the university each person applied to appear to be related.

6. (10 points) Suppose that you bought a stock 6 years ago at \$22. The stock's price at the end of each year is shown here.

Year	1	2	3	4	5	6
Price	18	26	28	42	58	48

- Compute the rate of return for each year.
 - Compute the **average** and median rate of return.
 - Compute the **compound** rate of return.
 - Which of the statistics computed in parts (b) and (c) best describe the return over the 6-year period? Show mathematically and explain.
7. (10 points) Use the excel file numbered **Xr04-104** for this example.

Among people older than 50, Internet use is still relatively low. A sample of 250 men and women older than 50 who had use the Internet at least once were selected. The number of hours on the Internet during the past month was recorded. In addition to Internet use, the numbers of years of education were recorded.

- Compute the coefficient of determination.
 - Determine the coefficients of the least squares line.
 - Describe what these statistics tell you about the relationship between Internet use and education.
8. (10 points) A business manager analyzed his company's most recent sales and determined the relationship between the way the customers saw/heard their advertisement and the gender of the customers. The joint probabilities in the following table were estimated.

	Radio	TV	Newspaper
Female	0.10	0.30	0.05
Male	0.05	0.25	0.25

- If the customer is a female, what is the probability that she saw the ad on TV?

- b. If the customer saw the ad in newspaper, what is the probability that the customer is a male?
 - c. What is the probability that the customer is a female?
 - d. What is the probability that the customer is a male and heard the ad on the radio?
 - e. Are being a female and seeing the ad in newspaper dependent?
9. (10 points) School of Business Administration and the women's dormitory at AUS decided to open a café/bakery in their new buildings. A brand name cafe has submitted bids on these two separate contracts. The company president believes that there is a 40% probability of winning the first contract. If they win the first contract, the probability of winning the second is 70%. However, if they lose the first contract, the president thinks that the probability of winning the second contract decreases to 50%.
- a. What is the probability that they win both contracts?
 - b. What is the probability that they lose both contracts?
 - c. What is the probability that they win only one contract?
10. (10 points) Three airlines serve between Istanbul and UAE in Dubai. Emirates has 50% of all the scheduled flights, Turkish Airlines has 30%, and Etihad has the remaining 20%. Their on-time rates are 70%, 55%, and 45%, respectively. A plane has just left on time. What is the probability that it was an Emirates plane?

Questions from 11 to 14 are for your own studies and they will not be graded. I will provide (post) the answers for these questions on the due date of the assignment on iLearn.

11. (0 points) According to a survey done among all survivors, number of people who were saved in a cruise ship accident was 1420 and this corresponded to 31.9 percent of all people on the cruise ship. There were three ticket classes on the ship; first-class, second-class and third class. The number of first-class passengers was 650, number of third-class passengers was 1412 and number of crew was 1816. Only 62 % of first-class, 41.5% of second-class and 25.2% of third-class passengers in addition to the 423 crew members survived in this accident.
- a. What is the population size in this example?
 - b. What is the sample size in this example?
 - c. What is the number of second-class passengers?
 - d. What is the sample modal class (among survivors of all three classes and the crew) in this example?
12. (0 points)
- a. Calculate the ***coefficient of variance*** of the marks secured by students in the exam as given: 33, 55, 76, 55, 97

- b. A company has two sections with 400 and 650 employees respectively. Their average weekly wages are \$800 and \$550. The standard deviations are 10 and 7.5 respectively. Which section has larger variability in wages?
13. (0 points) A smartphone was found to have two types of minor faults. The probability that a smartphone has a type 1 defect is 0.3 , and the probability that it has a type 2 defect is 0.4 . Also, the probability that it has both faults is 0.15 . Find the probabilities of the following events:
- A = An item has either a type 1 defect or a type 2 defect.
 - B = An item does not have either of the defects.
 - C = An item has defect 1, but not defect 2.
14. (0 points) We have the following two samples: $X = \{11, 9, 14, 8\}$ and $Y = \{18, 24, 15, 19\}$
- a. Calculate the sample variance for X and Y .
 - b. Calculate the sample covariance for X and Y .
 - c. Calculate the coefficient of correlation between X and Y .