BUS 210, Exam #1A, Fall 2018 Name _____
Section _____

Instructions: This exam is in two parts: Part I is to be completed partly at home using the materials posted on Blackboard for Part I and you will answer questions about that work in class below; Part II is to be completed entirely in class. You may not use cell phones, and you may only access internet resources you are specifically directed to use. You may access your data file for Part I of the exam in Blackboard. You may access the data files posted to Blackboard for the Exam part II. Be sure you are using the data file that matches the exam version you are given.

Part I: At Home
This part was completed at home. You can upload the Excel file for Part I to the Part I folder in Blackboard for use during the Exam period. However, this submission will not be graded in this location.

Part II: In Class

1. Use the work done at home to answer the Part I questions.
2. Open the file from the in-class portion of the final posted on Blackboard that corresponds to the version of the exam you have. This is Exam A.
3. Answer the questions corresponding to the data file, and any additional calculation in Excel required.
4. When you have finished answering questions on the exam, and all your answers have been recorded on the paper test for grading, upload both the take home Excel file and the in-class Excel file to the same in-class Exam folder in Blackboard for grading. Only those files submitted to the correct folder will be graded.
5. Turn in your paper copy of the exam to your instructor.
6. Enjoy your break!

Part I:

The following questions apply to problem #1 from Part I:

1. Report the mean and standard deviation of Experience. (6 points)

2. Report the median, IQR and upper and lower fences of Experience. (8 points)

3. Use this information to determine if there are any outliers in the data. If so, what are they? (5 points)

4. Describe the boxplot of experience. Does it appear to be skewed left, skewed right or approximately symmetric? Explain your reasoning. (4 points)

5. What does the x in the center of the box signify? (4 points)

6. Consider your histograms of Age. Describe the shape of the distribution. Possible descriptions include one or more of the following: skewed left, skewed right, symmetric, normal, monomodal, bimodal, multimodal, uniform, or none of these. Do the two graphs appear to tell the same story about the data or a different one? Explain your reasoning. (10 points)

7. Describe your scatterplot of Experience vs. Annual Salary. Does the data appear to have a trend? If so, is it positive or negative? (5 points)

The following question relates to problem #2 from Part I:

8. Describe your time series graph. Do you notice any trends in either Manufacturing or Retail over time? Do the two variables appear to be related to each other? Explain. (8 points)

The following questions relate to problem #3 from Part I:

9. Report the mean and median percentage on-time arrive for CLE. Label each one clearly. (4 points)

10. Based on your graphs, which airport has the better long-term on-time arrival percentage? Explain your reasoning based on the data. Can you think of a real-world reason as to why this might be so? (10 points)

11. Which graphs did you choose for this data and why? Were there some graphs types you rejected? (7 points)

Calculations in Excel: (1) 48 points, (2) 15 points, (3) 30 points

Part 2:

12. Order the seven steps of the modeling process in the appropriate order. List the sequence in the column to the right. (14 points)

Step	**Order**
Present the results to the organization.	_____
Develop a model.	_____
Implement model and update it over time.	_____
Define the problem.	_____
Verify the model.	_____
Collect and summarize data.	_____
Select one or more suitable decisions.	_____

13. Classify the following variables: (33 points)

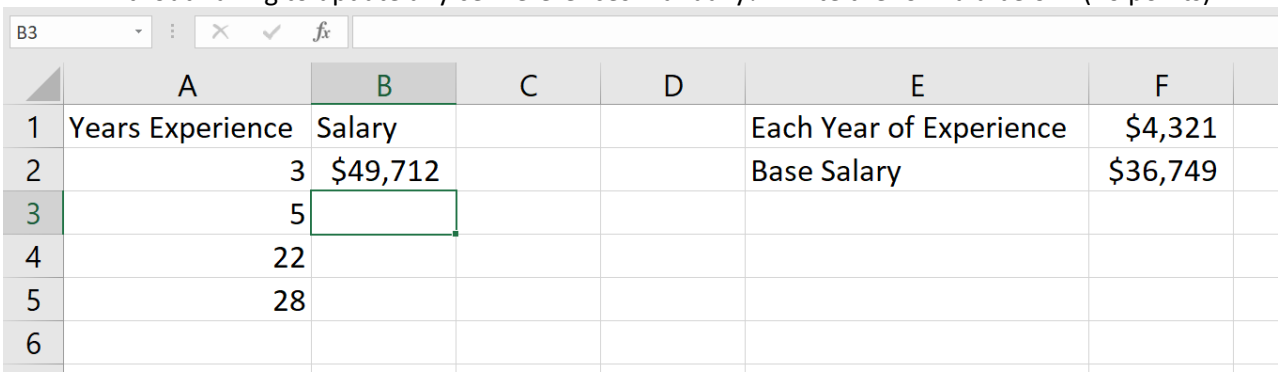
Variable	Categorical	Quantitative	Discrete	Continuous	Nominal	Ordinal	Interval	Ratio
Test Grade (Letter)								
Continent								
Month								
Volume (Sound)								
Cost ($)								
Vegetable								
Goal								
Altitude								
Growth Rate								
Sexual Orientation								
Year of Birth								

14. What does it mean if we say a value represents the 4^{th} percentile? (5 points)

15. With symmetric/bell-shaped distributions, approximately what percent of the observations are within three standard deviations of the mean? (5 points)

16. Expressed in percentiles, what does the first quartile represent? (5 points)

17. A screen capture of an Excel spreadsheet is shown below. A company bases their current salary for a particular job on a simple linear formula based on a base (entry-level salary) and the number of years of experience: i.e. $y = mx + b$ where y is salary, m is the increase, and b is the base salary. The annual increase for each year of experience and the base salary are provided on the screen. What would you need to type in Cell B3 to calculate the expected salary for the given number of years' experience, so that you can copy the formula into cells B4 and B5 without having to update any cell references manually? Write the formula below. (10 points)



18. In the data file for the exam, use the data set on the sheet #18 to answer the following questions using the Income data.
    a. Some of the data in the column is missing. How does Excel treat those blank cells? (5 points)

    b. Find and report the third quartile. (5 points)

    c. Find and report the minimum. (5 points)

d. Find and report the sample variance and the population variance. How do they differ? (7 points)

e. Find the 16th percentile. (5 points)

19. Create a blank sheet and label it #19. Enter the following values into Excel in a table, and use it to calculate the formula. Round your answer to 4 decimal places. (12 points)

X_1	X_2	Z	S	N
99	87	2.58	4.1	11

$$\frac{Z(X_1 - X_2)}{S/\sqrt{N-1}}$$

Upload your completed Excel files (**both of them!**) to the Exam #1 **to be graded** submission box in Blackboard and submit your completed paper exam to your instructor. You may not modify anything once the exam is submitted.