

Name: _____
BSAD 210—Montgomery College

EXAM 1

- There are 110 possible points on this exam. The test is out of 100.
- You have one class period to complete this exam, but you should be able to complete it in less than that
- Please turn off all cell phones and other electronic equipment.
- Be sure to read all instructions and questions carefully.
- Remember to show all your work. You may print your formulas in Excel using the Show Formulas option in the Formulas tab. Printed versions of your work showing formulas *and* showing the results counts as showing your work. But you must include both with your test for “showing your work” to count this way. Write your name on both print outs.
- Recall basic logic. “Water is wet” is a true statement. “Water is wet and leopards have stripes” is a false statement.
- *Please print clearly and neatly.*

Part I: Matching. Write the letter from the column on the right which best matches each word or phrase in the column on the left. You will not use all the options on the right and you cannot use the same option more than once.

2 points each.

- | | |
|---------------------------------|--|
| 1. ___ Coefficient of variation | A. Problem: will have error |
| 2. ___ Mean | B. Problem: when samples with unusual observations change |
| 3. ___ Median | C. Problem: additional calculation needed |
| 4. ___ Mode | D. Problem: impractical to get data for |
| 5. ___ Sample | E. Problem: when used to compare sample with very different averages |
| 6. ___ Standard deviation | F. Problem: samples with large outliers |
| 7. ___ Population | G. Problem: will have accuracy issues |
| | H. Problem: samples of continuous data |
| | I. Problem: samples with a low standard deviation |

Part II: Multiple Choice. Circle the letter that corresponds to the best answer.

4 points each.

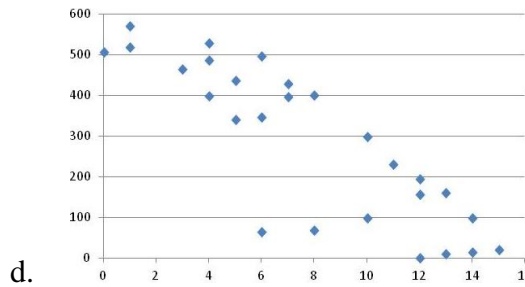
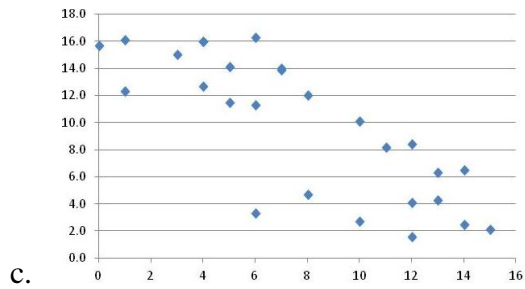
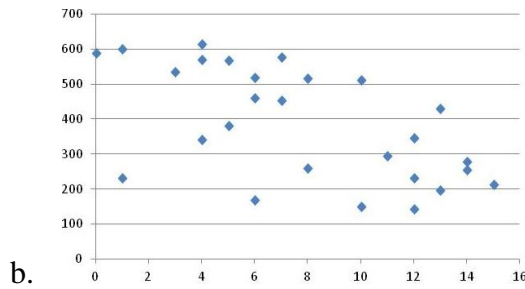
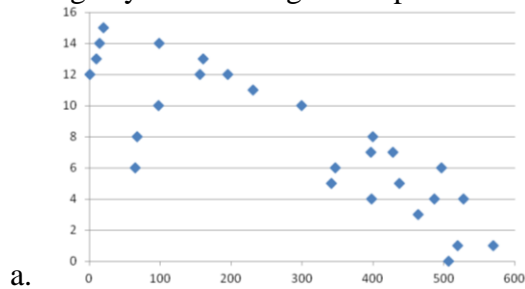
8. Consider this hypothetical sample data on how many exterior doors (in other words, all doors that lead outside) each house in the United States has. Based on this information available in the sample, what is the mean number of doors?

<i>Number of Exterior Doors</i>	<i>Percent of Doors in the U.S.</i>
1	10%
2	40%
3	25%
4	11%
5	3%
6	1%
Unknown	10%

- a. 2.00
 b. 2.30
 c. 2.56
 d. 3.50
 e. None of the above
9. Which of the following is an example of categorical data?
 a. A person's income at the age of 25.
 b. Which state a person was born in.
 c. If a person owns a car or not.
 d. B & C
 e. None of the above

10. Suppose you had some data concerning daily oil production (in gallons) for 500 different wells in the United States. If you wanted to get an idea for the distribution of production (including if there are multiple modes), which data display would be most appropriate?
- Dot plot
 - Histogram
 - Stem-and-leaf
 - Box plot
 - None of the above
11. Ira wants to learn how people view video game violence and decides to collect a sample. Which of the following methods would result in an accurate sample?
- While standing outside a major metro station on a weekend, offer people a chance to win a prize if they complete a short survey.
 - While standing outside a video game store on a weekend, ask people to take a detailed survey.
 - While standing outside a busy bus stop Monday morning and evening, request people take a short survey.
 - All of these will result in a very inaccurate sample.
 - It is impossible to get an accurate sample; there is always inaccuracy.
12. Which of the following is a weakness of presenting data in a pie chart?
- It is intuitively difficult to tell what the chart represents
 - People have trouble interpreting round objects
 - It's hard to tell which section is largest
 - A & C
 - None of the above
13. Use the Practice Exam 1 Dataset for this question. Which pair of variables is the most highly correlated?
- Number of competing stores in district & Annual profit, in thousands
 - Number of families in the sales area, in thousands & Annual profit, in thousands
 - Number of competing stores in district & Advertising spent, in thousands
 - Square feet, in thousands & Annual profit, in thousands
 - None of the above
14. Use the Practice Exam 1 Dataset for this question. What is the mean for amount (in thousands) that Happy Spud spent on advertising in the East region?
- 7.10
 - 8.20
 - 8.36
 - 9.36
 - None of the above

15. Use the Practice Exam 1 Dataset for this question. Create a scatterplot with Annual profit, in thousands and Number of competing stores in district with Number of competing stores in district on the horizontal axis. Which of the following is your resulting scatterplot?



e. None of the above

16. Which of the following pair of variables is positively correlated?

- a. Value of a car and the owner's income
- b. Time spent taking a shower and the number of forks that person owns
- c. Frequency of rain and how often people play outside
- d. A & C
- e. None of the above

17. The percent of families who own their own home is positively correlated with average income across different U.S. states. Suppose a governor attempts to increase average income by subsidizing homeownership. If this is a mistake, what is the most likely reason?
- Reverse causation: home ownership is the result of high incomes.
 - Reverse causation: something else is causing both variables.
 - Confounding variable: home ownership is the result of high incomes.
 - Confounding variable: something else is causing both variables.
 - None of the above / The governor has the correct interpretation
18. How does breast milk compare with feeding infants formula? Due to ethical constraints, studies addressing this question cannot randomly assign families one source of food or another. Instead, they compare outcomes (e.g. IQ) of children whose parents breast fed with those of children whose parents bottle fed. But parents who breast feed are very different from parents who bottle feed. What kind of sample bias is this?
- Self-selection
 - Survivorship
 - Undercoverage
 - B or C; it is impossible to tell with the information provided
 - It could be any; it is impossible to tell with the information provided
19. Suppose time spent playing video games and non-violent criminal activity are negatively correlated. While there might be a causation story (video games offer a safe outlet for criminal urges), a confounding variable could also be an explanation. Which of the following is the most likely reasonable confounding variable?
- Frequency of police patrols
 - Frequency of new video game releases
 - Weather
 - A & B
 - None of the above

Part III: Short Answer. *Answer the following.*

16 points each.

20. You've been put in charge of promotion and advertising for a new line of energy drinks, XTREME CAFFINE!, at the beverage company you work for. One of your first tasks is to create a website for XTREME CAFFINE!. The data below indicate the growth rate of unique visits each month after launch (the data are also available in the Practice Exam 1 Dataset):

<i>Month</i>	<i>Growth of Visits</i>	<i>Month</i>	<i>Growth of Visits</i>
May	48%	September	11%
June	30%	October	6%
July	25%	November	-2%
August	12%	December	4%

The website was launched in April, with 15,000 unique visitors. By the end of the year, how many unique visits are there? What is the average growth rate over this eight-month time span? (For the second question, round to the nearest two decimal places.)

Show your work; if you used Excel to answer this question, write what you put into Excel so I know how you got the answer you did.

21. Using the start-of-the-month 2014 stock prices below (the data are also available in the Practice Exam 1 Dataset), determine which stock has a more volatile price.¹ (When doing your calculations, round to the nearest cent.)

<i>Month</i>	<i>Microsoft</i>	<i>Apple</i>
January	\$35.99	\$555.68
February	\$37.74	\$502.61
March	\$37.92	\$523.42
April	\$41.15	\$537.76

Show your work; if you used Excel to answer this question, write what you put into Excel so I know how you got the answer you did.

¹ Data from Yahoo! Finance; Apple issued a 7:1 stock split in June 2014 which is why its stock price is much lower now.

22. As China grows wealthier, alcohol consumption is on the rise. (*Economist* “The Spirit Level”)² China’s alcohol consumption per person rose from 2.5 liters in 1978 to 6.7 liters in 2010. For the *Economist* article:

But the countrywide statistics hide a grimmer picture. More than half the Chinese population [does not drink alcohol at all]. Those who do drink often do so to great excess. Male Chinese drinkers down far more than Japanese ones, and almost as much as notoriously sozzled British, Australian or Irish boozers.

Based on the information provided, what is the median alcohol consumption per person in China? What’s advantageous about using the median here? What’s disadvantageous about using it?

² <http://www.economist.com/news/china/21611118-chinese-are-drinking-more-spirit-level>