Week 2

LATEST SUBMISSION GRADE

80%

1. Your company is developing a new product and about to launch it on the market. You would like to ask your company's employees for their thoughts on the product before it is sold to the public. You decide to ask your assistant to choose 10 phone numbers at random from the office phone directory and set up a brief interview with them. What, if any, are the issues here relating to randomness and representativeness? **1 / 1 point**

   - ○ The sample will not truly be random as you have asked your assistant, a person, to choose the phone numbers.
   - ◉ The sample will not be representative, as you can only end up interviewing employees with an office.
   - ○ The sample will neither be random nor representative, as 10 interviews is too small a number.
   - ○ There are no issues with randomness or representativeness.

   ✓ **Correct**
   Correct. Randomness/Representativeness and sample size are two completely separate issues. Review video: Basic statistics

2. You have just filled in a survey from a 24-hour gym, asking questions relating to your frequency of exercise, diet, and other general health topics. Which of the following is true? **1 / 1 point**

   - ○ You are part of the sample.
   - ○ You are part of the population.
   - ○ Neither a) nor b).
   - ◉ Both a) and b).

   ✓ **Correct**
   Correct, if you were chosen to give feedback, then you are in both the sample and the population.Review video: Basic statistics

3. You are the manager of a large sales team, and a company analyst has given you the summary statistics of sales over the past year for the purposes of calculating bonuses for your team. In particular, the lower and upper quartiles were $135,000 and $265,000 respectively. You are in the process of calculating the bonuses for the year when the analyst rushes into your office out of breath. It seems there was an error: the top performing **0 / 1 point**

salesperson was recorded as making $500,000 in sales, when in actual fact they made $600,000 in sales. How will this new information affect the lower and upper quartiles?

- There will be no effect on the upper and lower quartiles.
- Both the upper and lower quartiles have to be recalculated since the data is now more dispersed.
- Only the upper quartile has to be recalculated, since the error only involved the top performing salesperson.
- The lower quartile will have to be recalculated to compensate for the larger maximum sales amount.

Incorrect

Incorrect. The quartiles are robust against individual outliers.Review video: Measures of dispersion

4. The median salary for employees in a particular company is $75,000. However, one particular employee has recently received a $5,000 pay rise. Assume that all the other employees are still earning the same salary as before. What can we say about the new median income for these employees? **1 / 1 point**

- The median salary will not change at all.
- We need more information before we can say for certain.
- The median salary will go up by exactly $5,000.
- The median salary will go up by exactly $2,500.

Correct

Correct. Review video: Measures of central tendency

5. For a discrete variable, which of the following is NOT true? **1 / 1 point**

- The mode will always be an observable value of the variable.
- The median will always be an observable value of the variable.
- The mean may not be an observable value of the variable.
- The standard deviation may not be an observable value of the variable.

Correct

This is false. If there are an even number of observations, the sample median would be the average of the two middle observations. Review video: Measures of central tendency

6. Which of the following is NOT true? **0 / 1 point**

- It would be inappropriate to calculate the mean of ordinal variables.
- The variance for a sample is always larger than the standard deviation.
- A single large outlier has little to no effect on the upper and lower quartiles.
- If a sample has large positive outliers, then we expect the mean to be greater than the median.

Incorrect

This is true. The quartiles are robust to outliers. Review video: Measures of dispersion

7. For the first practice task involving the MQG share prices, we looked at the mean, the median, and the mode closing share price for each month. We made a comment at the end about possibly using the trading volumes as well in the calculations, so let's consider a simple case of that idea. Suppose there were exactly 3 trades of XYZ shares today. The first trade was for 2000 shares, trading at $3.50 per share. The second trade was for 500 shares, trading at $3.00 per share. The final trade was for 3000 shares, trading at $3.75 per share. There were no further trades for this share. What was the mean and median trading price per share over this trading day? **1 / 1 point**

- The mean was $3.50, the median was $3.00.
- The mean and median were both $3.50.
- The mean was $3.59, the median was $3.75.
- The mean was $3.42, the median was $3.50.

Correct

Correct.

8. The daily turnover for a particular company over the last 5 days, in thousands of dollars, was 23, 42, 37, 25, and 36. What is the mean and the standard deviation for the past 5 days? Choose the closest answer. (Hint: the past 5 days are the population). **1 / 1 point**

- The mean turnover is 32.6 thousand dollars, the standard deviation is 7.34 thousand dollars.
- The mean turnover is 32.6 thousand dollars, the standard deviation is 8.2 thousand dollars.
- The mean turnover is 36 thousand dollars, the standard deviation is 53.84 thousand dollars.

- The mean turnover is 36 thousand dollars, the standard deviation is 7 thousand dollars.

Correct
Correct. you are applying the POPULATION standard deviation formula.

9. A large transnational corporation conducts business on 6 different continents. The annual turnover for each of the 6 continents, in millions of dollars and arranged in alphabetical order of continent name, are 22, 64, 25, 13, 18, and 42. What is the median and range of these values? The values below are all expressed in millions of dollars. **1 / 1 point**

- (•) The median is 23.5, the range is 51.
- The median is 25, the range is 29.
- The median is 19, the range is 20.
- The mean is 30.67, The range is 46.

Correct
Correct.

10. You are part of a product design team, and you have surveyed members of the public about their colour preferences to help guide your team. Your colleague has suggested that if you were to assign numbers to the colours (e.g. Blue=0, Red=1, Orange=2), then you could do a more extensive analysis by (for example) taking the mean and median of these numeric values. What is the most correct response to this assertion? **1 / 1 point**

- We should make sure that the numbers are assigned in a way that matches the alphabetical order of the colours so that we are consistent in terms of the ordinal structure of the variables.
- We should not calculate measures of central tendency from these numbers since colours don't have a "location", but we can use these numbers to calculate the standard deviation (say) to figure out how varied the responses are.
- (•) Even though you have assigned numbers to the responses from the public, you are still dealing with nominal variables, so the described analysis is still inappropriate.
- Since you are talking about colours, you should really use the RGB colour system to assign numbers to colours, then do an analysis from there.

Correct
Correct.