Epi 3 Check on Learning (COL) Quiz

COL quizzes are *NOT* intended to be extremely challenging. Rather, the goal of COL quizzes are to simply assess students’ basic comprehension of the assigned materials and provide them with feedback early and without high stakes.

**Quiz Instructions:** Please complete this check on learning quiz after reviewing all of the required readings for this module. You may take this quiz as many times as you like.

# 

# Question ideas:

* Placeholder

# 

# Q1. Why descriptive analysis

[Multiple Answers]

Which of the following are reasons why we typically start our study with a descriptive analysis of our data?

|  |  |
| --- | --- |
|  | Descriptive analyses allow us to fully characterize the relationships between variables of interest. |
| ✅ | We can use descriptive analysis to uncover errors in our data. |
| ✅ | It helps us understand the distribution of values in our variables. |
| ✅ | Descriptive analysis serves as a starting point for understanding relationships between our variables. |

We typically start with descriptive analysis because: (1) We can use descriptive analysis to uncover errors in our data; (2) It helps us understand the distribution of values in our variables; (3) Descriptive analysis serves as a starting point for understanding relationships between our variables. Although descriptive analyses are a good starting point for understanding relationships between our variables, they are typically not sufficient to fully characterize the relationship between variables of interest.

# Q2. Characteristics of mean

[Multiple Choice]

Which of the following is a characteristic of the mean that makes it a favorable measure of central tendency?

|  |  |
| --- | --- |
| ✅ | It is a relatively intuitive measure for most people to understand. |
|  | For any set of values there can be multiple means. |
|  | The mean is relatively resistant to extreme values. |
|  | The mean value is not necessarily a value that is actually observed in the data. |

For any set of values, there can be only one mean value, the mean is a relatively intuitive measure for most people to interpret.

The mean is susceptible to extreme values.

Relative to the median and the mode, the mean is not very resistant to extreme values in the data.

Additionally, while it's true that the mean value is not necessarily observed in the data, that is not typically considered a favorable characteristic.

# Q3. Frequency functions

[Multiple Answers]

Which of the following functions did your required readings discuss using to find the frequency with which each category of a categorical variable appears in your data?

|  |  |
| --- | --- |
| ✅ | table() |
|  | freq() |
| ✅ | freq\_table() |
| ✅ | CrossTable() |

The table() function is part of base R and we can use it to find the frequency with which each category of a categorical variable appears in our data.

Your readings did not discuss the freq() function. As far as I know, there is no freq() function.

The freq\_table() function is part of the freqtables package and we can use it to find the frequency with which each category of a categorical variable appears in our data.

The CrossTable() function is part of the gmodels package and we can use it to find the frequency with which each category of a categorical variable appears in our data.

# Q4. Mode

[Multiple Answers]

Which of the following measures cannot be calculated using a base R function?

|  |  |
| --- | --- |
|  | Variance |
|  | Mean |
|  | Median |
| ✅ | Mode |

We can calculate the variance using base R's var() function.

We can calculate the mean using base R's mean() function.

We can calculate the median using base R's median() function.

There is no base R function for calculating the mode value of a vector.

# Q5. ggplot2

[Multiple Choice]

What is the name of the package we will use to create charts and graphs in this course?

|  |  |
| --- | --- |
|  | ploty |
| ✅ | ggplot2 |
|  | grid\_graphics |
|  | lattice |

We will primarily use the ggplot2 package to create charts and graphs in this course. The ggplot2 package is widely regarded as one of the best pieces of software for visualizing data available today. And it's free!!

**Q6. Incidence**

[Fill In The Blank]

\_\_\_\_\_\_\_ is defined as the proportion of newly developed cases of a disease over a specific time period.

Incidence is defined as the proportion of newly developed cases of a disease over a specific time period. (Szklo and Nieto, 2019, pg. 51)

**Q7. Prevalence**

[Matching]

Please match each term with its correct definition.

|  |  |
| --- | --- |
| Point prevalence | Cases at a given point in time |
| Period prevalence | Cases during a given period |
| Cumulative (lifetime) prevalence | Cases at any time in the past (up to the present time) |

(Szklo and Nieto, 2019, pg. 52 Table)

**Q8. The Book of Why – Causal Inference**

[Multiple Choice]

In the introduction to The Book of Why, Dr. Pearl gives the name of the science that is the topic of the book. Which one of the following names does he give?

|  |  |
| --- | --- |
|  | Epidemiology |
| ✅ | Causal Inference |
|  | Computer science |
|  | Artificial intelligence |

“The new science does not have a fancy name: I call it simply, ‘causal inference,’ as do many of my colleagues.” (Pearl and Mackenzie, 2018, pg. 1)

**Q9. The Book of Why – The human brain**

[Multiple Choice]

The introduction to The Book of Why “posits that \_\_\_\_\_ is the most advanced tool ever devised for managing causes and effects.”

|  |  |
| --- | --- |
| ✅ | The human brain |
|  | Artificial intelligence |
|  | Causal diagrams |
|  | The do calculus |

“It [causal inference] posits that the human brain is the most advanced tool ever devised for managing causes and effects.” (Pearl and Mackenzie, 2018, pg. 2)

**Q10. The Book of Why – Dumb data**

[True/False]

Data do not understand causes and effects.

|  |  |
| --- | --- |
| ✅ | True |
|  | False |

“If I could sum up the message of this book in one pithy phrase, it would be that you are smarter than your data. Data do not understand causes and effects. Humans do.” (Pearl and Mackenzie, 2018, pg. 21)