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Statistics Equations & Answers (Quickstudy: Academic)

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Statistics **EQUATIONS & ANSWERS™**

Essential Tools for Understanding Statistics & Probability – Rules, Concepts, Variables, Equations, **Helpful Hints** & **Common Pitfalls**

DESCRIPTIVE STATISTICS

Methods used to simply describe data set that has been observed

KEY TERMS & SYMBOLS

descriptive data: variables that represent some measure taken in a given measurement

categorical (qualitative) data: data variables with values that reflect some quality of the element, one of several categories, not a numeric measurement

population: "the whole", the entire group of which we wish to speak or that we intend to measure

sample: "the part", a representative subset of the population

simple random sampling: the most commonly assumed method for selecting a sample; samples are chosen so that every possible sample of the same size is equally likely to be the one that is selected

N: size of a population

n: size of a sample

x: the value of an observation

f: the frequency of an observation (i.e., the number of times it occurs)

frequency table: a table that lists the values observed in a data set along with the frequency with which it occurs

(population) parameter: some numeric measurement that describes a population, generally not known, but estimated from sample statistics

Ex: population mean μ ; population standard deviation σ ; population proportion p (sometimes denoted π)

(sample) statistic: some numeric measurement used to describe data in a sample, used to estimate or infer inferences about population parameters

Ex: sample mean \bar{x} ; sample standard deviation s ; sample proportion \hat{p}

Formulating Hypotheses

| Type | Statistic | Formula | Important Properties |
|---|--|--|---|
| measures of center (measures of central tendency) indicate which value is typical for the data set | mean | from raw data: $\bar{x} = \frac{\sum x_i}{n}$ from a frequency table: $\bar{x} = \frac{\sum xf_i}{n}$ | sensitive to extreme values, any outlier will influence the mean; more useful for symmetric data |
| | median the middle value in order of rank | $m = \text{odd: median has rank } \frac{n+1}{2}$ $m = \text{even: average of values with ranks } \frac{n}{2} \text{ and } \frac{n}{2} + 1$ | not sensitive to extreme values; more useful when data are skewed |
| | mode | the observation with the highest frequency | only measure of center appropriate for categorical data |
| measures of variation (measures of dispersion) reflect the variability of the data (i.e., how different the values are from each other) | mid-range | $\text{midrange} = \frac{\text{maximum} + \text{minimum}}{2}$ | not often used; highly sensitive to unusual values; easy to compute |
| | sample variance | $s^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$ | not often used; units are the squares of those for the data |
| | sample standard deviation | $s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$ | square root of variance; sensitive to extreme values; commonly used |
| | interquartile range (IQR) range | $\text{IQR} = Q_3 - Q_1$ (one quartile, below) $\text{range} = \text{maximum} - \text{minimum}$ | less sensitive to extreme values |
| measures of relative standing (measures of relative position) indicate how a particular value compares to the others in the same data set | percentile | data divided into 100 equal parts by rank (i.e., the 10 th percentile is that value greater than 10% of the others) | important to apply to normal distributions; use probability distributions |
| | quartile | data divided into 4 equal parts by rank: Q3 (third quartile) is the value greater than 25% of the others; Q1 (first quartile) is greater than 25%; Q2 is identical to the median | used to compute IQR (less IQR, above); Q3 is often viewed as the "median" of the upper half; Q1 as the "median" of the lower half; Q2 is the median of the data set |
| | Z score | $Z = \frac{x - \bar{x}}{s}$ To find the z value of any measurement, x , when the z score is Z : $Z = \frac{x - \bar{x}}{s}$ | measures the distance from the mean in terms of standard deviation |



Synopsis

Statistics problems can make the best students shudder as they near the classroom, but they need not worry any longer. QuickStudy is here to help! A comprehensive, up-to-date collection of tips and tricks for understanding statistics/probability is contained in this 3-panel (6-page) guide, which is designed with easy-to-use icons to help students go right to the equations and problems they most need to learn, and also call out helpful tips to use and common pitfalls to avoid.

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Customer Reviews

I like these laminated quick memory jogger sheets. paired with a good reference for the topic they are a great help. This is an almost perfect formula cheat sheet. It has the equations, a quick explanation and even some quick notes (warnings?) for usage/application. I truly love this sheet. pair this sheet with a good Statistics text for a great reference combo. A great study helper for a Intro stats course test. Go section by section through the sheet and read the section title and look away and write down the formula on a different sheet, explain to yourself why the formula is that way component by component and then return to the sheet to see if your answer matches the sheets. Make notes on what you didn't get correct and review that section of the sheet or your course text...sometimes google can find a different source that explains the concept in a manner that makes sense to you so don't forget to use google when studying. Many times a topic is introduced to us and we are confused by the topic and the presentation of it doesn't help our understanding. I find googling the topic and finding alternate sources for information allows me to have the topic presented

in a different manner that does make sense to MY brain and then returning to the original explanation it now all makes sense.

Was hoping for a quick reference chart-- this is not. Hard to read and nothing "quick" about it.

I got this for my wife because she was just begining statistics. I tried to read it off the pictures, but didn't have much luck. When it arrived I was surprised with how advanced it was and how the information beginners could use was spread throughout. It probably works well for people that have a firm foundation, but I wouldn't reccomend it for a beginner.

Nice laminated guide for easy reference. Serves the purpose of providing a handy quick "tip and technique" sheet. Reduces amount of time you would need to do Google searches and researching information in print material appendixes and glossaries.

as described

Useful

Nice ref

My son-in- law taking statistics says they are great and helped him alot.

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