To boldly go where no one has gone before....

Descriptive & Inferential Statistics

Introduction

In the 1960s Geography became a more academic and scientific subject and adopted more scientific approaches to research. This meant using statistical techniques to test hypotheses and theories quantitatively.
Statistics allow Geographers to ascertain patterns, discover relationships and examine cause-effect links.

There are many types of statistics but the most basic are Descriptive Statistics that summarise data and the more advanced type are Inferential Statistics that look at the relationships between sets of data.

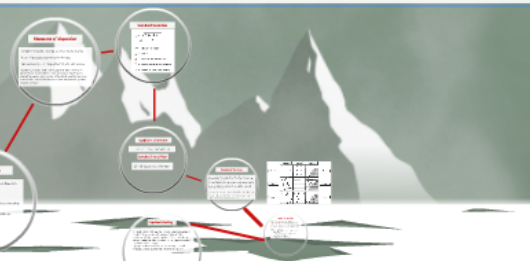
Descriptive Statistics

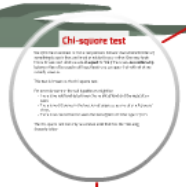
1. Types of Data: Nominal, Ordinal, Ratio and Interval
2. Measures of central tendency: mean, mode, and median
3. Measures of Dispersion: range, IQ range, standard deviation, variance, coefficient of variation and standard error of the mean.

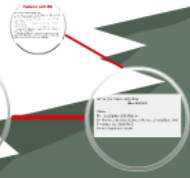
Data Sets

4 Different types of data set:

1. Nominal - refers to data that has names e.g. land use can be commercial, residential, agricultural, industrial or each types can be environmental, sustainable, e.g. agricultural.
2. Ordinal - refers to data that can be placed in ascending or descending order, e.g. city, town, village, hamlet, farm.
3. Interval - refers to real numbers, With this type there is no real zero e.g. in ten geometry - F3, 22.
4. Ratio - refers to real numbers that likely do possess a true zero point, e.g. population how no one will be a real lower negative number.







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Data Sets

Chi-square test

Chi-square Cont...

Nearest Neighbour

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2. Ordinal - refers to data that can be placed in ascending or descending order e.g. city, town, village, hamlet, farm.
3. Interval - refers to real numbers. With this type there is no real zero e.g. in temperature -7 & 32
4. Ratio - refers to real numbers but they do possess a true zero point, e.g. possible to have no rainfall but not have negative rainfall.

Central Tendency

This is the basic way of summarising data. There are three main mesaurements for central tendency:
Mean, Mode and Median.

1. Mean = the average

2. Median = middle value when the values are placed in ascending or descending order.

3. Mode = the value that occurs most often in the data set.

Measures of Dispersion

Useful for showing how much figures differ from the average.

Range - Difference between max and min values

Inter-quartile range - the range of the middle half of the values

Standard Deviation - takes into account all values and is not affected by extreme values. It measures dispersion of figures around the mean. Large number in the deviation values are wide spread and a small number means values are grouped together around the mean.

Standard Deviation

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

σ = standard deviation

$\sum$ = sum of

x = each value in the data set

$\bar{x}$ = mean of all values in the data set

n = number of value in the data set