Statistics

A **statistic** is a number used to communicate a piece of information For example, your grade point average is 3.5

Statistics is the science of collecting, organizing, presenting, analyzing, and interpreting data to assist in making more effective decisions

As manufacturing has grown, more responsibility is given to the technician to collect and analyze the data from a process using statistical methods

Earliest known publications on statistical inference (combinations and permutations), is from Al-Khalil (717-786), *Book of Cryptographic Messages*. Frequency analysis and sampling by Ibn Adlan (1187-1268).

Types of Statistics

The study of statistics is divided into two categories:

descriptive statistics and inferential statistics

Descriptive statistics involves methods of organizing, summarizing, and presenting data in an informative way. This involves graphical summaries as well as measures of central tendency and dispersion.

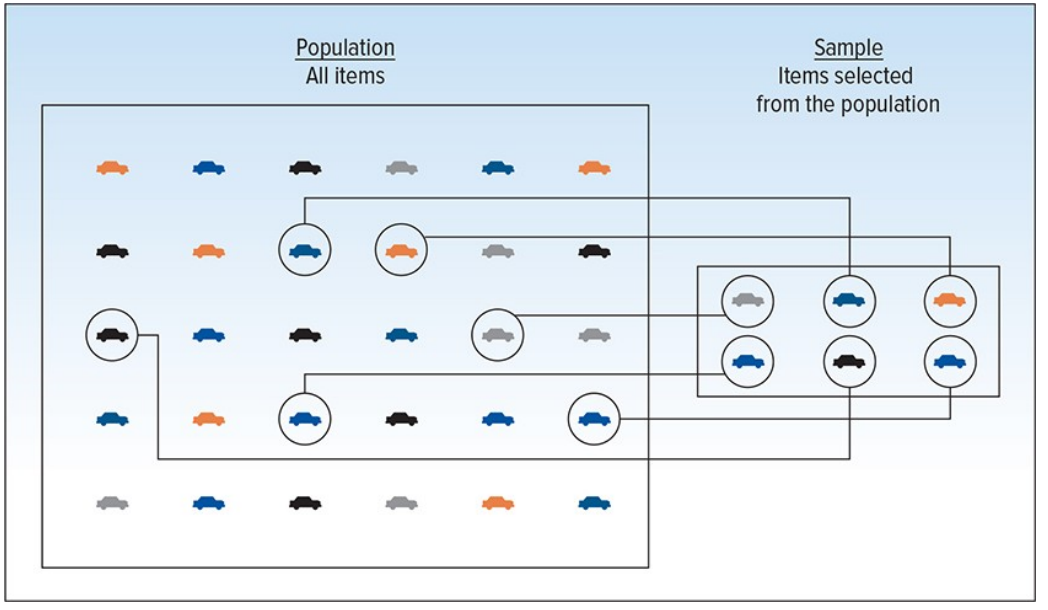
Inferential statistics involves the methods used to estimate a property of a population based on a sample. You might think of inferential statistics as a “best guess” of a population value based on sample information.

Collecting Data

Collecting data using improper methods can spoil any statistical analysis.

A **population** is the entire set of individuals or objects of interest or the measurements obtained from all individuals or objects of interest.

A **sample** is a portion, or part, of the population of interest



Populations and Samples

It is often necessary to take a sample instead of studying every member of a population due to one or more of the following reasons:

1. The prohibitive cost of surveying the whole population
2. The physical impossibility of capturing the entire population

statistic – summarizes the value of a specific variable for sample data

parameter – summarizes the value of a population for a specific variable

Data Sources

When data is collected through a process of an activity by yourself, then it is called **primary data source**

If the data is collected through a process of an activity by someone else, then it is called **secondary data source**