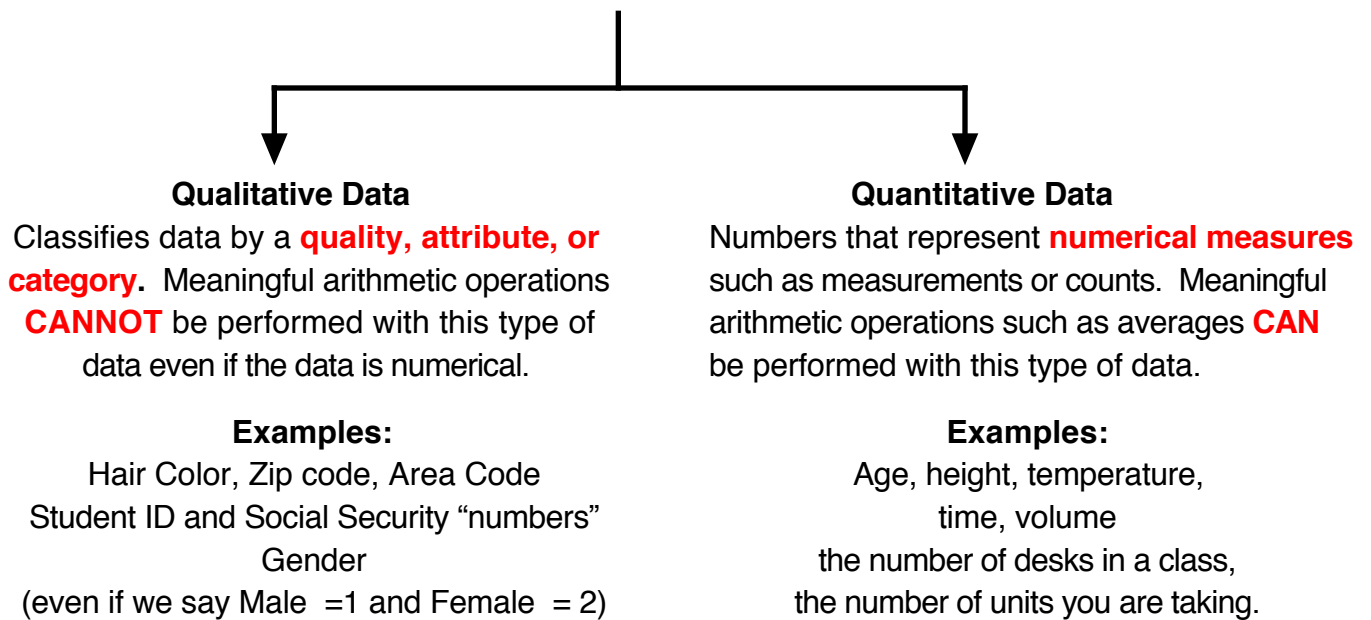


Descriptive Statistics is the act of collecting, organizing, displaying and summarizing information about populations or samples of populations. Inferential statistics involves the use of methods that allow us to take known numerical properties about a sample of the population and then use those numerical properties to infer what numerical properties might be true about the entire population. Because both types of statistics involve the collection of information about samples and populations it is important that we give formal definitions for the terms that form the basis for this course.

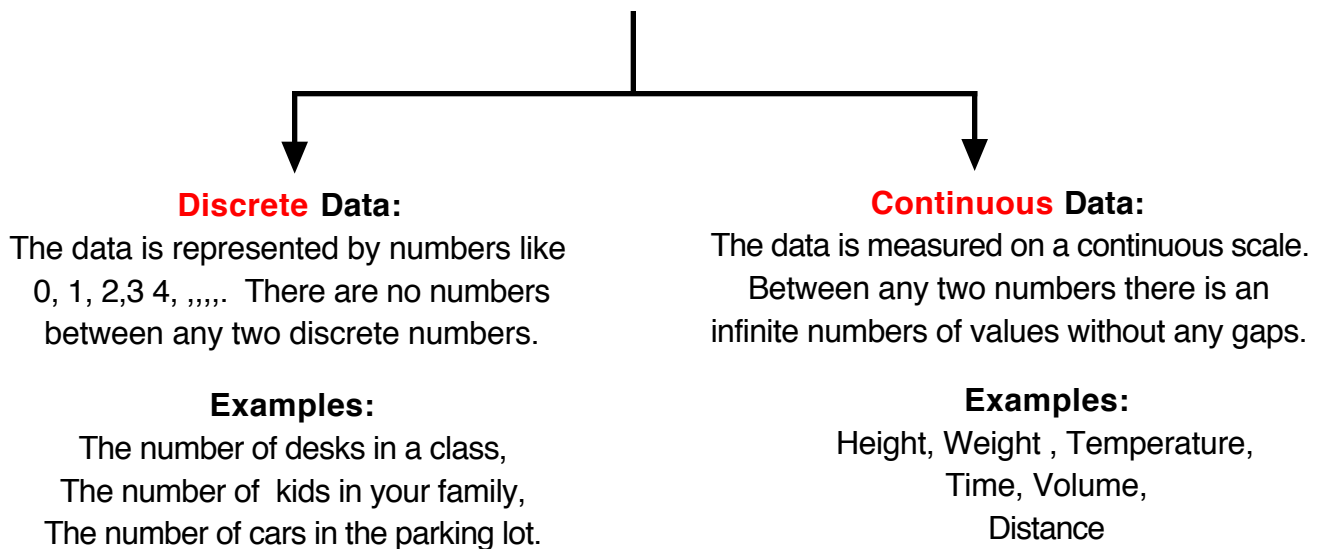
Data

Observations, Measurements or Responses that are collected

There are Two Types of Data



There are two types of **Quantitative Data**



Descriptive Statistics

with Qualitative, Quantitative Discrete and Continuous Data

It is common for a researcher to collect data about a person, an object or an activity. The collection process can involve a survey, field observations made by the researcher or actual measurements taken by the researcher. A **data table** is a collection of observations about a selected group of people with specific characteristics. It may seem that the data is collected first and then the table is designed later but that should not be the case. A researcher first decides what **characteristics** about a group are of interest and names each **characteristic**. The researcher then selects all or part of the population and collects data about each of the selected **characteristics**. The data about the characteristics are then put into a table.

The following table is an example of **descriptive statistics**?

FLC Student Name	Day Student = 1 Night Student = 2	Times a week at the Roost	Type of pizza	Weight of 1 pizza (oz.)
Mary	1	4	Thin crust pepperoni	12.34
Bill	2	8	Thin crust supreme	16.56
Sue	1	5	Thick crust Hawaiian	12.50
Jean	2	4	Thick crust Vegetarian	12.68
Tom	1	6	Thick crust Cowboy	17.97

The **characteristics** the survey was designed to **count** or **measure** was of the **name** of the student, the **gender** of the student, the **number of times a week** that student buys a pizza at the Roost, the **type** of pizza and **weight** of the pizza. 5 Folsom College Students out of the entire population were selected at random. Each of the 5 **individuals** were surveyed about their pizza purchases at the Roost. The label for the name of the **characteristic** is shown at the top of the table and the data about that **characteristics is shown in the column below the label.**

The **individuals selected at random** are Mary, Bill, Sue, Jean and Tom.

The **variables** are the **gender** of each person surveyed, the **number of times a week** they buy pizza, the **type of pizza** purchased and the **weight** of that type of pizza.

Data Types

The values for the number of **times a week they buy pizza** are **quantitative** and **discrete**.

The values for the **weight of each type of pizza** are **quantitative** and **continuous**.

The values for the gender and type of pizza are **qualitative**. (non-numercial)

Descriptive Statistics versus **Inferential Statistics**.

If you managed the Roost you may want to have answers to many questions concerning the buying habits of the students at FLC.

Do males buy more sandwiches at the Roost than females?

How common is it for a student to not eat at the Roost at all?

Do Male FLC students buy more pizza than sandwiches?

The data on a selected group of students can be collected and put into a descriptive table. We can state that the **males listed in the table** buy pizza more times a week than the **females listed in the table do**. That is a true statement as we have the **exact data** about the 2 males and 3 females involved. You can then make true statements **only about the students involved in the survey**. That is the use of descriptive statistics. This material is covered in Chapter 1 to 3.

Can we make any **general observations** about the **ALL the students** at FLC from the descriptive table above? We may want to also say we **THINK males in general** buy pizza more times a week at the Roost than females. This limited data set could not be used to prove or disprove that observation. You **cannot use a fact from a descriptive table based on a few students to infer the same fact is true in a population**. To make an inference that the **population** of males at FLC buy pizza more times a week than the **population** of females at FLC requires that you perform procedures based on **inferential statistics**. This procedure will be covered in the second part of the course.

Example 1

Mr. Eitel sits outside his class entrance and records the gender of 7 students, how many minutes early to class each students was and their letter grade in the class.

The following table is an example of **descriptive statistics**?

Student	Gender		Current grade in the class	minutes early to class
	Male = 1	Female = 2		
S-1	1		C +	1.2
S-2	2		B +	5.7
S-3	1		D	.2
S-4	2		A	8.3
S-5	2		B +	6.0
S-6	1		C	1.9
S-7	2		B	7.4

The **characteristic** the survey was designed to **measure** was gender, current grade in class and how early to class students are. The numbers in the last three columns are the **data values** for the three characteristics for each of the seven individuals.

The **variables** are gender, current grade in class and how early to class the student was.

The **individuals** are S-1, S-2, S-3, S-4, S-5, S-6 and S-7 (actual names were not recorded)

Data Types

Gender and current grade in class are **qualitative data**.

Minutes early to class is **quantitative and continuous data** (even though its reported to 1 decimal places)

Do girls get to class earlier then boys?

Do males get lower grades then boys?

Does the arrival time for class predict the students grade?

Can we make any general observations about students in general based on this table? This limited data set could not be used to prove or disprove an observation about the population. You may decide to conduct a larger survey and perform procedures based on **inferential statistics** that could lead to a conclusion about the entire population.

Example 2

We want to collect data about the class size and classroom number for Mr. Smith, Mrs. Lang, Mr. Larson and Mrs. Jones who teach at a local school. Mr. Smith teaches in room 4 and has 32 students. Mrs. Lang teaches in room 7 and has 28 students. Mr. Larson teaches in room 1 and has 18 students. Mrs. Jones teaches in room 5 and has 24 students.

Individuals: Mr. Smith, Mrs. Lang, Mr. Larson, Mrs. Jones.

Variables: Gender, room number and number of students.

Data: room 4, room 7, room 1, room 5 for the variable Room

28 students, 32 students, 18 students, 24 students for the variable class size

Teacher Name	Gender	Room Number	Number of students
Smith	Male	4	32
Lang	Female	7	28
Larson	Male	1	18
Jones	Female	5	24

Data Types

The values for the number students are **quantitative** and **discrete**.

The values for the gender and Room Number are **qualitative**. (non-numercial)