**Topic 1**

**Data and Variables**

Statistics – science of reasoning from data

**Observational Units** - Set of items or objects

An observation unit might be people, cars, buildings, vegetables. Essentially, they are things.

An Observational Unit has one or more *Characteristics***[[1]](#footnote-1)**

**Characteristic -** a distinguishing trait, quality, or property.[[2]](#endnote-1)

If an observational unit is a person, a characteristic might be hair color, height, weight, shoe size, favorite food, etc. If it were a vegetable, it might be sweetness, weight, color, etc.

Characteristics often *vary*, which means they take on different values

**Variable –** is a characteristic of a set of observational units that can be assigned a number or a category.

**Variability** – refers to the phenomenon of a variable taking on different values or categories from observational unit to observational unit.

*Variability is a key concept in statistics. Handling variability is central to understanding statistics.*

**Data** – is the set of values of a variable(s) for the collection of observational units under consideration.

If your observational units were a classroom,, and your variable was hair color, your data might be {blond, blond, brown, brown, brown, blond, red, brown, …..}, or a color for each student in the class.

(for types of variables, see the document, “Variable Types.docx”, in the content section of blackboard.)

*Being able to identify data types is very important as it determines what type of analysis, both visual and mathematical, will follow.*

Data are a set of values that have been determined. I.e. somehow read, measured, or extracted.

Values of characteristics that have been determined have two components

1. Deterministic component – the actual value
2. Random component – due to error in the measurement or process

1. An example of one characteristic might be the number that comes up (ie the number of dots) that appears when a die (dice) is rolled. An example of many characteristics can be any collection of features that a person might have. [↑](#footnote-ref-1)
2. http://www.merriam-webster.com/dictionary/characteristic [↑](#endnote-ref-1)