

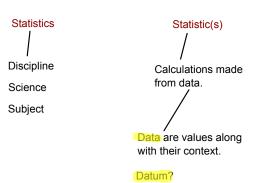
"But where shall I begin?" asked Alice. "Begin at the beginning," the King said gravely, "and go on till you come to the end: then stop." —Lewis Carroll, Alice's Adventures in Wonderland

### What is statistics?

Statistics is a way of reasoning, along with a collection of tools and methods, designed to help us understand the world.



# M. Singh



## Data

Look at these values. Write down what they mean?

Height (Inches):	(hidden)

 $\begin{array}{l} 63.5, 67.5, 67.5, 64, 64, 69, 74, 67\, 61, 65, 72, 69, 64, 62, 67, 66.5, 63, \\ 63, 68, 68, 68, 61, 66, 67.5, 61.5, 63, 63, 65, 63, 65, 62 \end{array}$ 

Wingspan (Inches):

61, 65, 62, 62, 67, 75, 79, 67, 5, 61, 5, 64, 5, 71, 5, 68, 62, 62, 68, 5, 62, 59, 63, 67, 69, 67, 58, 62, 5, 70, 61, 66, 63, 65, 65, 61, 61



WHO: StudentsWHAT: Heights and wingspansWHEN: November 10, 2015WHERE: Our Stats ClassroomWHY: To discover the association between height and wingspanHOW: By using a very long ruler

# Why should I ask these questions?



Because data vary. (population varies, time varies etc so results vary.)

We don't see everything. Even what we do see and measure, we measure imperfectly.

# M. Singh

Who is collecting your data?

&

What are they collecting about you and to what end?

Suggestions everywhere!!



Identify the 5W's and the H

Coffee stations in offices often just ask users to leave money in a tray to pay for their coffee, but many people cheat. Researchers at Newcastle University alter- nately taped two posters over the coffee station. During one week, it was a picture of flowers; during the other, it was a pair of staring eyes. They found that the average contribution was significantly higher when the eyes poster was up than when the flowers were there. Appar- ently, the mere feeling of being watched—even by eyes that were not real—was enough to encourage people to behave more honestly. [NY Times, Dec. 10, 2006]

# Identify the 5W's and the H

Are physically fit people less likely to die of cancer? An article in the May 2002 issue of *Medicine and Science in Sports and Exercise* reported results of a study that followed 25,892 men aged 30 to 87 for 10 years. The most physically fit men had a 55% lower risk of death from cancer than the least fit group.

A Consumer Reports article on energy bars gave the brand name, flavor, price, number of calories, and grams of protein and fat.

 Who: energy bars

 What: brand name, flavor, price, calories, protein, fat

 When: not specified

 Where:not specified

 How: not specified. Are data collected from the label? Are independent tests performed?

 Why: information for potential consumers

 Categorical variables: brand name, flavor

 Quantitative variables: price (US\$), number of calories (calories), protein (grams), fat(grams)

A report on the Boston Marathon listed each runner's gender, country, age, and time.

 Who:
 Boston Marathon runners

 What:
 gender, country, age, time

 When:
 not specified

 Where:Boston
 How:

 How:
 not specified.

 Presumably, the data were collected from registration information.

 Why:
 race result reporting

 Categorical variables:
 gender, country

 Quantitative variables:
 age (years), time (hours, minutes, seconds)

# M. Singh

Let's create a class profile!	facebook
· · · · · · · · · · · · · · · · · · ·	profile
1. What would be our population of interest?	

All the cases we wish we knew about.

2. What attributes(variables) should we record?

holds information about the same characteristic for many cases.

3. How would you measure each attribute?

Units	Categories
Quantitative Variable	Categorical Variable
Examples: salary,	Examples: gender, hair color, zip-code, political affiliation, age(child,adult)

### Should we collect data for each variable?

Let's collect data and create the profile.

Share profiles:

In what ways, did you summarize data?

## Assignment 1

Read Chapter 1. Explore the data collected, and make some observations about the class. What could you report to someone who asked you to describe your class? What did you find interesting (or perhaps surprising) about the class?