What is Applied Statistics?

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What is Statistics About?

- Describing data
- Quantifying uncertainty when making inferences from data
- Building models from data, often for prediction
Example

breadth/length ratios for 20 rectangles found on shoshonic handicraft

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.693</td>
<td>0.749</td>
<td>0.654</td>
<td>0.670</td>
</tr>
<tr>
<td>0.662</td>
<td>0.672</td>
<td>0.615</td>
<td>0.606</td>
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<tr>
<td>0.697</td>
<td>0.628</td>
<td>0.668</td>
<td>0.611</td>
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<tr>
<td>0.601</td>
<td>0.609</td>
<td>0.624</td>
<td>0.553</td>
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<tr>
<td>0.570</td>
<td>0.844</td>
<td>0.571</td>
<td>0.933</td>
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</table>
Decribe the Data Concisely

Mean is 0.661

Median is 0.641

Standard Deviation is 0.0925

Draw a picture
“Generic” probability models (normal, binomial, poisson, etc.)

If $B$ and $L$ are normally distributed, what would $B/L$ be?
Inference

“population”
sample
Statistical Inference

- Use the sample to make inference about the population
- “Test” the hypothesis that the population average ratio is 0.6
- Provide an interval estimate of the population mean
Published an analytical paper on "the measurement of black African ladies' bottoms."

Published studies on the exact length of rope required to hang a man (without decapitating him)

The statistical efficacy of prayer (concluding that it did not work)

[Trivia: While studying the Ovampe tribe, Galton was "accidentally" married to the king's daughter. Galton realized it was time to split – when his blushing bride showed up on her wedding night covered in "reed ochre and butter." ]
Londoners called 1858 "The Year of the Great Stink"
Mary Anderson 1903
THE NEW ACME THE GREATEST WASHING DAY LABOUR SAVER
BIG ENOUGH FOR THE HEAVIEST WASH
SMALL ENOUGH TO BE STORED ON A SHELF

IT CLEANS AS IT WRINGS

Yellow Charleston.
prediction? uncertainty?
**Oehler Ballistic Explorer**

**Trace Report**

<table>
<thead>
<tr>
<th>Name: Federal XM193</th>
<th>Altitude: 1100 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 BC: 0.287</td>
<td>Temperature: 62 °F</td>
</tr>
<tr>
<td>Base Vel: 3080 f/s</td>
<td>Pressure: 30.00 in Hg</td>
</tr>
<tr>
<td>ht Adj: 4.217 MOA</td>
<td>Humidity: 50 %</td>
</tr>
<tr>
<td>d Rng: 100 yards</td>
<td>Wind Speed: 0 mph</td>
</tr>
<tr>
<td>wt Wgt: 55 grains</td>
<td>Wind Dir: 12:00 O'clk</td>
</tr>
<tr>
<td>Sigt Height: 2.5 in</td>
<td>Range Slope: 0 deg</td>
</tr>
<tr>
<td>Close Zeroed Rng: 99.9 yards</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range Yards</th>
<th>Velocity f/s</th>
<th>Energy ft-lb</th>
<th>Path inches</th>
<th>Drop inches</th>
<th>Drift inches</th>
<th>TOF sec</th>
<th>CDFC inches</th>
<th>Mntum lb-f/s</th>
<th>Zero Adj MOA</th>
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<tr>
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<td>3080</td>
<td>1159</td>
<td>-2.50</td>
<td>0.00</td>
<td>0.00</td>
<td>0.0000</td>
<td>2.50</td>
<td>24.2</td>
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<td>1013</td>
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<td>-18.97</td>
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<td>8.23</td>
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<td>-35.52</td>
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<td>0.4494</td>
<td>20.35</td>
<td>18.2</td>
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<tr>
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<td>0.8919</td>
<td>100.78</td>
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<td>26.9</td>
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Remington 7600 Pump Action Rifle 30-06 Synthetic

$374.46

This item is available in most Wal-Mart stores. Prices may vary. Find a Wal-Mart Store.
Washington: New law in Redmond targets shooting range

Posted on Wednesday, February 13, 2002 at 09:38 AM by msoolomon

This Feb 8, 2002, Seattle Times Article reports, "The Redmond City Council unanimously adopted an ordinance this week that requires licenses for shooting ranges. The ordinance is in response to city and residents’ concerns about the safety of the Interlake Sporting Association. The gun club was recently shut down by the King County Department of Licensing while the King County Sheriff’s Office investigated a report that a stray bullet had landed in the parking lot of a nearby business. The gun club is in an unincorporated part of the Rose Hill neighborhood that Redmond plans to annex. The ordinance establishes regulations for the licensing and operation of shooting ranges and restricts the use of certain firearms. Rick Raymond, president of the association, testified at Tuesday's City Council meeting that adoption of the ordinance would force the association out of business. "Ordinances are fine - they protect cities and people - but some are so restrictive businesses can't operate," said Raymond."
Creosote Poles
Robinson Crusoe
Tom Jones
Jane Eyre
The Moonstone
Tristram Shandy
Ivanhoe
Beloved
Portrait of the Artist as a Young Man
The Ambassadors
Evelina
Humphry Clinker
Pamela
This Side of Paradise
The House Behind the Cedars
The Great Gatsby
Go Tell It On The Mountain
Surfacing
Nineteen Eighty-Four
Quicksand
To the Lighthouse
The Sound and the Fury
The Awakening
Winesberg, Ohio
Uncle Tom's Cabin
Roxana
Vicar of Wakefield
Frankenstein
Sons and Lovers
Emma
Castle of Otranto
The Odd Women
Heart of Darkness
Fanny Hill
David Simple
Old English Baron
Silas Marner
Babbitt
Charlotte Temple
Invisible Man
Kathy Goes To Haiti
Mrs. Dalloway
Bleak House
Blind Man with a Pistol
Northanger Abby
The Sun Also Rises
The Good Soldier
The Catcher in the Rye
Wuthering Heights
Lord of the Flies       Martha Quest
The Assistant          Ulysses
The Heart of the Matter Wuthering Heights
The Scarlet Letter     The Red Badge of Courage
The House of Mirth     My Antonia
Sister Carrie          Weiland
Room with a View       The Last of the Mohicans
Uncle Tom's Cabin      The Way of All Flesh
Rise of Silas Lapham   Huckleberry Finn
Tess of the D'Urbervilles The Jungle
The Egoist             Dracula
Kim                   Little Women
Octopus               Barchester Towers
Vanity Fair           Picture of Dorian Gray
The Monk              Gulliver's Travels
Moby Dick             Lolita
The Autobiography of an Ex-Colored Man Native Son
The God of Small Things Things Fall Apart
The Bone People        The Good Earth
John Rabbit's Scarlet Letter Red and Black: The History of Violence
Fanny Hill

Kathy goes to Haiti
Charlotte Temple
Vioxx

![Graph showing time (days) vs. FE (mg) for placebo and rofecoxib]
Author Identification

Mr. Ramsey,
Listen carefully!
I am not referring
to the President.

Mr. Stern,
The Woody
is not a
sensational
success.

Shakespeare,
Sonnets

Primary Colors,
A Novel of Politics

Anonymous,
Hitler's
Two-Volume
Adenauer