GOOD GUESS
1. Invent Yourself: Good guesses
In 1906, Francis Galton observed a contest where 800 farmers guessed an animal's weight. To his surprise, the median of the guesses was within 0.8% of the true measured weight. What is the chance of obtaining such a good match by coincidence? Select an interesting and important parameter, measure it directly, and give a group of human observers the task to guess the value of the parameter. Discuss the results of your experiments.

- Interpretation:
- Use experiment and statistics to found the potential rules between guessing value and true measured value.
Investigate how will the familiarity of individuals influence the accuracy of their guessing.
Will the familiarity influence the accuracy of guessing experiment setting

- Parameter 1: Heights of investigator & Weights of books.
- Why:
  - Everybody can assess others heights according to their own.
  - The concept of weights is less familiar to people than the heights.
Parameter 2: The size of investigator’s shoes (European size)

- male’s guessing values
- female’s guessing values

Why: Female is less familiar to size of male’s shoes, contrarily as well as male.
Will the Familiarity Influence the Accuracy of Guessing

Procedure

- We randomly surveyed more than 80 people in Shenzhen Book City, Shenzhen, China.
- For every respondents, we, firstly, held a book in front of them, without letting them weigh or even hold the book, and asked the weights of the book.
- Then, we asked our respondents the guessing value of our interviewer’s heights and recorded both value in a data table.
After that, asked our respondents to guess the size of our interviewer’s shoes, without comparing with their own.

Finally, we integrated male’s guessing value and female’s in one data table separately. Then we get two pairs of data.
STATISTICS 1: INVESTIGATOR’S HEIGHTS & BOOK’S weights

The true value

<table>
<thead>
<tr>
<th>Heights</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>183</td>
<td>1.39</td>
</tr>
</tbody>
</table>

Mean of guessing value

<table>
<thead>
<tr>
<th>Heights</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>181.607142857143</td>
<td>1.69285714285714</td>
</tr>
</tbody>
</table>

(Guessing value - True Value) / True Value

<table>
<thead>
<tr>
<th>Heights</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.76%</td>
<td>21.79%</td>
</tr>
</tbody>
</table>
STATISTICS 2: GUESSING VALUE OF SHOES SIZE (MALE VS. FEMALE)

Distribution of male’s guessing values
(Frequency vs. Heights)

Distribution of female’s guessing values
(Frequency vs. Heights)

The true value
44

<table>
<thead>
<tr>
<th>Mean of guessing value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>43.8095238095238</td>
</tr>
</tbody>
</table>

(Guessing value - true value) / true value

-0.042%  
-5.6%
THE LAW OF LARGE NUMBER

In probability theory, the law of large numbers (LLN) is a theorem that describes the result of performing the same experiment a large number of times. According to the law, the average of the results obtained from a large number of trials should be close to the expected value, and will tend to become closer as more trials are performed.

– Wikipedia
Our interviewer is relatively high, so the numbers of respondents who was shorter than our interviewer were slightly more than those who are higher.
WHAT WE HAVE FOUND

- Familiarity do have considerably influence to the accuracy of guessing. I believe the LLN do not automatically generate the correct expected value.

- More the sample is, more accurate the mean of guessing value approach the expected value.