

# Intermediate Lab X

## A grand exploration of table widths

Douglas Armstead

January 22, 2015

### Abstract

We measured the width of several lab tables to get experience with uncertainty. We found the width to be  $21.3 \pm 0.2\text{cm}$ . The standard deviation for our measurements was  $0.3\text{cm}$ .

## 1 Introduction

Dealing with uncertainty is an inherent part of experimentation. While central measures can be misleading for non-normal distributions (e.g., see mean income vs median income in the US) as can standard deviations when rare extreme events are important (e.g., see rogue waves) they are often useful.

## 2 Procedure

We used a two meter stick to measure the width of several tables at several points. Care was taken to account for parallax and to make sure the stick was square with the table.

## 3 Data Acquisition

The raw data for one table appears in Table 1

| measurement | value (cm) |
|-------------|------------|
| 1           | 21.4       |
| 2           | 21.3       |
| 3           | 21.7       |
| 4           | 20.9       |

Table 1: This is a table with data, it matters that the LaTeX label comes after the caption.

## 4 Analysis

### 4.1 Calculations

We calculated the mean via Eq. 1

$$\langle w \rangle = \frac{1}{N} \sum_{i=1}^N w_i \quad (1)$$

and standard deviation via Eq. 2. From this we found the error in the mean.

$$\sigma_w = \sqrt{\frac{\sum_{i=1}^N (w_i - \langle w \rangle)^2}{N}} \quad (2)$$

### 4.2 Results

Width =  $21.3 \pm 0.2 \text{ cm}$

## 5 Conclusion

It is worth noting that the standard deviation and the error in the mean are different.