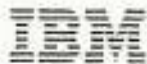

Technical Report



Name Length Statistics for Touch-Screen Buttons

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ABSTRACT

Personal Digital Assistants (PDAs) are small computing devices that support personal organization. Because they are small, PDAs do not have much display area. A common type of data to present to a PDA user is a person's name in applications such as address books and telephone quick-dialers. The purpose of this study was to estimate the distribution of lengths of names in the United States. This information is useful for designers of PDA software who need to present names to users in touch-screen buttons, but must work within the size constraints imposed by PDAs. The mean length of names in a sample of 100 names taken from a phone book was 13.8 characters with a standard deviation of 2.543 (presented in a last name, first name format). Therefore, a touch-screen button that can show 20 characters will show a person's complete name 99.2% of the time.

Introduction

Computer software designers must meet multiple objectives when they design a program. For example, they must both satisfy their users' requirements and write a program that will work within the constraints of the computing device. The more constrained the device, the greater the challenge.

Personal Digital Assistants (PDAs) are small computing devices that support personal organization. Because they are small, PDAs do not have much display area. A common type of data to present to a PDA user is a person's name in applications such as address books and telephone quick-dialers. The purpose of this study was to estimate the distribution of lengths of names in the United States. This information is useful for designers of PDA software who need to present names to users in touch-screen buttons, but must work within the size constraints imposed by PDAs.

Method

I collected a random sample of 100 names from the Pompano, FL white pages telephone book. I organized the names in a database using a "Last name, First Name" format, then calculated the length of each name, including the space and comma between the last and first names.

Results

The mean name length was 13.8 characters, with a standard deviation of 2.543. The standard error of the mean was 0.025. The minimum length was 8 characters, and the maximum length was 18. Figure 1 shows the plot of the observed values against the expected values given a normal distribution. While not perfectly normal, the distribution is approximately normal. Given a normal distribution, Table 1 shows the percentage of names that would fit in touch-screen buttons that vary from 10 to 22 characters wide. For example, the data show that a button 20 characters wide would accommodate 99.2% of names in the United States. Finally, Figure 2 is a graph of the percentage of names that would fit in touch-screen buttons from 10 to 22 characters wide, showing both the observed sample and a normal distribution.

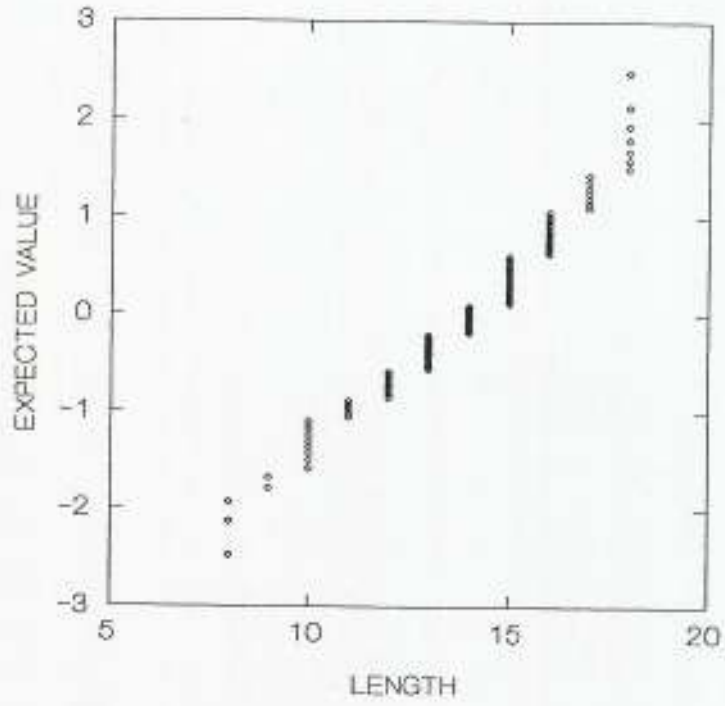


Figure 1. Name lengths plotted against expected normal distribution values

Table 1. Percentage of names fitting as a function of touch-screen button width

<u>Button Width (in characters)</u>	<u>Z-score</u>	<u>Percent Fitting</u>	<u>Improvement</u>
10	-1.49	6.8	-
11	-1.10	13.6	6.8
12	-0.71	23.9	10.3
13	-0.31	37.8	13.9
14	0.08	53.2	15.4
15	0.47	68.1	14.9
16	0.87	80.8	12.7
17	1.26	89.6	8.8
18	1.65	95.0	5.4
19	2.04	97.9	2.9
20	2.43	99.2	1.3
21	2.83	99.8	0.6
22	3.22	99.9	0.1

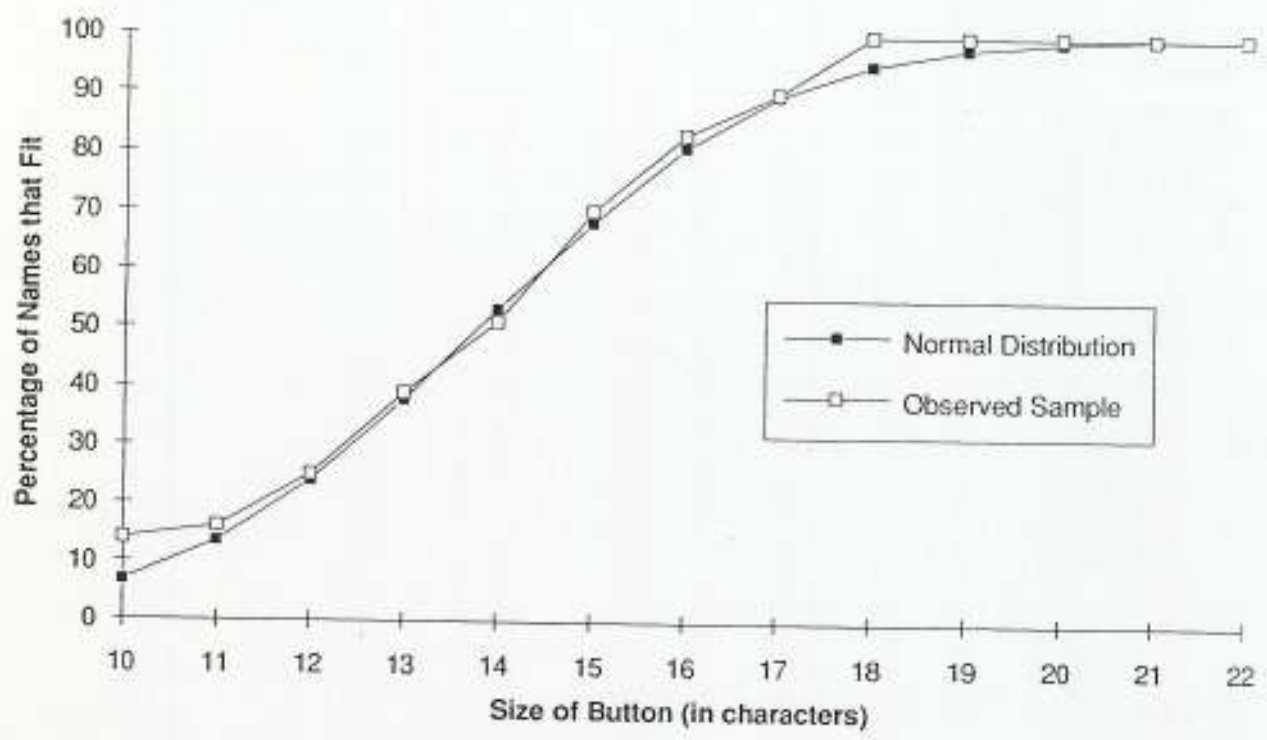


Figure 2. Percentage of names fitting as a function of button size

Discussion

This information is useful for designers of PDA software who need to present names to users in touch-screen buttons, but must work within the size constraints imposed by PDAs. Most PDAs should be able to support button widths of 20 characters, which will show a person's complete name 99.2% of the time. If a designer must use buttons smaller than 20 characters, Table 1 will help the designer make the trade-off between button size and the percentage of full names the button will show.

Because the sample consisted of names from only one city in South Florida, it may not be representative of the United States at large. However, increasing the scope of sampling within the United States would probably not change the estimate of the distribution substantially. The names in some countries, such as Greece, Germany, and Thailand, are usually longer than names in the United States. However, an informal examination of names from a database of IBM employees in Thailand showed that a 20-character button would display the entire last name and first initial of the longest name found. In most cases, this would be an adequate amount of information to show to a PDA user in a touch-screen button.