

Sampling Distributions

Objectives

- 1 Obtain a sampling distribution of sample means

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Note: We will sample with replacement. Differences in sampling with and without replacement become negligent as sample sizes increase.

Example 1

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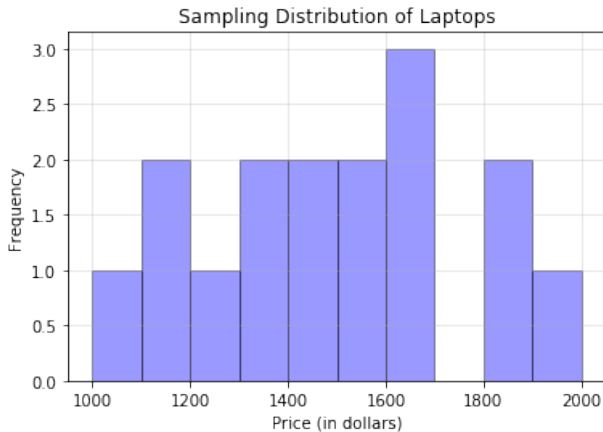
| Sample | Sample Mean | Sample | Sample Mean |
|------------|-------------|------------|-------------|
| 1000, 1000 | 1000 | 1600, 1000 | 1300 |
| 1000, 1200 | 1100 | 1600, 1200 | 1400 |
| 1000, 1600 | 1300 | 1600, 1600 | 1600 |
| 1000, 2000 | 1500 | 1600, 2000 | 1800 |
| 1200, 1000 | 1100 | 2000, 1000 | 1500 |
| 1200, 1200 | 1200 | 2000, 1200 | 1600 |
| 1200, 1600 | 1400 | 2000, 1600 | 1800 |
| 1200, 2000 | 1600 | 2000, 2000 | 2000 |

Example 2

Create a histogram of the sample means from Example 1.

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Example 3

Determine the mean and standard deviation of the sample means.

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Std. Dev \approx \$271.57

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$$\sigma \approx \frac{\sigma_{\bar{x}}}{\sqrt{n}}$$

where $\frac{\sigma}{\sqrt{n}}$ is called the **standard error of the mean**.

Example 4