A screenshot of a computer

Description automatically generated

This bar chart represents the **sampling averages distribution** based on the parameters you provided:

1. **Number of Samples (m): 4000**
   * This is the total number of samples generated.
   * Each sample contributes to the distribution of the sample averages.
2. **Sample Size (n): 30**
   * Each sample contains 30 observations randomly drawn from the parent distribution.
3. **X-Axis (Frequency)**
   * The frequency of how often each sampled average occurs is normalized to a proportion (frequency values sum to 1).
4. **Y-Axis (Sampling Averages)**
   * This axis represents the possible values of the averages computed for each of the 4000 samples.
5. **Bar Chart**
   * The chart shows that most of the sampling averages are concentrated around **3.15**, with very few at other values.
   * This clustering around the mean indicates that as the number of samples increases, the sampling averages tend to approach the **theoretical mean** of the parent distribution.
6. **Mean and Variance**
   * **Mean of Sampling Averages: 3.15**  
     This matches the theoretical mean of the parent distribution (as expected by the Central Limit Theorem).
   * **Variance of Sampling Averages: 0.05**  
     This is much smaller than the parent distribution's variance because the variance of the sampling distribution is reduced by the factor 1n\frac{1}{n}n1​ (sample size).

**Observations**

* **Central Limit Theorem (CLT)**: The results align with the CLT, which states that the distribution of sample means (sampling averages) approaches a normal distribution as the sample size increases, regardless of the parent distribution's shape.
* **Higher Sample Size nnn**: Increasing nnn reduces the variance of the sampling averages, making the distribution narrower.
* **Larger Number of Samples mmm**: Increasing mmm improves the smoothness and accaccuracy of the sampling distribution's approximation to the theoretical normal distribution.