

clt

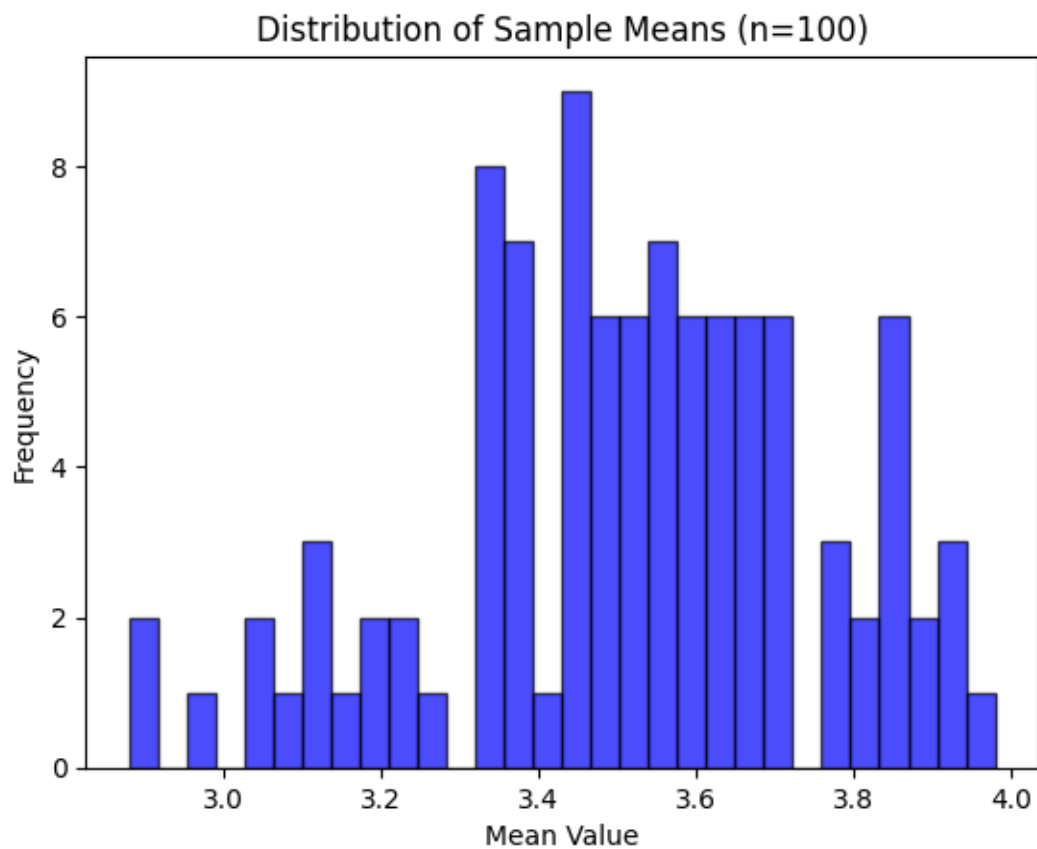
November 1, 2024

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[3]: # Import necessary functions and libraries
from numpy.random import seed # For setting a random seed
from numpy.random import randint # For generating random integers
from numpy import mean # For calculating the mean of an array
from matplotlib import pyplot # For plotting graphs

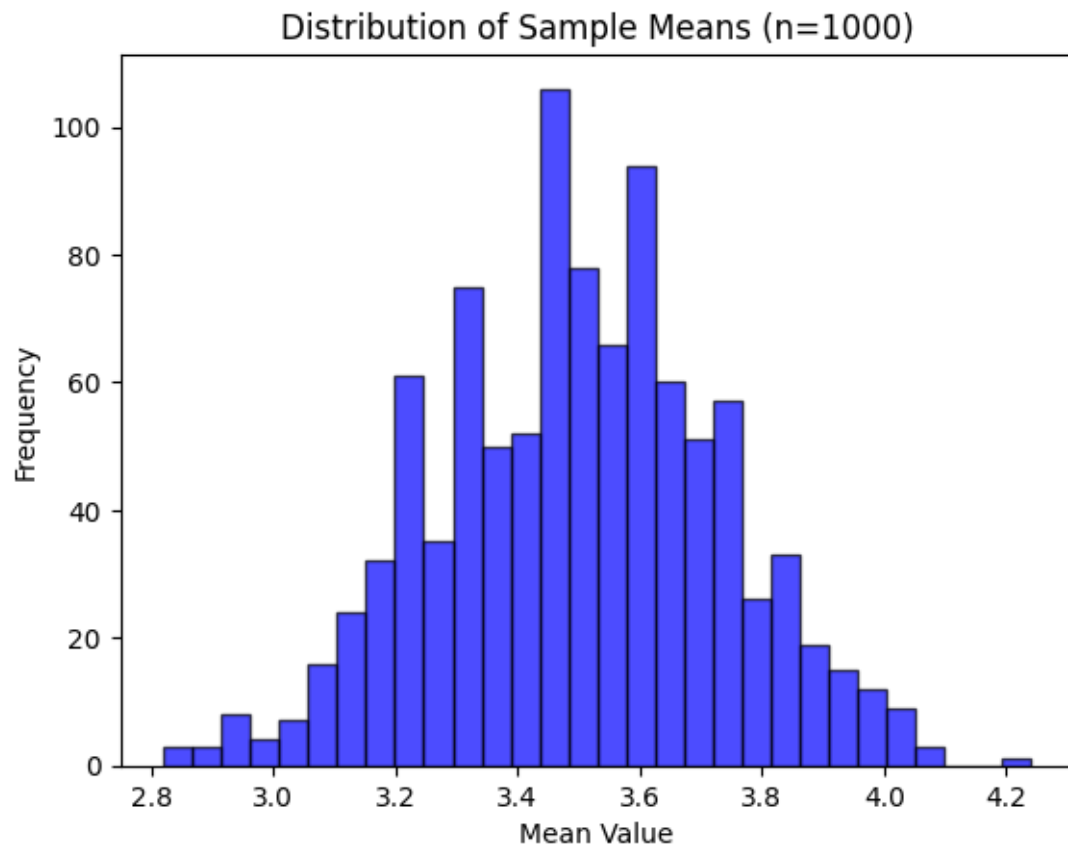
[4]: # Seed the random number generator for reproducibility
seed(1)

[5]: def plot_clt(n):
    # Calculate the mean of 50 dice rolls n times
    means = [mean(randint(1, 7, 50)) for _ in range(n)]
    # Plot the distribution of sample means as a histogram
    pyplot.hist(means, bins=30, alpha=0.7, color='blue', edgecolor='black') #
    ↳ Added bins, alpha, color, and edgecolor for better visibility
    pyplot.title(f'Distribution of Sample Means (n={n})') # Title indicating
    ↳ the number of samples
    pyplot.xlabel('Mean Value') # Label for the x-axis
    pyplot.ylabel('Frequency') # Label for the y-axis
    pyplot.show() # Display the plot

[6]: # Call the function to plot the distribution of sample means for 100 samples
plot_clt(100)
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[7]: # Call the function to plot the distribution of sample means for 1000 samples  
plot_clt(1000)
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[9]: # Call the function to plot the distribution of sample means for 10000 samples  
plot_clt(10000)
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