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#python libraries used for this code
import numpy as np
import matplotlib.pyplot as plt
import random
import statistics
n_iterations = 100000 #define number of points in histogram
n_darts = 10000 #define number of darts thrown
circle = 0 #initialize circle counts
square = 0 #initialize square counts
hist_data = [] #initalize empty array for histogram

#big loop
for i in range(n_iterations):

    circle = 0
    square = 0
    #random generator loop
    for j in range(n_darts):

        x = random.random() #normalized from (0,1) as floats
        y = random.random()

        if (((x*x) + (y*y)) <= (1.0)):
            circle += 1.0
            square += 1.0
        else:
            square += 1.0

    hist_data.append(4*(float(circle)/float(square)))

average = statistics.mean(hist_data)
stdev = statistics.stdev(hist_data)

plt.hist(hist_data, 50)
plt.vlines(np.pi, ymin=0, ymax=8000, linestyles="--", label="True pi",
color="black")
plt.legend()
plt.ylabel('Probability')
plt.xlabel('Pi Extimate')
plt.show()

print("Average Value: " +str(average))
print("Standard Deviation: " +str(stdev))
```