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1 # Practical-2: The aim of this code is to simulate coin tosses and calculate the probabilities of getting heads and tails
  based on the number of tosses specified by the user.
2
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6
7 import random
8 import numpy as np
9 import matplotlib.pyplot as plt
10 from scipy.stats import norm
11
12 def singleToss():
13     return random.choice(["H", "T"]) == "H"
14
15 def simulateTrial():
16     numHeads = sum(1 for _ in range(10) if singleToss())
17     return numHeads / 10
18
19 def main():
20     numTrials = int(input("-->> Enter the number of Trials (Each Trial consist of 10 flips of a coin): "))
21
22     probabilities = [simulateTrial() for _ in range(numTrials)]
23
24     meanProbability = np.mean(probabilities)
25     print(f"\n--> Probability of Getting a Head After {numTrials} trials of 10 Coin Tosses: {meanProbability} or
  {(meanProbability * 100):.4f}%")
26
27     plt.xlabel('Probability of Heads')
28     plt.ylabel('Frequency')
29     plt.title('Distribution of Probability of Heads')
30
31     mu, std = np.mean(probabilities), np.std(probabilities)
32     xmin, xmax = plt.xlim()
33     x = np.linspace(xmin, xmax, 100)
34     p = norm.pdf(x, mu, std)
35     plt.plot(x, p, 'k', linewidth=2)
36
37     plt.show()
38
39 main()
40
41 print("\n-*-*-*-*END OF PRACTICAL 2-*-*-*-*\n")
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