#1

import random

random\_numbers = []

for i in range(1000):

number = random.uniform(60, 70)

random\_numbers.append(number)

print(random\_numbers)

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62.86336652333539, 65.29082716476722, 64.73609797636317, 61.85040600144928, 68.55222041783281, 61.29735264183899, 64.97883040102218, 64.63391600504389, 68.15883457426237, 62.05379803350414, 60.54787702549293, 67.34566966666647]

#2

import random

import statistics

random\_numbers = []

for i in range(1000):

  number = random.uniform(60, 70)

  random\_numbers.append(number)

mean = statistics.mean(random\_numbers)

stdev = statistics.stdev(random\_numbers)

print("Mean of random\_numbers: ", mean)

print("Standard deviation of random\_numbers: ", stdev)

Mean of random\_numbers: 64.95956482342264

Standard deviation of random\_numbers: 2.8908636520223325

#3

import random

import statistics

import matplotlib.pyplot as plt

random\_numbers = []

for i in range(1000):

  number = random.uniform(60, 70)

  random\_numbers.append(number)

mean = statistics.mean(random\_numbers)

stdev = statistics.stdev(random\_numbers)

plt.hist(random\_numbers, bins=20)

plt.xlabel('Value')

plt.ylabel('Frequency')

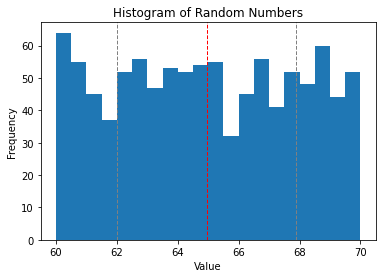
plt.title('Histogram of Random Numbers')

plt.axvline(mean, color='red', linestyle='dashed', linewidth=1)

plt.axvline(mean - stdev, color='gray', linestyle='dashed', linewidth=1)

plt.axvline(mean + stdev, color='gray', linestyle='dashed', linewidth=1)

plt.show()



#4

import random

import statistics

random\_numbers = []

for i in range(1000):

  number = random.uniform(60, 70)

  random\_numbers.append(number)

sample = random.sample(random\_numbers, 30)

print("Sample of 30 numbers:", sample)

Sample of 30 numbers: [66.44975267986963, 68.82095076049188, 66.07320971311611, 64.38818776836145, 66.62063765461653, 67.24913407446445, 62.59846292561414, 66.05828180004997, 60.057584869330306, 68.17529819487794, 68.91326821517008, 62.42268708077525, 68.64568089411154, 60.160657776385655, 67.5235615960855, 69.79345603510744, 66.61712680402691, 67.5283430874107, 69.89051745791124, 62.593278118331234, 60.03638315080579, 67.39122282768122, 65.09936250503716, 67.8699000905646, 66.15604057306142, 65.84686752125253, 66.77452401656222, 65.73518649751615, 64.67119074718525, 62.17560412674011]

#5

import random

import statistics

random\_numbers = []

for i in range(1000):

  number = random.uniform(60, 70)

  random\_numbers.append(number)

sample\_means = []

for i in range(500):

  sample = random.sample(random\_numbers, 30)

  sample\_mean = statistics.mean(sample)

  sample\_means.append(sample\_mean)

print("Sample means:", sample\_means)

Sample means: [63.83866268899155, 65.36698707253235, 64.9840050108921, 64.82324818835738, 65.3843320564665, 65.89047627156897, 64.1437735651545, 65.56471674846613, 65.16462458942613, 66.0243387712567, 65.1233519232031, 63.8426998305655, 65.09699104523638, 64.70470143736082, 65.51136802211208, 65.75463166757662, 64.78882723138994, 65.02549825478438, 64.34821504708655, 65.65566851236439, 64.81013134581885, 65.09916899982505, 65.70884176585795, 65.43745686146981, 64.4565943950619, 65.5465878206723, 65.09696673882081, 64.62510809031632, 64.98304649026052, 65.15140961080385, 65.2751846889111, 65.69878903468528, 65.11231290634319, 64.94361211817535, 64.75956744546166, 64.83260893358285, 65.34884181529044, 65.17282604418142, 65.0617043346792, 64.7901361412212, 64.24252306114957, 66.24679245418771, 65.49981369376668, 64.9312687739577, 64.86298240061684, 65.52150082693208, 65.24515376007103, 64.54601640060774, 65.32356008086809, 65.54580323014387, 64.20847878696067, 65.0579958185789, 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#6

import random

import statistics

random\_numbers = []

for i in range(1000):

  number = random.uniform(60, 70)

  random\_numbers.append(number)

sample\_means = []

for i in range(500):

  sample = random.sample(random\_numbers, 30)

  sample\_mean = statistics.mean(sample)

  sample\_means.append(sample\_mean)

print("Sample means:", sample\_means)

Sample means: [64.63842186022711, 64.57229225883123, 65.47708452328582, 65.27951118386922, 64.19143788343436, 65.23411902759652, 65.00895891461768, 65.8316553774931, 64.31488914175077, 65.40860537617512, 65.33216192401382, 64.96485722701344, 65.01491205919235, 65.03515313838366, 65.18637967958942, 65.0257896119495, 65.00597132227061, 64.88636486382525, 64.80557321284672, 65.40264564666944, 64.89153034030004, 65.40068712000834, 64.63391005826229, 63.68991173920422, 64.15177704678939, 65.15750699730292, 65.19242142664652, 65.33087757124272, 66.12899333313791, 65.04469235772436, 64.16464432181319, 64.36897327340446, 65.87467656597278, 64.64367018594709, 65.09886104989037, 66.08674664271501, 65.76852720227163, 64.48486513570441, 64.73967010650806, 64.86107081134931, 64.64943160761487, 64.65603762427088, 65.16800420324758, 65.0193034647146, 65.04786501657603, 65.41260537605872, 64.18171302699139, 65.87707000597027, 65.4967322153707, 63.91163118596787, 65.30336921533089, 66.0584050828213, 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#7

import random

import statistics

import matplotlib.pyplot as plt

random\_numbers = []

for i in range(1000):

    number = random.uniform(60, 70)

    random\_numbers.append(number)

sample\_means = []

for i in range(500):

    sample = random.sample(random\_numbers, 30)

    sample\_mean = statistics.mean(sample)

    sample\_means.append(sample\_mean)

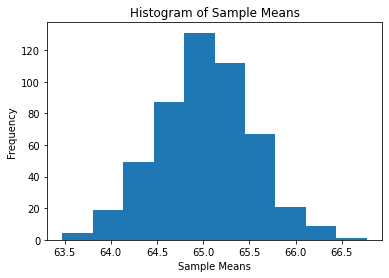
plt.hist(sample\_means)

plt.xlabel("Sample Means")

plt.ylabel("Frequency")

plt.title("Histogram of Sample Means")

plt.show()



#8

import random

import statistics

import numpy as np

random\_numbers = []

for i in range(1000):

    number = random.uniform(60, 70)

    random\_numbers.append(number)

sample\_means = []

for i in range(500):

    sample = random.sample(random\_numbers, 30)

    sample\_mean = statistics.mean(sample)

    sample\_means.append(sample\_mean)

mean\_of\_sample\_means = np.mean(sample\_means)

std\_of\_sample\_means = np.std(sample\_means)

print("Mean of Sample Means:", mean\_of\_sample\_means)

print("Standard Deviation of Sample Means:", std\_of\_sample\_means)

Mean of Sample Means: 64.91623302257665

Standard Deviation of Sample Means: 0.5196786776089055

#10

import random

import statistics

import matplotlib.pyplot as plt

random\_numbers = []

for i in range(1000):

    number = random.uniform(60, 70)

    random\_numbers.append(number)

sample\_means = []

for i in range(500):

    sample = random.sample(random\_numbers, 50)

    sample\_mean = statistics.mean(sample)

    sample\_means.append(sample\_mean)

plt.hist(sample\_means)

plt.xlabel("Sample Means")

plt.ylabel("Frequency")

plt.title("Histogram of Sample Means (n=50)")

plt.show()

