**Assignment Questions:**

Q1. An unbiased coin was tossed 100 times. Compute the probability that tails came up

1. 30 times.
2. More than 35 times
3. Between 60 and 70 times

**Answer: i. 30 times**

2.3170690580135133e-05

**Answer: ii. More than 35 times**

0.9982411791385147

**Answer: iii. Between 60 and 70 times**

0.028404716122262346

Q2. For the data given in the file data.csv, print the covariance and the correlation values.

**Covariance:**

0.00013943667459827156

**Correlation:**

0.021283443533363637

Q3. A 8 faced dice was rolled N times randomly. Compute the probability of every number in the sample space and its expected value.

**Test Cases:**

**Test Case-1:**

Seed Value: 100

Input: 2

0.0 0.0 0.5 0.0 0.0 0.0 0.0 0.5

Expected Value: 5.5

**Test Case-2:**

Seed Value: 150

Input: 3

0.0 0.0 0.0 0.3333333333333333 0.0 0.3333333333333333 0.3333333333333333 0.0

Expected Value: 5.666666666666666

**Test Case-3:**

Seed Value: 90

Input: 1

0.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0

Expected Value: 4.0

**Note: Here we are following the frequentist approach. Therefore, you have to compute the expected values using the probabilities obtained in the previous part (**Y=X^4).

Q4. Calculate the expectation of random variable Y = X^4, where X is another random variable which counts the number of heads in tossing N coins.

**Test Cases:**

**Test Case-1:**

Input: 1

Expected Value:

0.5

**Test Case-2:**

Input: 2

Expected Value:

4.5

**Test Case-3:**

Input: 3

Expected Value:

16.5

**Practice Questions**

Q5. Net Profit of playing game: A game costs the player $1 to play. In that game, a player either wins $10 with a probability of 1/8 or loses $1 with a probability of 7/8. What is the net profit from playing this game for N times?

g=1

w=10

l=-1

n=int(input())

exp=(9\*(1/8))+(-1\*(7/8));

if(n\*exp==int(n\*exp)):

print(int(n\*exp)/1)

else:

print(n\*exp)

Q6. For the data given to you in the file practise.txt. Print the covariance and correlation matrices. Further, plot the matrices as heat maps. You can try any library at your end to accomplish the task.