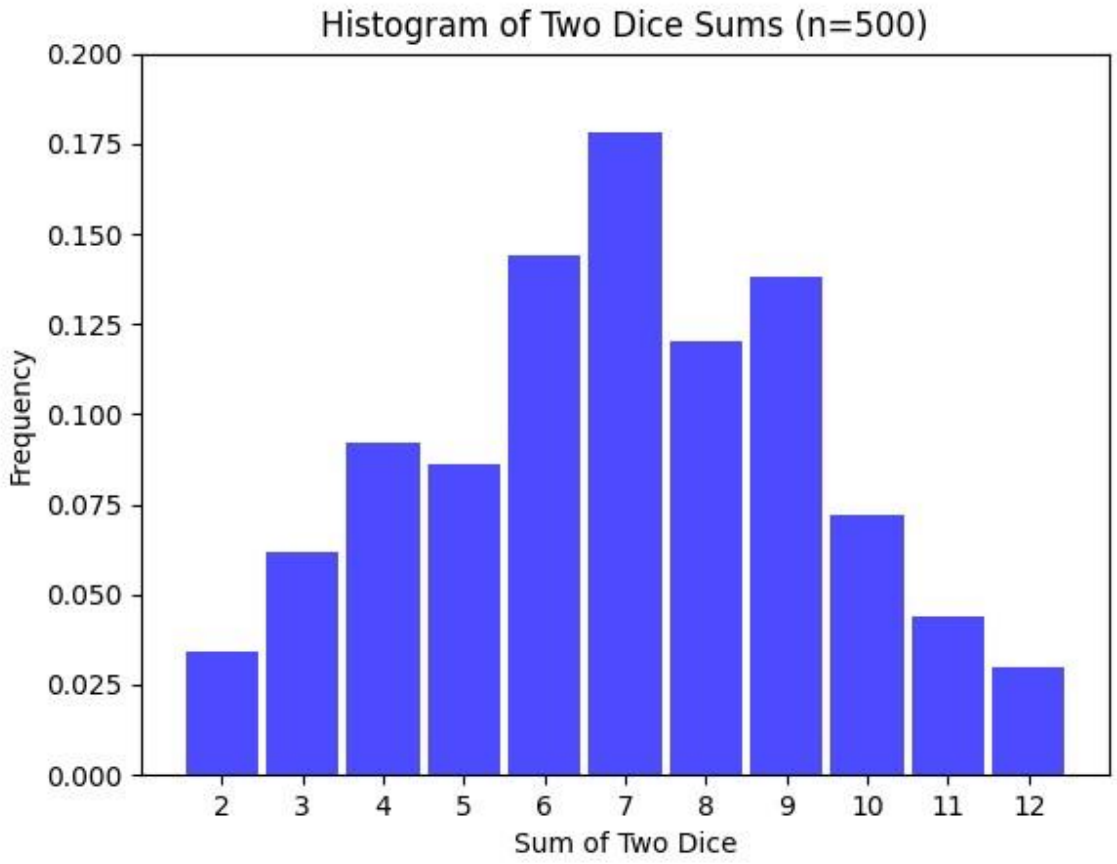
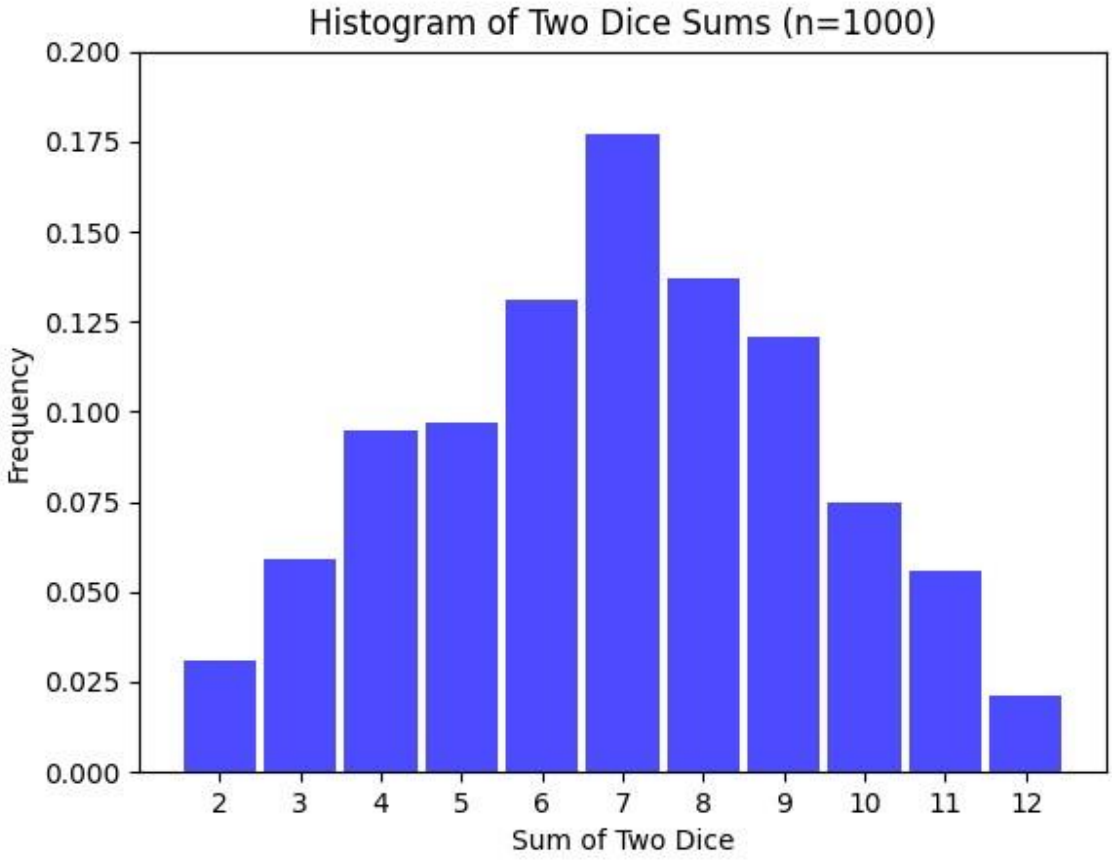
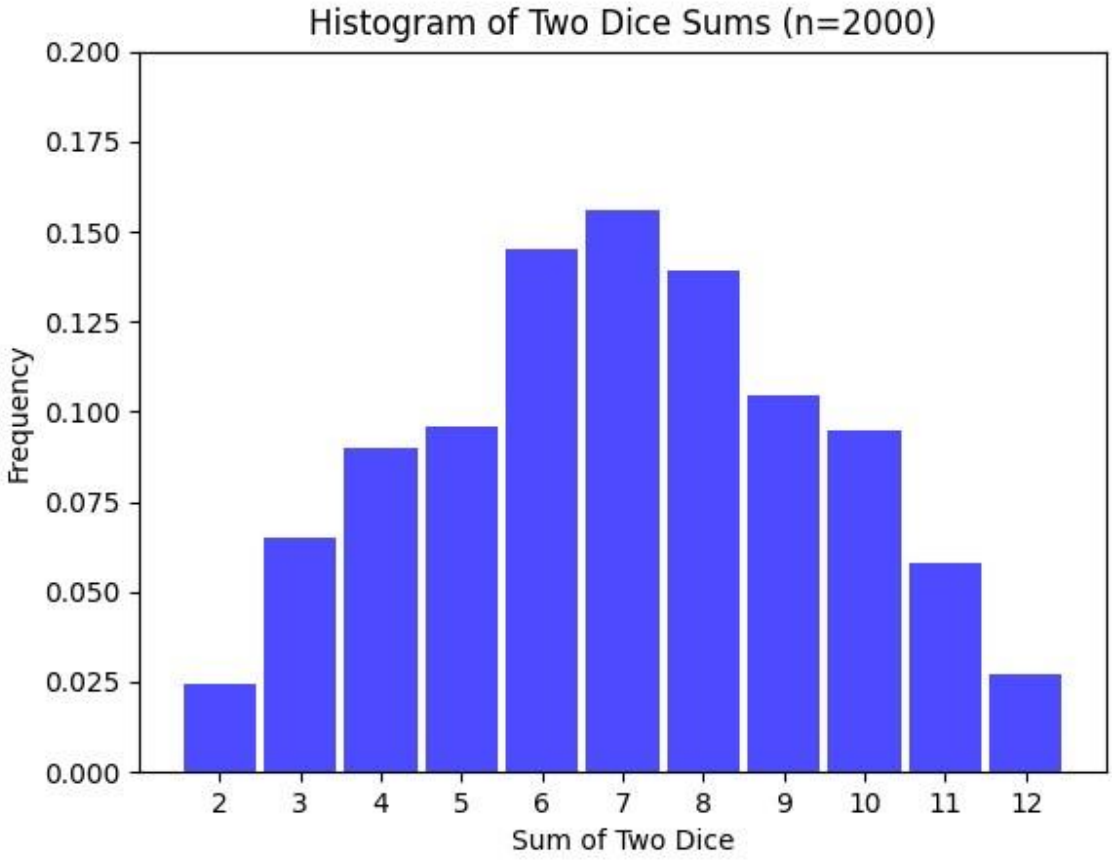
Exercise 1:

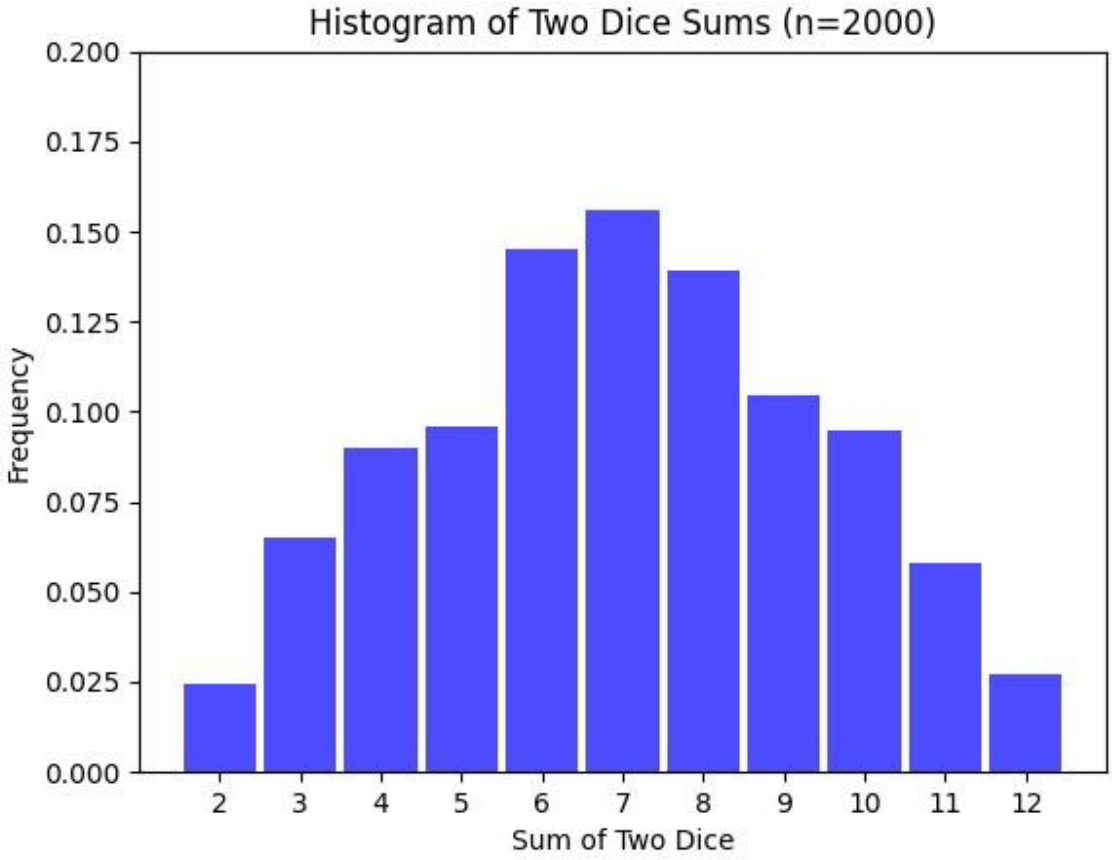
As n increases, the histogram becomes smoother and more closely approximates the theoretical probabilities. When n is small, randomness makes some sums less or more likely to occur. For larger n, the relative frequencies

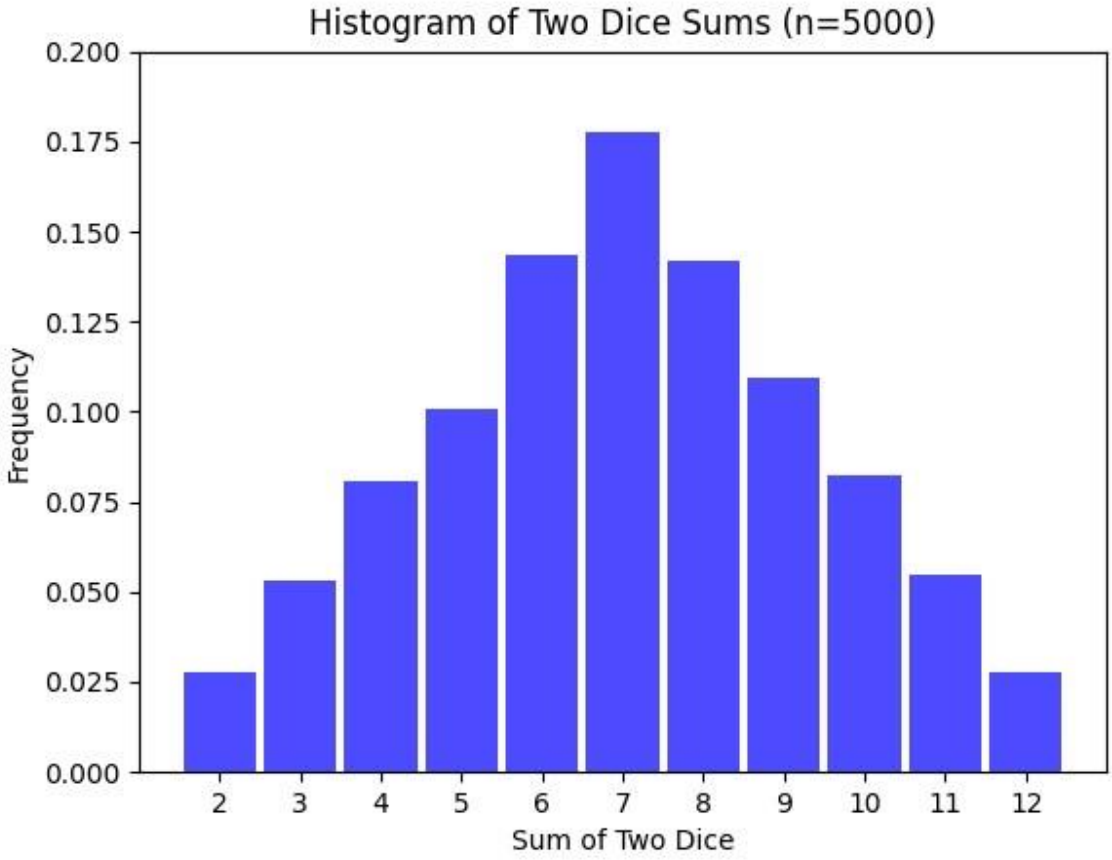


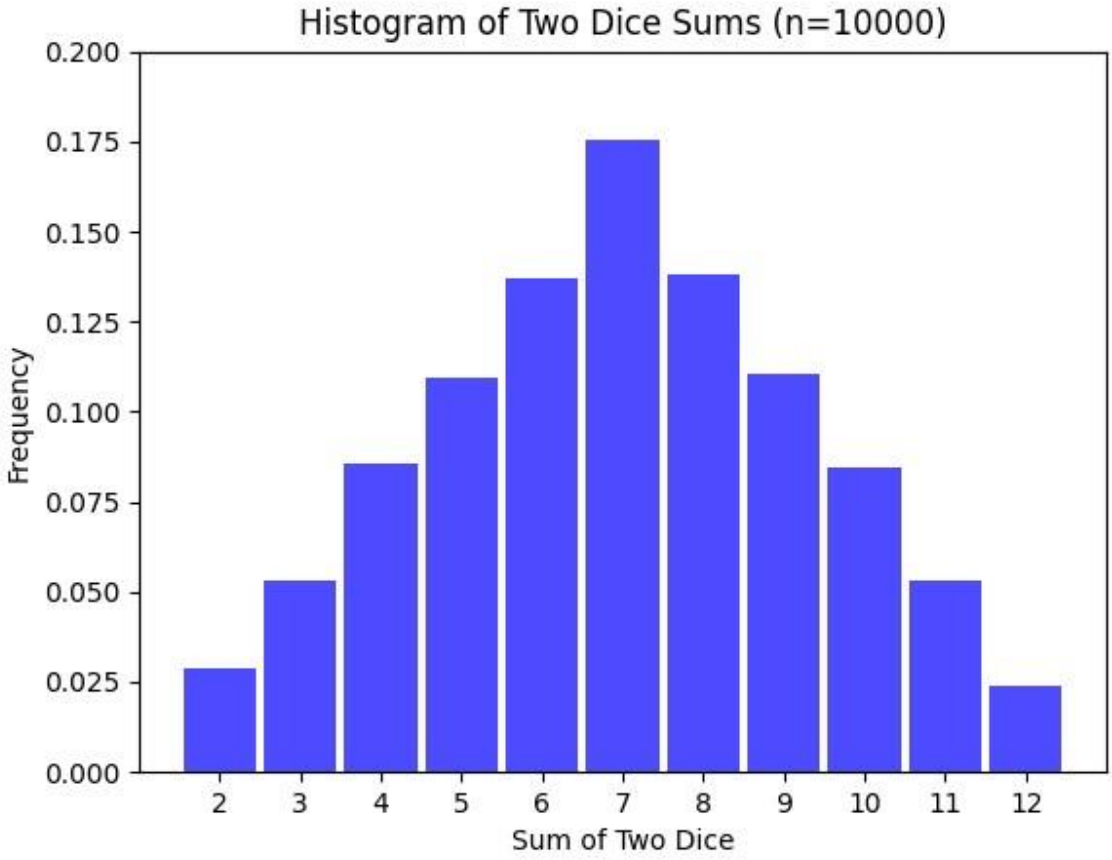
converge toward the expected probabilities.

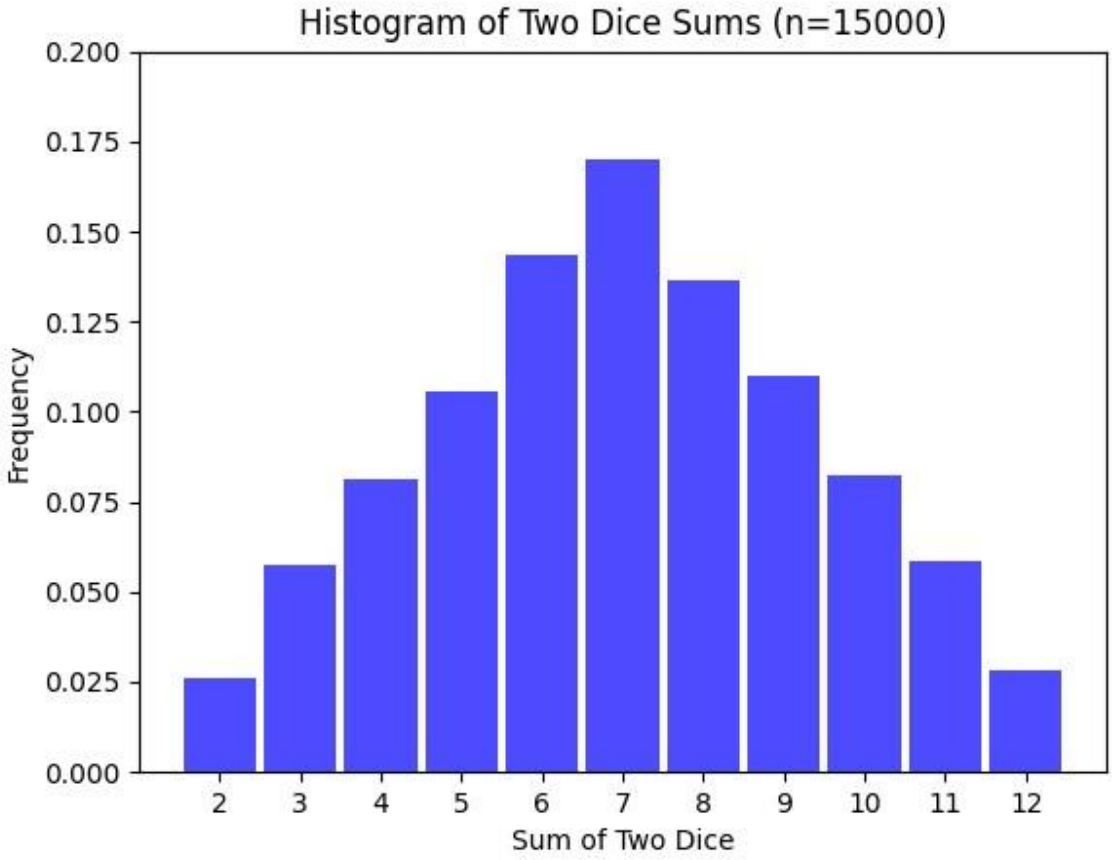

Histogram of Two Dice Sums (n=1000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice

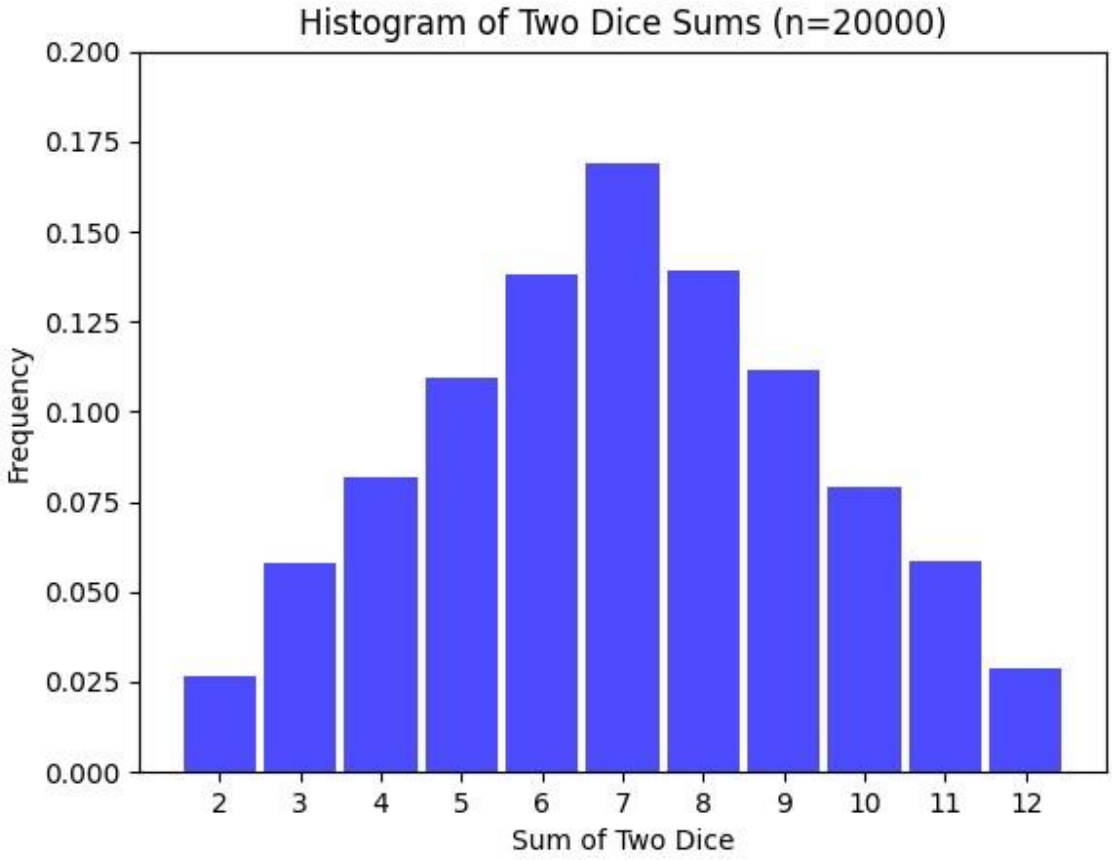

Histogram of Two Dice Sums (n=2000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice

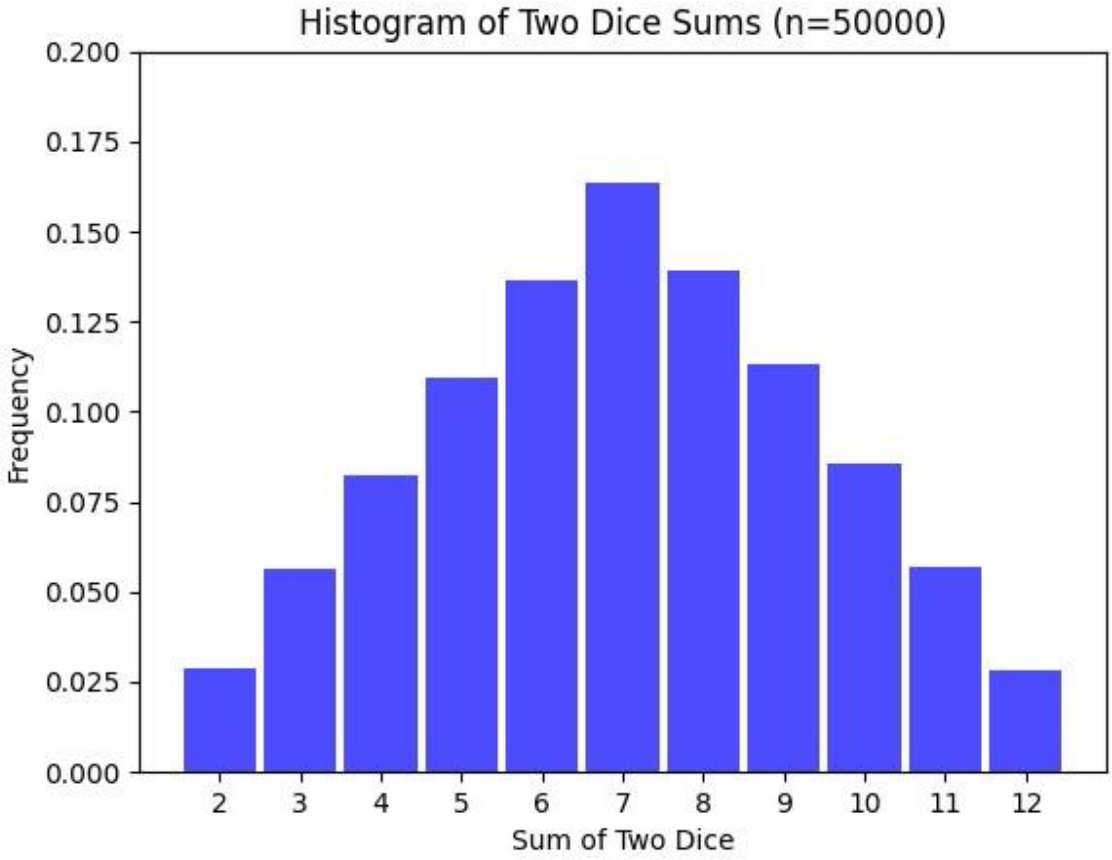

Histogram of Two Dice Sums (n=2000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice


Histogram of Two Dice Sums (n=5000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice

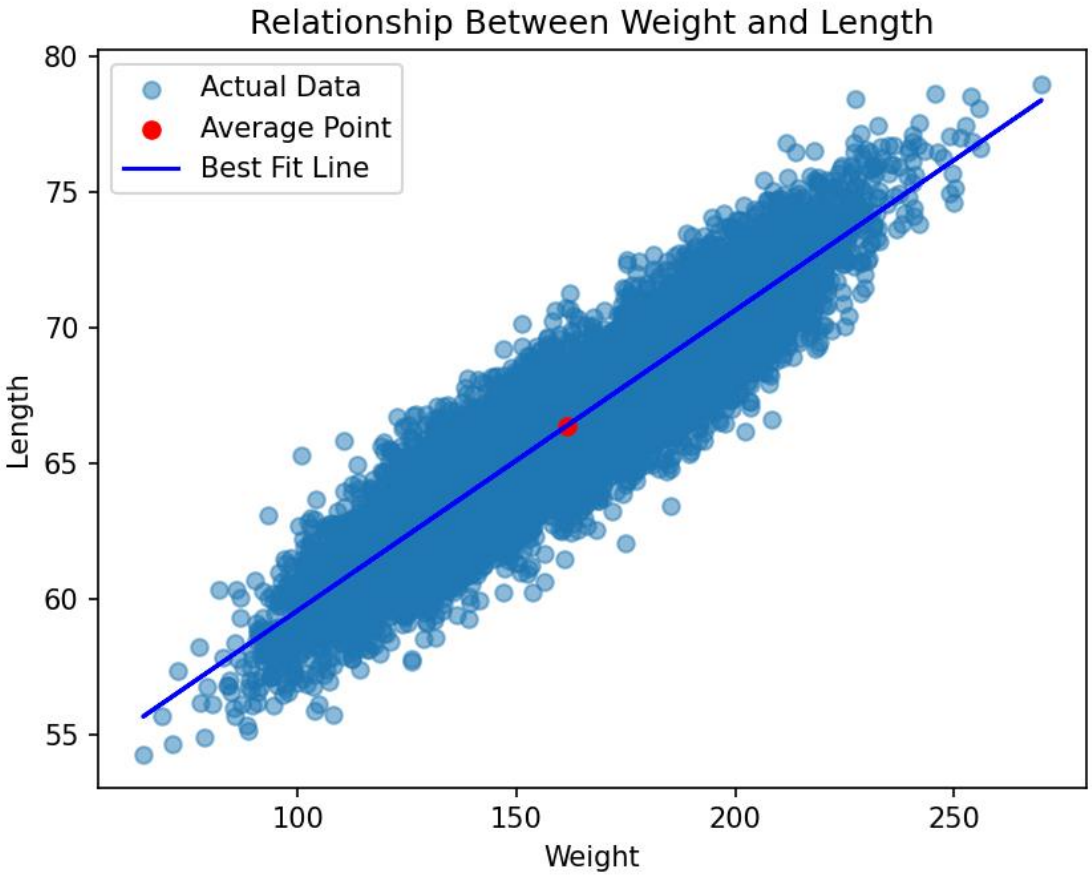

Histogram of Two Dice Sums (n=10000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice


Histogram of Two Dice Sums (n=15000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice


Histogram of Two Dice Sums (n=20000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice


Histogram of Two Dice Sums (n=50000)
Frequency
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
2
3
4
5
6
7
8
9
10
11
12
Sum of Two Dice

Exercise 2



RMSE measures the average error in prediction. A lower RMSE value indicates a better fit of the model to the data. In this case, RMSE = 1.46, meaning that, on average, the model's height predictions deviate by about 1.46 units from the actual values. The R2 score represents the proportion of variance in height that is explained by weight. A value of 0.86 suggests that weight explains the variability in height. The closer R2 is to 1, the better the model fits the data