**PART A**

1. **How many total combinations are possible? Show the math along with the code.**

**Explanation:**

Formula to calculate total combinations possible: (Number of faces)^(Number of Dice)

In the given problem Number of faces = 6 and the Number of Dice = 2. so, 6^2 = 36.I have used Python programming to code the given problem. Firstly initialize an empty dictionary sum\_count to keep track of the count of each possible sum of two dice. Then initialize an empty list of combinations to store all possible combinations of two dice rolls. Next, I used nested loops to iterate over all possible outcomes of two dice rolls in which the outer loop represents the result of the first die, and the inner loop represents the result of the second die. For each combination, I have created a list containing the outcomes of both dice and append it to the combinations list. Finally, Update the sum\_count dictionary to keep track of the occurrences of each possible sum. If the sum is not already a key in the dictionary, add it with a count of 1. If it's already a key, increment the count.

**Code:**

faces = [1, 2, 3, 4, 5, 6]

total = len(faces) \*\* 2

print("Total Combinations:", total)

sum\_count={}

combinations = []

for i in range(1,7):

for j in range(1,7):

combinations.append(["Die A:" + str(i) ,"Die B:"+str(j)])

if i+j not in sum\_count:

sum\_count[i+j]=1

else:

sum\_count[i+j]+=1

**Output:**

