**Approach Details**

**Part-A-1:**

**Approach:**

The approach is to return the value of the number of sides in each die raised to the power of the number of dice rolled as the possible combinations.

**Reason for choosing it:**

To decrease the time complexity to O(1) I have chosen this mathematical approach instead of the brute force approach that results in a complexity of n raised to the power of 2.

**Part-A-2:**

**Approach:**

The approach used here is to run two for loops each indicating a die being thrown and displaying the distribution of all possible combinations along with its sum.

**Reason for choosing it:**

It is a simple but yet an efficient approach known and results in a time complexity of n raised to the power of 2 to accomplish the intended task.

**Part-A-3:**

**Approach:**

The approach used here is to use a dictionary for storing the frequency of each possible sum occurring. Then it is used for the purpose of calculating the probability of all possible sums occurring. This is then displayed.

**Reason for choosing it:**

Using a dictionary is a comfortable way to gather frequencies and for calculating and displaying the probability of each possible sum occurring. It also results in a time complexity of n raised to the power of 2, yet it is an optimal and efficient approach to solve the intended task.

**Part-B:**

**Approach:**

The approach applied is nothing but calculating the initial probability of the original dice and then as per conditions the die A is changed in a way that it only takes up values between 1<=A[i]<=4. Then according to the values of A, B is then assigned values recursively, thus implementing a backtracking approach to solve the problem. The recursion ends if the value for B with which the probability of all possible occurring sums is equivalent to its initial value (Before the dice gets changed).

**Reason for choosing it:**

Backtracking is the most suitable way for his kind of problem and that’s the reason I implemented it. The recursion is made simpler by considering the minimum and maximum value of the die B to be 1 and 8 respectively to match with the die A to have the same probability. Thus the subsequent recursive steps fill up values for the rest of the sides.