SECURIN CODING CHALLENGE

**Logic Explanation of the Problem Statement :**

**Part A:**

1.Total number of combinations:

There are two dices each having 6 faces in it.

So, The total combinations = 6\*6 = 36.

The combinations include:

{ {1,1} , {1,2} , {1,3} , {1,4} , {1,5} , {1,6} ,

{2,1} , {2,2} , {2,3} , {2,4} , {2,5} , {2,6} ,

{3,1} , {3,2} , {3,3} , {3,4} , {3,5} , {3,6} ,

{4,1} , {4,2} , {4,3} , {4,4} , {4,5} , {4,6} ,

{5,1} , {5,2} , {5,3} , {5,4} , {5,5} , {5,6} ,

{6,1} , {6,2} , {6,3} , {6,4} , {6,5} , {6,6} }

3.If the values on both the dices are summed up.

The matrix is:

|  |  |  |
| --- | --- | --- |
| Dice A / Dice B | 1 2 3 4 | 5 6 |
| 1 | 2 3 4 5 | 6 7 |
| 2 | 3 4 5 6 | 7 8 |
| 3 | 4 5 6 7 | 8 9 |
| 4 | 5 6 7 8 | 9 10 |
| 5 | 6 7 8 9 | 10 11 |
| 6 | 7 8 9 10 | 11 12 |

4. To calculate the probability of each sum occurring, we divide the number of combinations resulting in that sum by the total number of combinations.

For example :

we have calculated sum(11) for 2 times.To find the probability, we divide the occurrence of the sum by the total number of combinations.

P(x=11) = 2/36 = 0.05555556

5. The probabilities of the sums for the remaining combinations:

P(Sum = 12) = 0.0277778

P(Sum = 11) = 0.0555556

P(Sum = 10) = 0.0833333

P(Sum = 9) = 0.111111

P(Sum = 8) = 0.138889

P(Sum = 7) = 0.166667

P(Sum = 6) = 0.138889

P(Sum = 5) = 0.111111

P(Sum = 4) = 0.0833333

P(Sum = 3) = 0.0555556

P(Sum = 2) = 0.0277778

**Part B:**

Conditions for dooming the dice :

1. Each face value on dice A should not exceed 4 and same value can appear on many sides.
2. The face value on each side of dice B can exceed 6 if needed.

After dooming the dice, the sum of the probabilities should be the same as the probabilities previously obtained.

Using trial and error method,

1. Firstly, If die A has more than 4 dots , it has to be reduced to four or less number of dots.
2. The dots in dice B can remain unchanged as the condition won’t affect the dots on the dice.
3. Now, after the given condition is satisfied, the probabilities of sums is calculated like how we calculated in part A.
4. If the probabilities of sum obtained after placing the spots as per the condition has to match with the probability of sums before dooming.
5. Only if it matches, the spots on each face of die A and die B has to be displayed.