**THE DOOMED DICE CHALLENGE**

**SOLUTION**

**Part A**

Upon contemplating and reading the question,

**No. of Dices:** 2 (6 sided)

Values in dices range from 1 to 6

Thus,

Minimum combined sum = 1 + 1 = 2

Maximum combined sum = 6 + 6 = 12

Now for total combinations possible, since there are 2 six-sided dice, the combination would be 6\*6 (6 is the number of face values on given dice):

**Total = 6\*6 = 36**

2. If we look at the **Values distribution**:

S = {

(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)

}

[total of 36 combinations] or 6x6 matrix

Now going further, finding the possible sum for the above combinations

2, 3, 4, 5, 6, 7

3, 4, 5, 6, 7, 8

4, 5, 6, 7, 8, 9

5, 6, 7, 8, 9, 10

6, 7, 8, 9, 10, 11

7, 8, 9, 10, 11, 12

Formula for Probability,

**Probability = (No. of favorable outcomes / Total outcomes in sample space)**

For example

To find the probability of getting Sum = 2 when rolling both dice,

Now for getting **Sum value as 2**, the only possible dice outcome is

**Dice A = 1**

**Dice B = 1**

**Sum = 1+1 = 2**

P(Sum = 2) = (probability of getting 1 while rolling Dice A)\*(probability of getting 1 while rolling Dice B)

Now,

Probability of getting 1 in Dice A = (when outcome is 1/ total outcomes possible)

**P(1) = ⅙**

Similarly for Dice B also the probability of getting 1 is **⅙**

Thus, P(Sum = 2) = **⅙\*⅙ = 1/36 = 0.02777 = 2.77%**

Similarly finding all the probabilities we get,

P(Sum = 2): 0.027777777777777776 = 2.78

P(Sum = 3): 0.05555555555555555 = 5.56

P(Sum = 4): 0.08333333333333333 = 8.33

P(Sum = 5): 0.1111111111111111 = 11.11

P(Sum = 6): 0.1388888888888889 = 13.89

P(Sum = 7): 0.16666666666666666 = 16.67

P(Sum = 8): 0.1388888888888889 = 13.89

P(Sum = 9): 0.1111111111111111 = 11.11

P(Sum = 10): 0.08333333333333333 = 8.33

P(Sum = 11): 0.05555555555555555 = 5.56

P(Sum = 12): 0.027777777777777776 = 2.78

Logic for it is

Iterating through the range of starting from 2 to 12

* Finding combinations for each sum in the distribution
* Computing the probability value for that sum combination
* Printing the computed probability value