Assignment 1

AI1110: Probability and Random Variables
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Exemplar, 10.13.3.39:

Question.
A die has its six faces marked 0, 1, 1, 1, 6, 6. Two such dice are thrown together and the total score is recorded.
(i) How many different scores are possible?
(ii) What is the probability of getting a total of 7?

Answer:

i) 6
ii) $\frac{1}{3}$

Solution:
i) The possible sums are

- **0** (If both the times outcome is zero)
- **1** (If the outcome was 0 and 1 or viceversa)
- **2** (If both times the outcome was 1)
- **6** (If the outcome was 0 and 6 or viceversa
- **7** (If the outcome was 1 and 6 or viceversa
- **12** (If both times the outcome was 6)

$$\therefore \text{6 different scores are possible} \qquad (1)$$

ii)The sum 7 can be obtained only if

1	6

or

6	1

The total possible scores are 6 from equation (1)

$$\therefore \text{Required probability} = \frac{2}{6} = \frac{1}{3}$$

PMF of the distribution

x			
Outcome	0	1	6
P(X=x)	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

PMF of sum of numbers on the dice

x						
Score	0	1	2	6	7	12
P(X=x)	$\frac{1}{36}$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{9}$	$\frac{1}{3}$	$\frac{1}{9}$