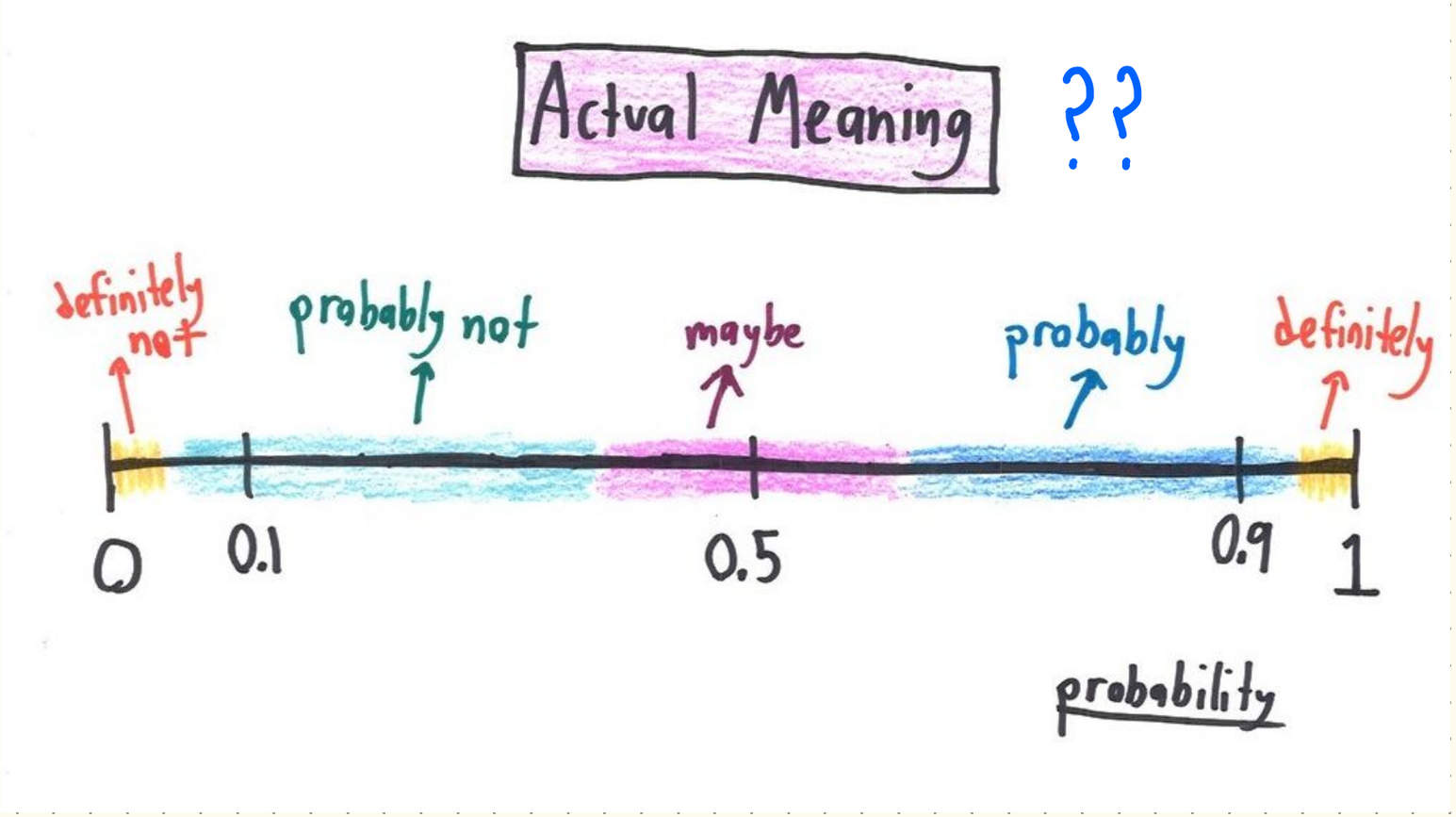
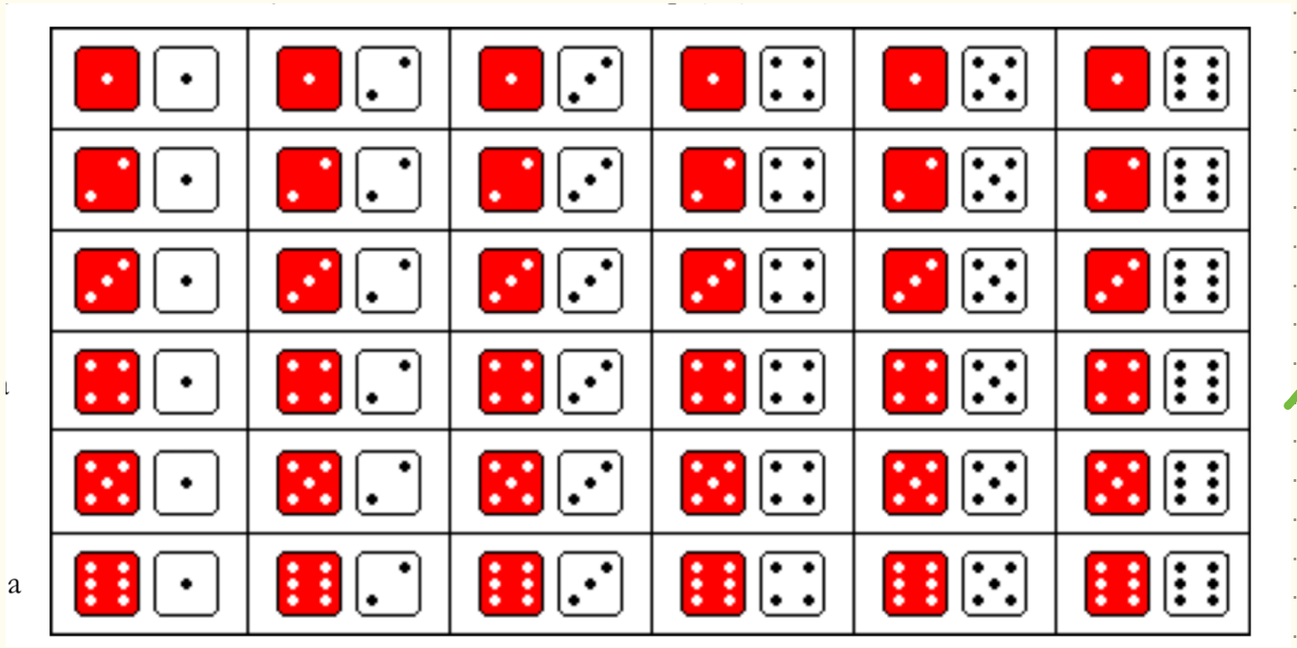
Math 3

Probability & Statistics

7 Sep 2022



1. What is the probability of an odd sum when two dice are thrown? (Ans. $\frac{1}{2}$)



total = 6×6 outcomes

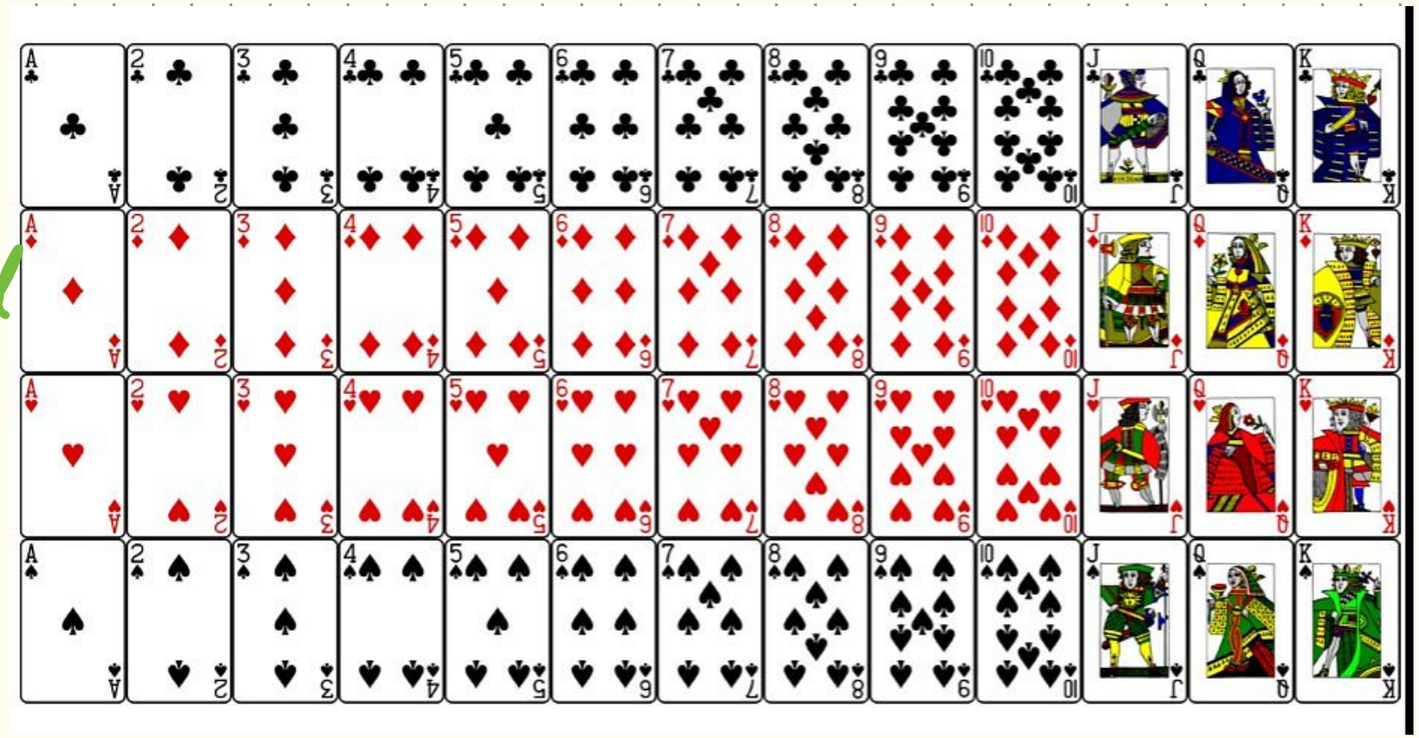
favorable = 18

E = odd sum

P(odd sum) = $\frac{\text{number of favorable outcomes}}{\text{total outcomes}}$

$P(E) = \frac{18}{36} = \frac{1}{2}$

2. Two cards are drawn from a well-shuffled pack. Find the probability that at least one of them is spade. (Ans. $\frac{15}{34}$)



club
diamond
heart
spade

2. Two cards are drawn from a well-shuffled pack. Find the probability that at least one of them is spade. (Ans. $\frac{15}{34}$)

E = at least one space

A_2 = one spade

A_3 = both are spades

$$P(E) = P(A_2) + P(A_3)$$

$$= \frac{{}^{13}C_1 \times {}^{39}C_1}{{}^{52}C_2} + \frac{{}^{13}C_2}{{}^{52}C_2} = \frac{15}{34}$$

3. Two urns contain respectively 3 white, 7 red, 15 black balls and 10 white, 6 red and 9 black balls. One ball is drawn from each urn. Find the probability that both the balls are of same colour. (Ans. $\frac{207}{625}$)

Event → drawing one ball from two urns

A → both are of same color

(W, W), (R, R), (B, B)

$$P(A) = \frac{3C_1 \cdot 10C_1}{25C_1 \cdot 25C_1} + \frac{7C_1 \cdot 6C_1}{25C_1 \cdot 25C_1} + \frac{15C_1 \cdot 9C_1}{25C_1 \cdot 25C_1} = \frac{207}{625}$$

4. The numbers $1, 2, \ldots, n$ $(n \geq 2,\ n \leq 9)$ are arranged in random order. What is the probability that the numbers 1 and 2 are always together? (Ans. $\frac{2}{n}$)