

1/18/18 p1

DISCRETE

DIE $S = \{1, 2, 3, 4, 5, 6\}$
↑
OUTCOMES

COIN: $\{H, T\}$

EVENTS: SUBSETS OF SAMPLE SPACE

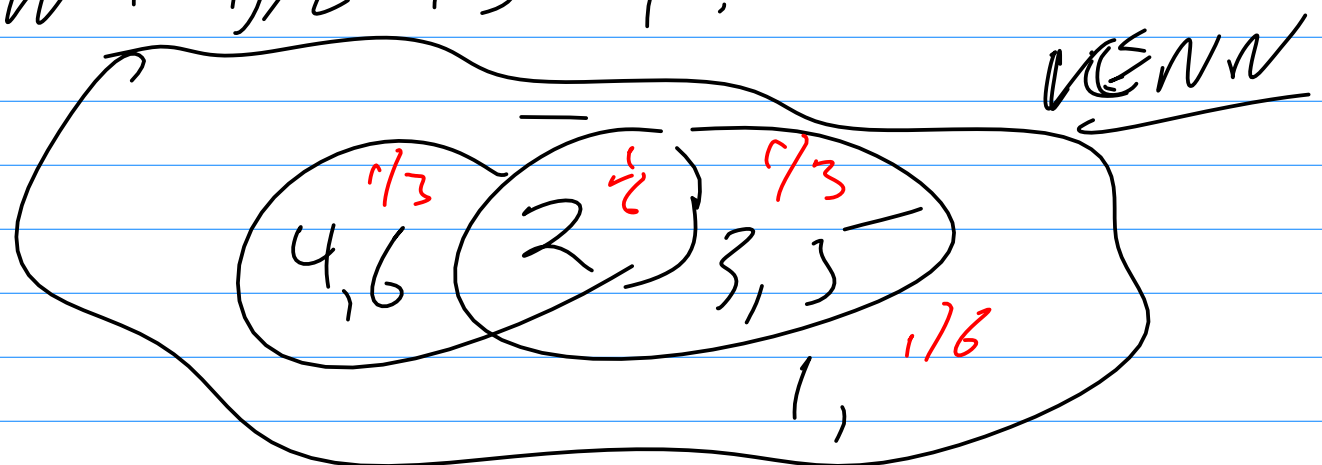
DIE IS EVEN

OUTCOMES: $2, 4, 6$

ANOTHER EVENT: DIE IS PRIME

OUTCOMES: $\{2, 3, 5\}$

EVENT: DIE IS 4.



TOSS COIN

(T, H, H, T, T, H, T, H, T, H)

~~HT~~ GT
~~HT~~ HT

~~DIE~~ $P(1) = \frac{1}{6}$ $P(2) = \frac{1}{6}$...

$$P(\text{OR } 2) = \frac{1}{6} + \frac{1}{6} = \frac{1}{3}$$

$$P(\text{EVEN}) = \frac{1}{2} \quad P(\text{PRIME}) = \frac{1}{2}$$

$$P(\text{EVEN OR PRIME}) = \frac{1}{2} + \frac{1}{2}$$

$$\frac{1}{6}$$

3

a_n : POSSIBLE OUTCOMES

$$0 \leq P(a_i) \leq 1$$

$$\sum P(a_n) = 1$$

DON'T OVERLAP

examples of probabilistic models

- machine learning
- targeted advertising
- college acceptance
- flu vaccine
- secure password choices
- weather prediction
- insurance premiums
- annuities
- blackjack
- lottery
- interest rates, financial derivatives

<https://wrf.ecse.rpi.edu/Teaching/probability-s2018/>

If you're satisfied with your grade in the first 2 exams, then you may skip the final.