

DATA 363: Checkpoint E1 E2E1-4(a) Heads = $\{H\}$

$$P\{\text{Heads}\} = \frac{\#(\text{Heads})}{\#(\text{Outcomes or Sample})} = \frac{1}{2}$$

(b) At least 2 H in a row = $\{HHT, THH, HHH\}$

$$P\{\text{At least 2 H in a row}\} = \frac{3}{8}$$

(c) Sum is 9 = $\{(3,6), (4,5), (5,4), (6,3)\}$

$$P\{\text{Sum is 9}\} = \frac{4}{36} = \frac{1}{9}$$

E1-13

Given $\frac{P(A)}{P(A^c)} = \frac{a}{b}$

Now, from the Complement Rule, we know that

$$P(\Omega) = P(A) + P(A^c) \\ = a + b$$

Now from the definition of $P(A)$, we can say

$$P(A) = \frac{\#A}{\#\Omega} = \frac{P(A)}{P(\Omega)} = \frac{a}{a+b}$$

E2-4The number of ways to draw 2 cards \Rightarrow

$$n(n-1) = 52 \times 51 = \boxed{2652 \text{ ways}}$$

Since there are 4 aces in a deck, the number of ways to draw 2 aces \Rightarrow

$$4 \times 3 = \boxed{12 \text{ ways}}$$