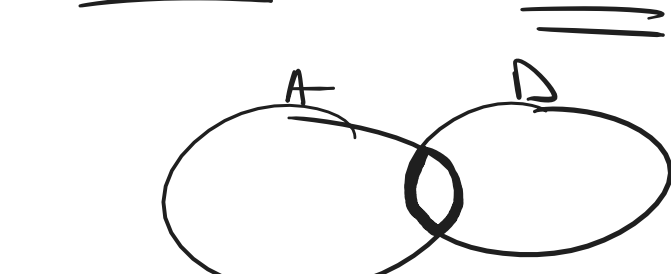
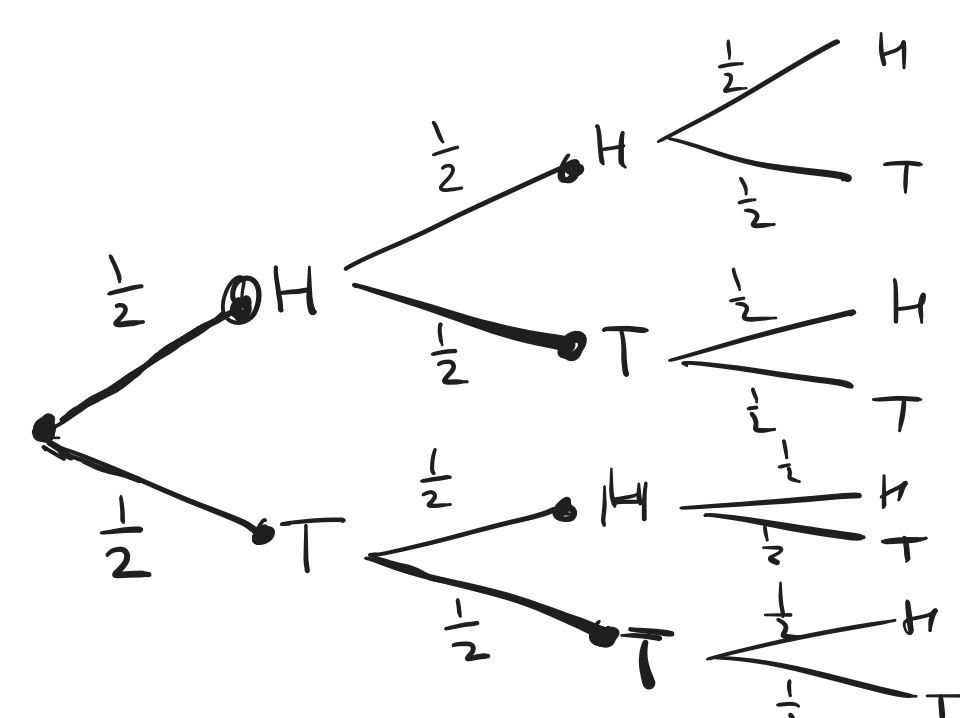


$A \cap D$
and - intersection



$A \cup D$
union - or



$$\Sigma = \{H, T\}$$

$$\frac{1}{2} + \frac{1}{2} = 1$$

$$\Sigma = \{1, 2, 3, 4, 5, 6\}$$

$$Pr(C) = \frac{1}{8} = Pr(C)$$

$$Pr(1) + Pr(2) + \dots + Pr(6) = \frac{1}{6} + \frac{1}{6} + \dots + \frac{1}{6} = 1$$

Pr between 0 and 1
0% 100%

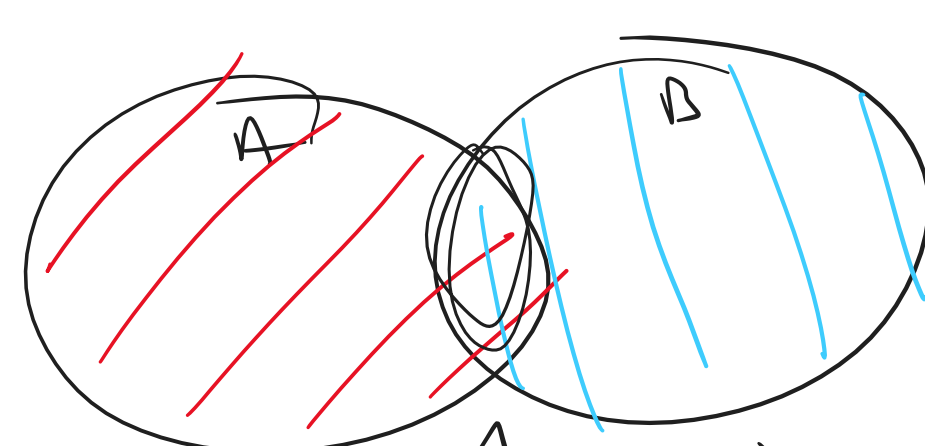
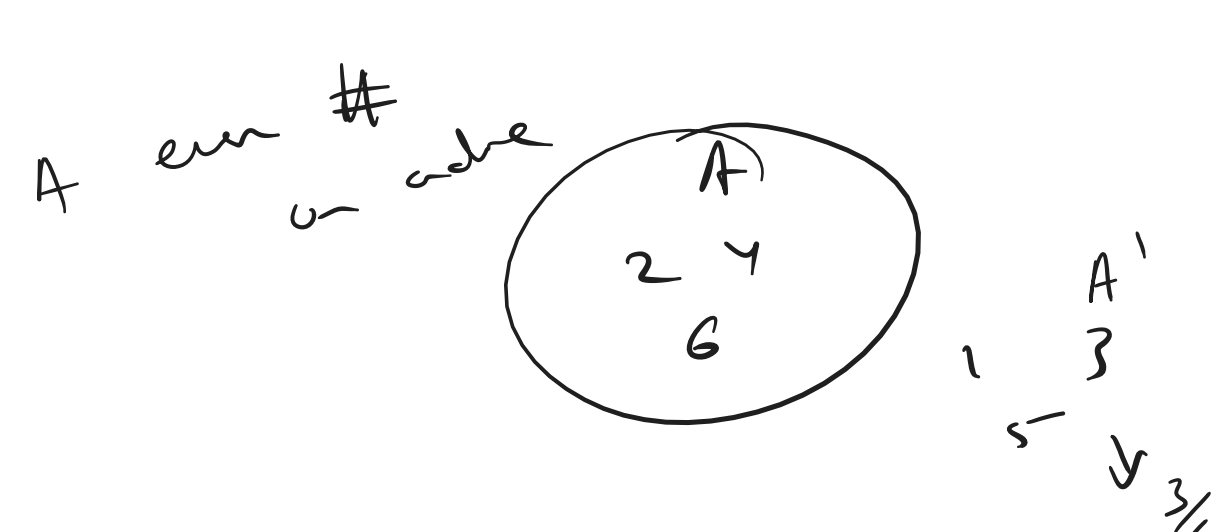
$$Pr(A') = 1 - Pr(A)$$

$$Pr(A) = \frac{2}{6} = \frac{1}{3}$$

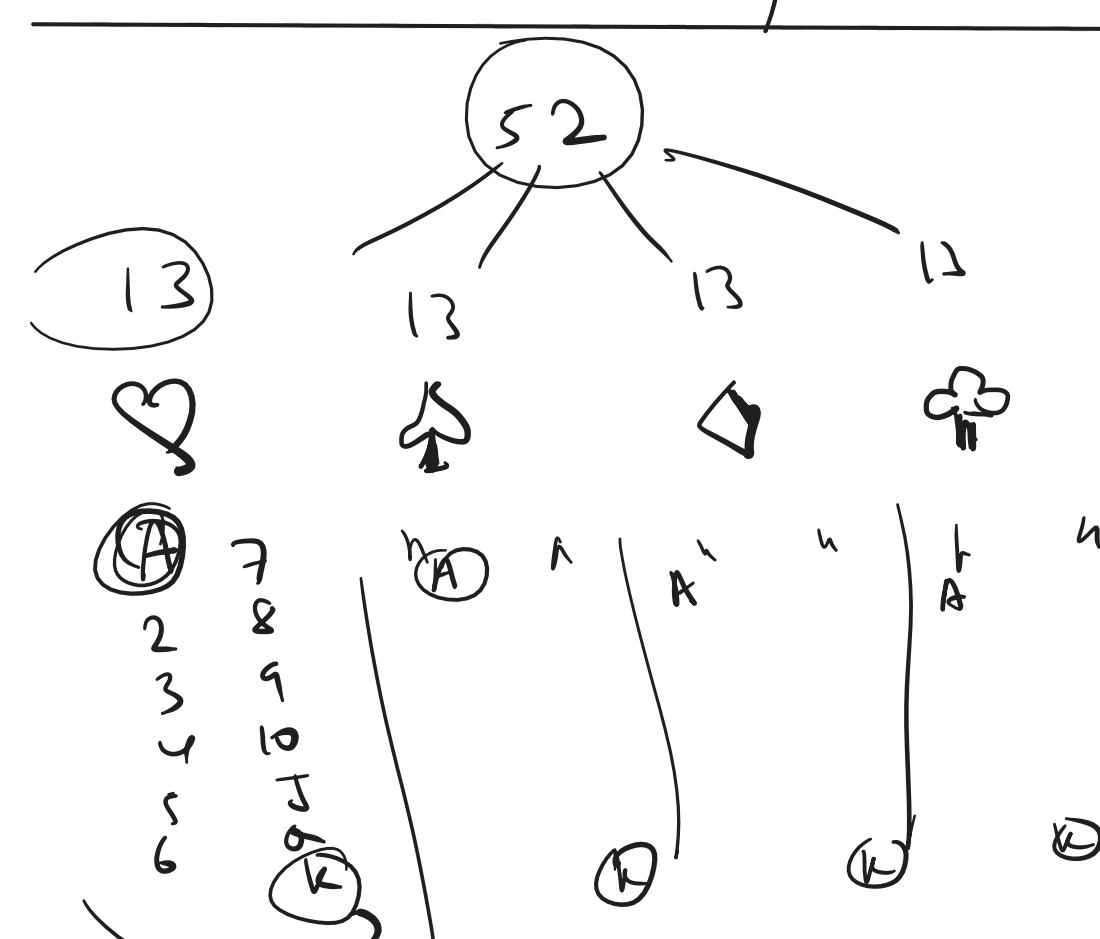
$$Pr(A') = 1 - Pr(A)$$

$$= 1 - \frac{1}{3}$$

$$= \frac{2}{3}$$



$$Pr(A \cup B) = Pr(A) + Pr(B) - Pr(A \cap B)$$



$$4/52$$

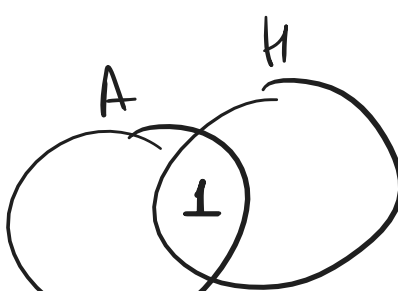
$$Pr(H') = 1 - Pr(H)$$

$$= 1 - \frac{1}{4}$$

$$= \frac{3}{4}$$

$$Pr(A \cup H) = Pr(A) + Pr(H) - Pr(A \cap H)$$

also include A's not mutually exclusive



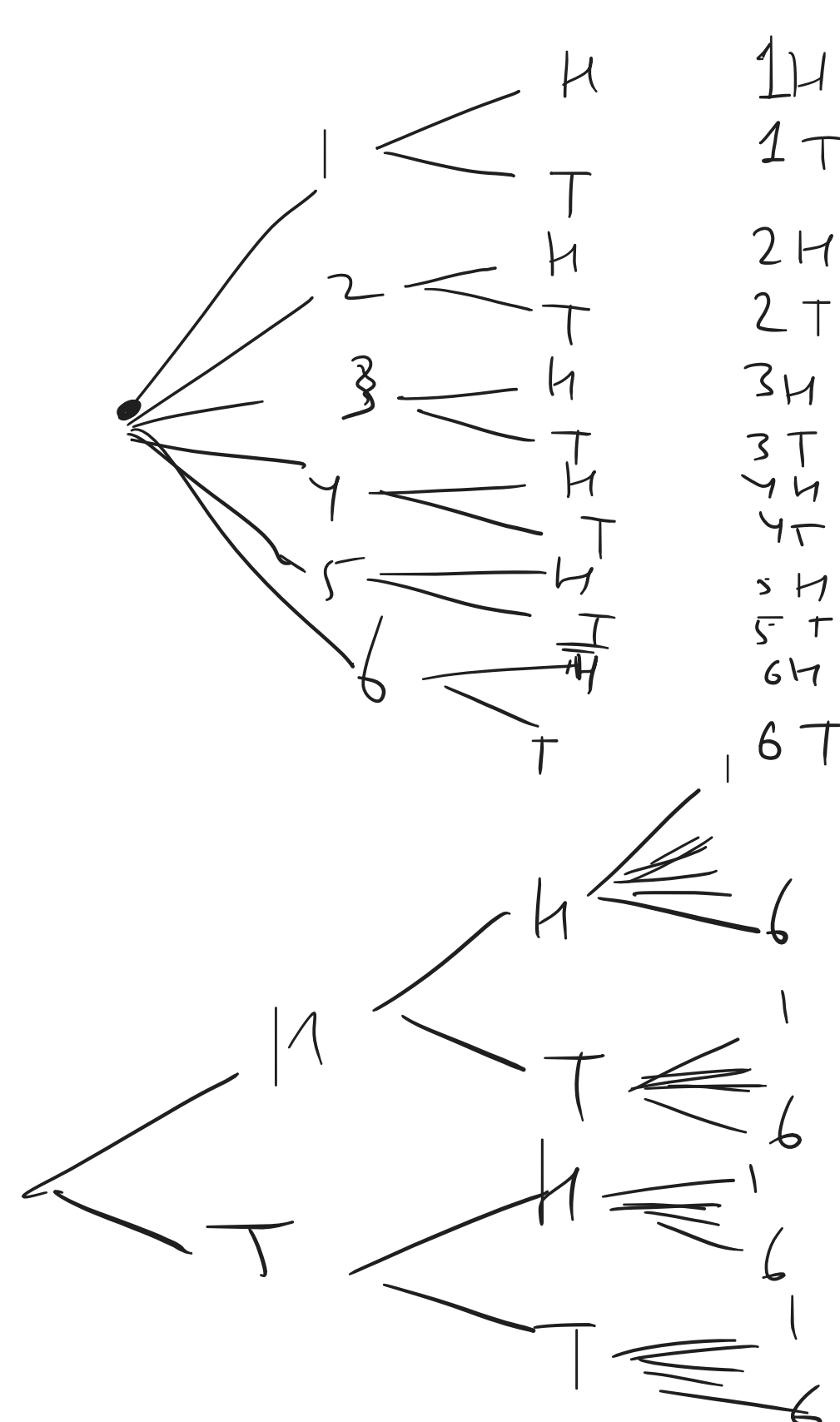
$$= \frac{1}{13} + \frac{1}{4} - \frac{1}{52}$$

$$= \frac{4}{13}$$

$$Pr(A \cup K) = Pr(A) + Pr(K) = \frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \frac{2}{13}$$

	F'	F	
C	0.05	0.3	0.35
C'	0.05	0.6	0.65
	0.1	0.9	1

- Example 1**
- 1 An experiment consists of rolling a die and tossing a coin. Use a tree diagram to list the sample space for the experiment.
 - 2 Two coins are tossed and a die is rolled. Use a tree diagram to show all the possible outcomes.
- Example 2**
- 3 If one card is chosen at random from a well-shuffled deck of 52 cards, what is the probability that the card is:
 - a queen
 - not a club
 - a queen or a heart
 - either a king or a queen?



$$\Sigma = \{1H, 1T, \dots, 6H, 6T\}$$

12 outcomes

$$HH 1$$

$$HT 1$$

$$TH 1$$

$$TT 1$$

$$HH 2$$

$$HT 2$$

$$TH 2$$

$$TT 2$$

$$HH 6$$

$$HT 6$$

$$TH 6$$

$$TT 6$$

- 3** If one card is chosen at random from a well-shuffled deck of 52 cards, what is the probability that the card is:

- a queen
- not a club
- a queen or a heart
- either a king or a queen?

$$a) Pr(\text{queen}) = \frac{13}{52} = \frac{1}{4}$$

$$b) Pr(\text{not a club}) = 1 - \frac{13}{52} = \frac{39}{52} = \frac{3}{4}$$

$$c) Pr(\text{queen or a heart}) = Pr(Q) + Pr(H) - Pr(Q \cap H) = \frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \frac{4}{13}$$

$$d) Pr(\text{king or a queen}) = Pr(K) + Pr(Q) - Pr(K \cap Q) = \frac{4}{52} + \frac{4}{52} - \frac{2}{52} = \frac{6}{52} = \frac{3}{26}$$

$U = \text{or}$

$\cap = \text{and}$



$$d) Pr(K \cup Q)$$

$$= Pr(K) + Pr(Q) - Pr(K \cap Q)$$

$$= \frac{4}{52} + \frac{4}{52}$$

$$= \frac{8}{52} = \frac{2}{13}$$

