

Flip three coins

- Flip three coins, and assume that each coin can come up H or T .
- The sample space is

$$\Omega = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}.$$

- If we assume that each outcome is equally likely, then since $|\Omega| = 8$, we have $p(\omega) = 1/8$ for all ω .
- Then probability of two heads is

$$\mathbb{P}(\{HHT, HTH, THH\}) = 3/8.$$

Ways the assumption could break

- What if coin is weighted so heads more likely than tails?
 - American quarter comes up heads about 50.2% of the time, FYI...
- What if the flips are not independent?
 - Extreme example: coins all taped together
 - Sample space is $\{HHH, TTT\}$
 - or same sample space but $p(HHT) = 0$, etc.