BECOME A MEMBER

ON STEADY

The Bright Side of Mathematics

Probability Theory – Part 4

Coin tossing: H, T

Probability for H: $p \in \mathbb{Q} \cap [0,1]$

$\rotatebox{90}{=}\ \frac{a}{a+b}, \quad a,b \in \{0,1,2,\dots\}$

(Fair coin: $p = \frac{1}{2}$)

a times H, b times T

Drawing a ball

Probability for H: $p = \frac{a}{a+b}$

In both cases: $\Omega = \{H, T\}, \quad \mathbb{P}(\{H\}) = \underbrace{\frac{a}{a+b}}_{p}, \quad \mathbb{P}(\{T\}) = \underbrace{\frac{b}{a+b}}_{1-p}$

Binomial distribution:

- n tosses of the same coin and counting the heads
- draw n balls with replacement and count the heads
- size n, unordered, with replacement

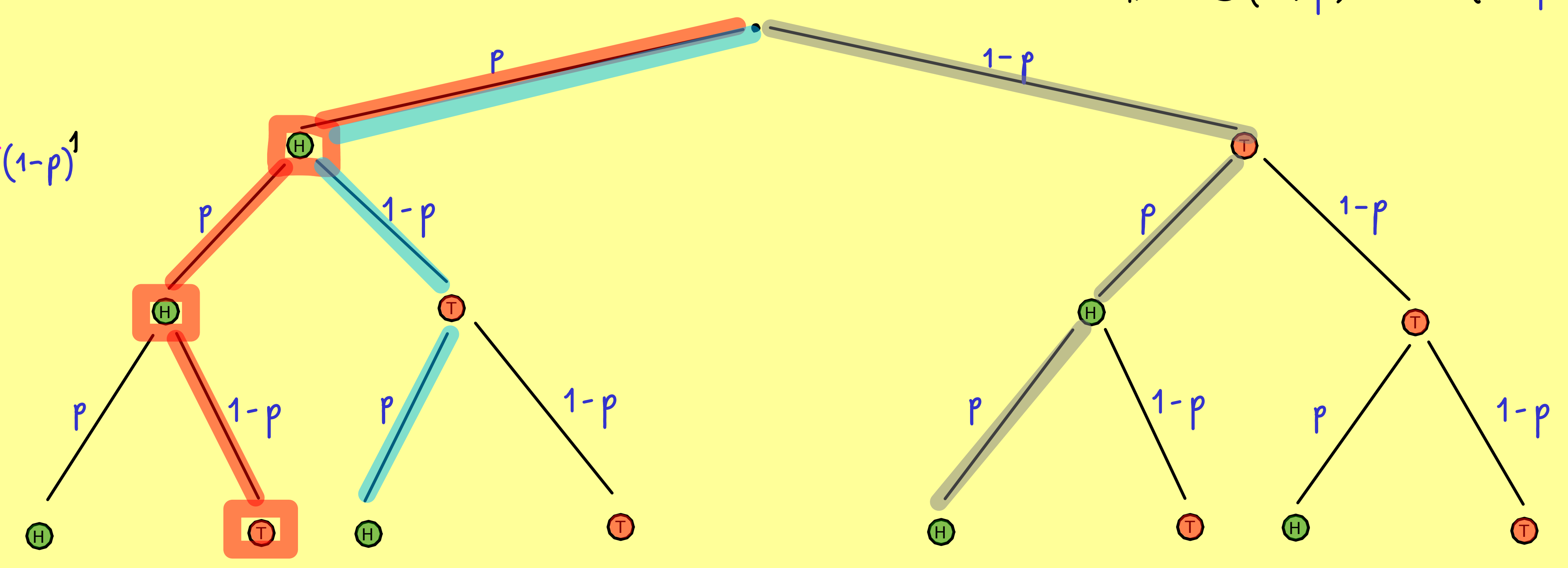
(no order!)

$\Omega = \{0,1,2,\dots,n\}, \quad \mathbb{P}(\{k\}) = \binom{n}{k} p^k (1-p)^{n-k}$

two parameters (n, p)

$\mathbb{P} = \mathcal{B}(n,p) = \mathcal{B}in(n,p)$

$\binom{3}{2} p^2 (1-p)^1$



In R: a times H, b times T