Sampling Distributions

Show the sampling simulation.

Unbiased Estimators:

$$E(\bar{x}) = \mu$$
$$E(s^2) = \sigma^2$$

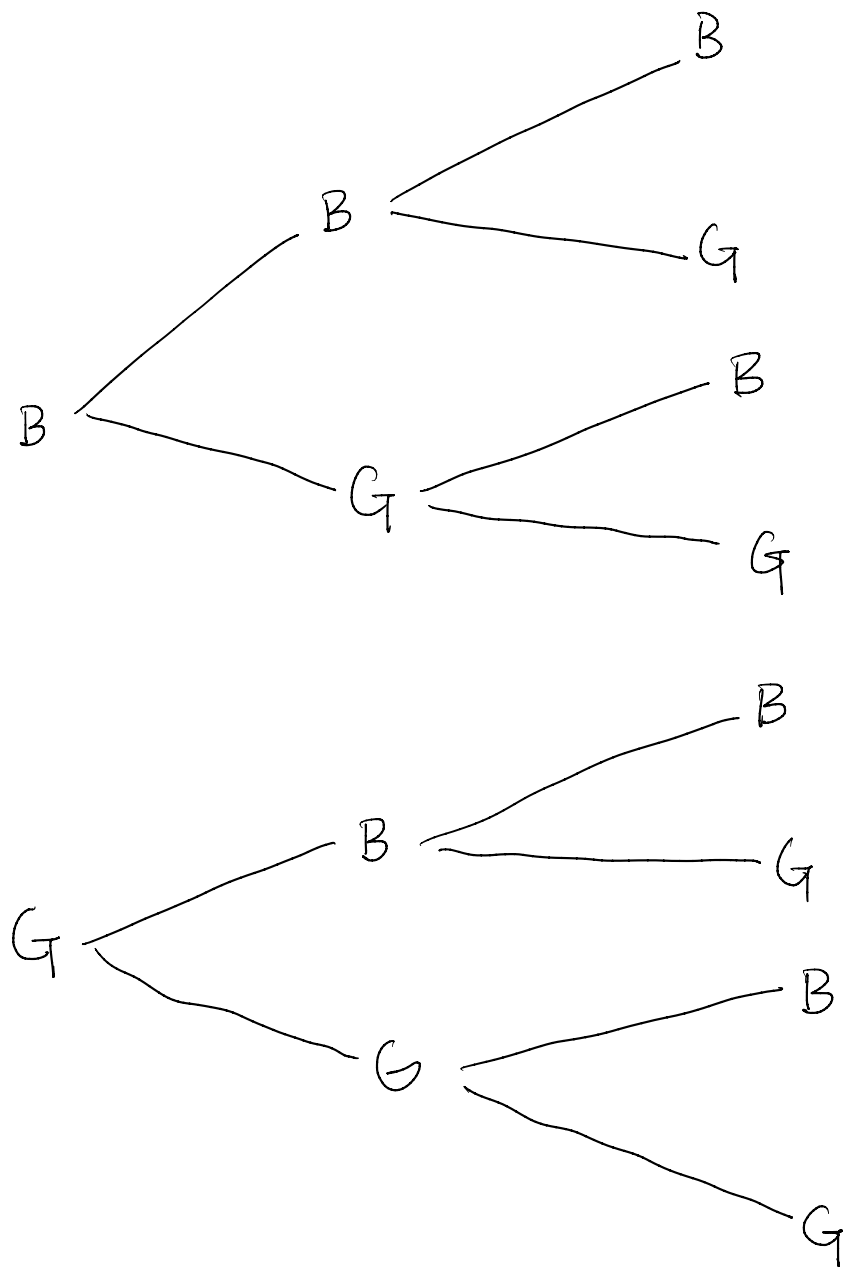
that means... {run the simulation}

We also have

$$V(\bar{x}) = \sigma^2/n$$

remember that from the exam?

Family of 3



Combinations	Probability
B B B	p^3
B B G	p^2q
B G B	p^2q
B G G	pq^2
G B B	p^2q
G B G	pq^2
G G B	pq^2
G G G	q^3

Let $p = pr\{\text{child } i = B\}$, $q = pr\{\text{child } i \neq B\}$

$\Pr\{1 \text{ Boy in family}\} = pq^2 + pq^2 + pq^2 = 2q^2$

$$\Pr\{1B\} = \binom{3}{1} pq^2 = \frac{3}{1!\,2!} = \frac{3 \cdot 2 \cdot 1}{2 \cdot 1 \cdot 1} = 3$$

$$\Pr\{X = k\} = \binom{n}{k} p^k q^{n-k}$$ were $\binom{n}{k}$ = "n choose k" = $\frac{n!}{(n-k)!\,k!}$

# of possible combinations to obtain outcome.

Binomial Distr must satisfy the following properties:

1. Fixed # of trials, n
2. Trials are independent and identically distributed (iid)
3. Binary/outcomes: Success and Failure
   Dichotomous
4. Fixed probability p.