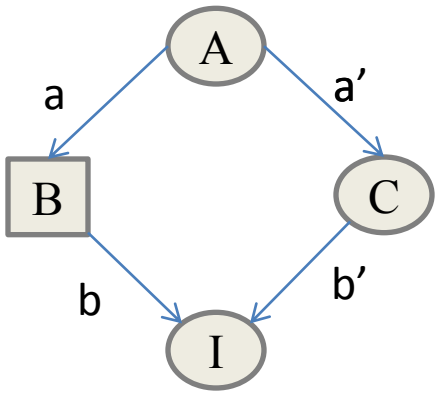
Mating of two half sibs



Probability that a = b is ½.
Probability that a = a' is ½.
Probability that a' = b' is ½.

Probability that b = b' are identical is the coefficient of kinship of B and C, or the inbreeding coefficient of I:

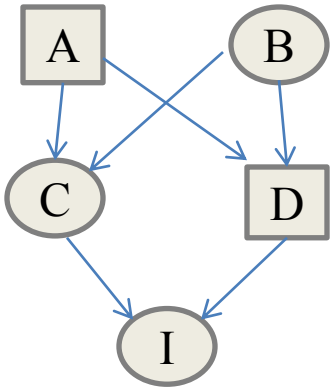
$f_I = ½ \times ½ \times ½ = 1/8$

Note: If we count steps backwards from one parent to the common ancestor, and back to the parent, we get 3.

If we compute $(½)^3$, we get $f_I = 1/8$. (Assumes that A is not inbred.)

This is path analysis.
Each possible path leading to every common ancestor traced separately.
The inbreeding coefficient is the sum of the possibilities obtained from every separate path.

Full sib mating:

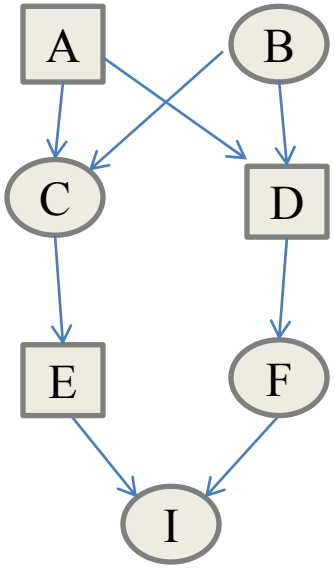


Path C<u>A</u>D: $(½)^3 = 1/8$

Path C<u>B</u>D: $(½)^3 = 1/8$

$f_I = ¼$

First cousin mating:

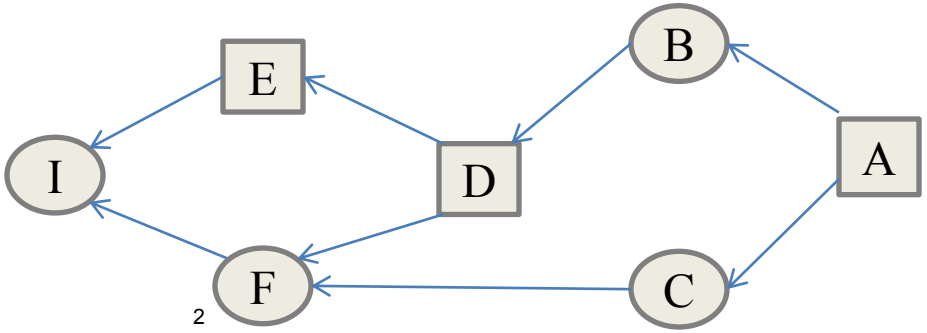


Path EC<u>A</u>DF: $(½)^5 = 1/32$

Path EC<u>B</u>DF: $(½)^5 = 1/32$

$f_I = 1/16$

Complex pedigree



Path E<u>D</u>F: $(½)^3 = 1/8$

Path EDB<u>A</u>CF: $(½)^3 = 1/64$

$f_I = 9/64$

9.20 Animal Behavior

Fall 2013