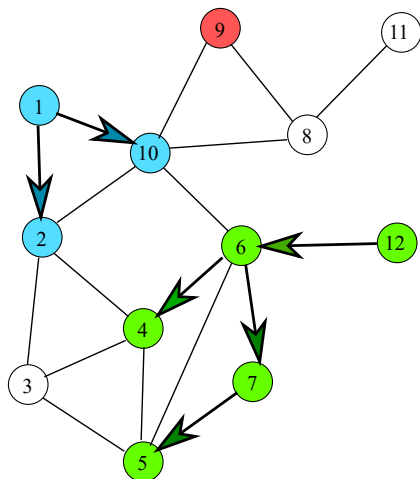


Estimator n_3

- (1) In this example, the (unknown) underlying graph is, as before:

$$|V| = 12$$

$$|E| = 18$$



Data on neighborhoods and ego network sizes
(only facts about the sample will be used)

$N(1)=\{2,10\}$	$d(1)=2$
$N(2)=\{1,3,4,10\}$	$d(2)=4$
$N(3)=\{2,4,5\}$	$d(3)=3$
$N(4)=\{2,3,5,6\}$	$d(4)=4$
$N(5)=\{3,4,6,7\}$	$d(5)=4$
$N(6)=\{4,5,7,10,12\}$	$d(6)=5$
$N(7)=\{5,6\}$	$d(7)=2$
$N(8)=\{9,10,11\}$	$d(8)=3$
$N(9)=\{8,10\}$	$d(9)=2$
$N(10)=\{1,2,6,8,9\}$	$d(10)=5$
$N(11)=\{8\}$	$d(11)=1$
$N(12)=\{6\}$	$d(12)=1$

- (2) Decide on sample size, e.g. $r=9$.

- (3) Obtain an RDS capture sample of the desired size:

$$\text{e.g. } S=\{1,2,10,4,5,6,7,12,9\}$$

from 3 seeds, e.g. 1, 12, 9. Compute the components

$$C_1=\{1,2,10\} \quad |C_1|=3$$

$$C_2=\{4,5,6,7,12\} \quad |C_2|=5$$

$$C_3=\{9\} \quad |C_3|=1$$

Compute complements of components and average ego net size for each:

$$\tilde{C}_1=\{4,5,6,7,12,9\} \quad d(\tilde{C}_1)=(4+4+5+2+1+2)/6=3$$

$$\tilde{C}_2=\{1,2,10,9\} \quad d(\tilde{C}_2)=(2+4+5+2)/4=3.25$$

$$\tilde{C}_3=\{1,2,10,4,5,6,7,12\} \quad d(\tilde{C}_3)=(2+4+5+4+4+5+2+1)/8=3.375$$

- (4) Compute second assay for each component:

$$R(C_1)=\{3,4,6,8,9\} \quad |R(C_1)|=5$$

$$R(C_2)=\{2,3,3,10\} \quad |R(C_2)|=4$$

$$R(C_3)=\{8,10\} \quad |R(C_3)|=2$$

- (5) Compute matches for each component:

$$X(C_1)=\{4,6,9\} \quad |R(C_1)|=3$$

$$X(C_2)=\{2,10\} \quad |R(C_2)|=2$$

$$X(C_3)=\{10\} \quad |R(C_3)|=1$$

- (6) Compute the harmonic mean of sample ego network sizes

$$d(S)=9/(0.5+0.25+0.2+0.25+0.25+0.2+0.5+1+0.5)=2.46$$

- (7) Compute telefunken estimate:

$$n_3 = \frac{(3-1)/2.46 * 3*5 + (3.25-1)/2.46 * 5*4 + (3.375-1)/2.46 * 1*2}{3+2+1} = \frac{32.42}{6} = 5.40$$