Jakub Stawinski 16314781 assignment 3 attempt 2
disregard attempt 1

Iteration 2

calculate num (a_1'):

num (a_1')
$\frac{1}{2} * \frac{1}{4}$
$= \frac{1}{8}$

num (a_2')
$\frac{1}{2} * \frac{1}{3}$
$= \frac{1}{4}$

for each a_n^2 calculate num (a_n^2):

num (a_1^2)
$\frac{1}{2} * \frac{1}{2}$
$= \frac{1}{4}$

num (a_2^2)
$\frac{1}{2} * \frac{1}{4}$
$= \frac{1}{8}$

$P(a_1' | o', s')$
$= \frac{\frac{1}{8}}{\frac{1}{8}+\frac{1}{4}}$
$= \frac{1}{3}$

$P(a_2' | o', s')$
$= \frac{\frac{1}{4}}{\frac{1}{8}+\frac{1}{4}}$
$= \frac{2}{3}$

$P(a_1^2 | o^2, s^2)$
$= \frac{\frac{1}{4}}{\frac{1}{4}+\frac{1}{8}}$
$= \frac{2}{3}$

$P(a_2^2 | o^2, s^2)$
$= \frac{\frac{1}{8}}{\frac{1}{4}+\frac{1}{8}}$
$= \frac{1}{3}$

	cat	gr	ho	fre
ca	$\frac{1}{3}$		$\frac{2}{3}+\frac{2}{3}=\frac{4}{3}$	$\frac{1}{3}$
ve	$\frac{2}{3}$		$\frac{1}{3}$	0
la	0		$\frac{1}{3}$	$\frac{2}{3}$

get new tr(OLS) by normalising column sums

	tr(OLS)	gr	ho	fre
ca		$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{3}$
ve		$\frac{2}{3}$	$\frac{1}{6}$	0
la		0	$\frac{1}{6}$	$\frac{2}{3}$

Jakub Stanisławski 16319781 assignment 3

Iteration 3

calculate num (a_1^1): $\frac{1}{3} * \frac{1}{6} = \frac{1}{18}$

num (a_2^1): $\frac{2}{3} * \frac{2}{3} = \frac{4}{9}$

Calculat num (a_1^2): $\frac{2}{3} * \frac{2}{3} = \frac{4}{9}$

num (a_2^2): $\frac{1}{3} * \frac{1}{6} = \frac{1}{18}$

$P(a_1^1 | o^1, s^1) = \frac{\frac{1}{18}}{\frac{1}{18} + \frac{4}{9}} = \frac{1}{9}$

$P(a_2^1 | o^1, s^1) = \frac{\frac{4}{9}}{\frac{1}{18} + \frac{4}{9}} = \frac{8}{9}$

$P(a_1^2 | o^2, s^2) = \frac{\frac{4}{9}}{\frac{4}{9} + \frac{1}{18}} = \frac{8}{9}$

$P(a_2^2 | o^2, s^2) = \frac{\frac{1}{18}}{\frac{1}{18} + \frac{4}{9}} = \frac{1}{9}$

cnt	gr	ho	the
ca	$\frac{1}{9}$	$\frac{16}{9}$	$\frac{1}{9}$
ve	$\frac{8}{9}$	$\frac{1}{9}$	0
la	0	$\frac{1}{9}$	$\frac{8}{9}$

normalise (dum sums to get $h(o|s)$)

$h(o\|s)$	gr	ho	the
ca	$\frac{1}{9}$	$\frac{8}{9}$	$\frac{1}{9}$
ve	$\frac{8}{9}$	$\frac{1}{18}$	0
la	0	$\frac{1}{18}$	$\frac{8}{9}$