Daniel Pham
260 526 252

Artificial Intelligence
Homework #4

Question 1: Learning Bayes Net parameters

(a)

Probability of finding mosquitoes in the surroundings.

- P(M) = 0.24

Prob of diagnosing zika given that there are mosquitoes.

- P(Z | M) = 0.48

Prob of zika if no mosquitoes.

- P(Z | !M) = 0

Prob of fever symptoms given a zika diagnosis.

- P(F | Z) = 0.55

Prob of fever symptoms given no zika diagnosis.

- P(F | !Z) = 0.09

Prob of rash symptoms given a zika diagnosis.

- P(R | Z) = 0.41

Prob of rash symptoms given no zika diagnosis.

- P(R | !Z) = 0.24

(b)

i. Weights
$w_{M1=0}$ = , $w_{M1=1}$, $w_{Z2=0}$, $w_{Z2=1}$.
ii.
iii.

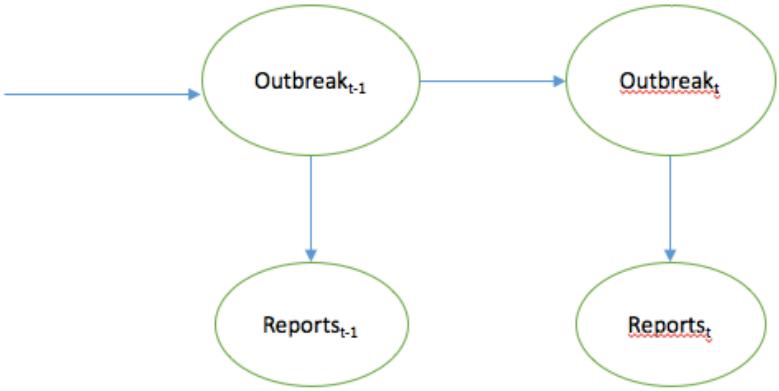
(c)

i. Bernoulli variable
   - P(F | Z) = 0.50
   - P(F | !Z) = 0.33
ii. Uniform distribution
   - A
iii. Gaussian distribution
   - A

Question 2: Hidden Markov Models

(a) Model

O_{t-1}	$P(O_t)$
True	0.8
False	0.2



O_t	$P(R_t)$
True	0.9
False	0.3

(b) {No, No, Yes}

	1	2	3
p	0.015		
a			

Fill in first column:
$P(N \mid S_t = p) * P(S_t = p) = 0.3 * 0.05 = 0.015$

Fill in second column:
$P(N \mid S_2 = p) (P(S_2 = p \mid S_1 = p) * a_{p,1} + P(S_2 = p \mid S_1 = a) * a_{a,1}) =$

(c) Probability of sequence and outbreak

(d)