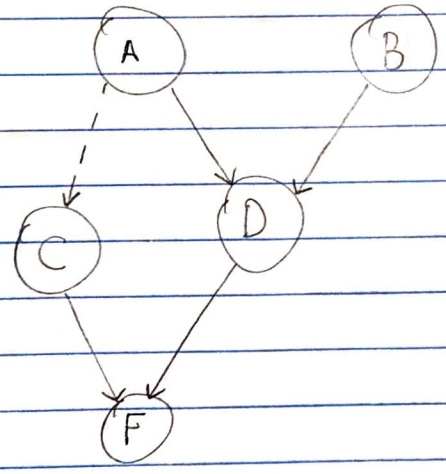
CS161 HW 6

1a) A independent of B & E
B independent of A & C
C ... B, D & E given A
D; C & E; A, B
E; A, C, D, F & G; B
F; A, B, E; C & D
G; A, B, C, D, F & H; F
H; A, B, C, D & G; E & F

1b)



1c) $Pr(A, B, C, D, E, F, G, H)$
$= Pr(A) * Pr(B) * Pr(C|A) * Pr(D|A,B) * Pr(E|B) * Pr(F|C,D)$
$* Pr(G|F) * Pr(H|E,F)$

1g) $Pr(A, \neg B, C, D, \neg E, F, \neg G, H) =$
$= 0.2 \times 0.3 \times Pr(c|a) * 0.6 * 0.1 * Pr(F|C,D) * Pr(\neg G|F)$
$* Pr(H|\neg E, F)$

1h) $Pr(\neg a, b) = Pr(\neg a) * P(b) = 0.8 * .7 = 0.56$

1i) $Pr(\neg e|a) = \frac{[Pr(\neg e, b) + Pr(\neg e, \neg b)] Pr(a)}{Pr(a)}$
$= .9 * .7 + .1 * .3 = 0.66$

2 i) $\forall x \; Food(x) \Rightarrow Likes(John, x)$

2 ii) $Food(Apples)$

2 iii) $Food(chicken)$

2 iv) $\exists x \forall y \; (Eats(x,y) \wedge \neg Sickens(y,x) \Rightarrow Food(y))$

2 v) $\forall x \exists y \; Sickens(y,x) \Rightarrow \neg Well(x)$

2 vi) $Eats(Bill, Peanuts) \wedge Well(Bill)$

2 vii) $\forall x \; Eats(Bill, x) \Rightarrow Eats(Sue, x)$