Matt Roy
CS5100
12/3/2014
Homework 3

1A
$f(x) = (x_1^2, x_1, x_2, x_2^2)$
$f(z) = (z_1^2, z_1, z_2, z_2^2)$
$k(x,z) = (x_1^2 z_1^2 + x_1 z_1 + x_2 z_2 + x_2^2 z_2^2)$

1B
$f(x) = (x^t, x_1 x_2)$

2A
$p(d) = p(a)p(b|a)p(d|b)$
$p(c) = p(a)p(b|a)p(c|b)$
$p(c|d) = p(c,d)p(d) = p(a)p(b|a)p(d|b)p(a)p(b|a)p(c|b)$

3A.
(1,1,0,-1) (2,0,1,1) = 2+0+0+-1 = 1
(1,1,0,-1)(-1,0,1,1) = -1+0+0+-1 = 0

3B.
(1,1,0,-1)(0,0,0,-1) = 0+0+0+1 = 1 != -1
(1,1,0,-1) + 0.1(1)(0,0,0,-1) = (1,1,0,-1.1)

4.

5.
$P_{ml}(F_1|Y') = 4/5$
$P_{ls}(F_1|Y') = 5/6$