Roll no - 1610991934
Name : Vaibhav Sharma
Assignment 3

Q2 # E_1, P(choosing bag 1) = 1/2
E_2, P(Choosing bag 2) = 1/2
A/E_1, (drawing Black ball from bag 1) = 6/10 = 3/5
A/E_2 (drawing Black ball from bag 2) = 3/7

using Bayes theorem,

E_1/A, P (drawing black ball, bag 1) $= \frac{P(E_1)\,P(A/E_1)}{P(E_2)P(A/E_2)+P(E_1)\,P(A/E_1)}$

$$P(E_1/A) = \frac{1/2 \times 3/5}{1/2 \times 3/7 + 1/2 \times 3/5} = \frac{3/10}{3/14 + 3/10} = \frac{0.3}{0.2142 + 0.3}$$

$$P(E_1/A) = 0.583$$

Q3 # E_1, P (Man Speaks Truth) = 2/3
E_2, P(Man Speaks lie) = 1 - 2/3 = 1/3
A/E_1, P (for when he speaks truth) = 1/6
A/E_2, P (for when he speaks lie) = 5/6

Using Bayes theorem

E_1/A, P (Number is actually four) $= \frac{P(E_1)\,P(A/E_1)}{P(E_2)P(A/E_2)+P(E_1)\,P(A/E_1)}$

$$P(E_1/A) = \frac{2/3 \times 1/6}{1/3 \times 5/6 + 2/3 \times 1/6} = \frac{2/18}{5/18 + 2/18} = 2/7$$

$$P(E_1/A) = 0.285714$$