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Assignmant - 3

Q2.) #E_1, P(choosing Bag 1) = $\frac{1}{2}$
   #E_2, P(choosing Bag 2) = $\frac{1}{2}$
   # A/E_1, P(drawing Black ball from Bag 1) = $\frac{6}{10}$ = $\frac{3}{5}$
   #A/E_2, P(drawing Black ball from Bag 2) = $\frac{3}{7}$

   Using Baye's theorem,

   # E_1/A, P(drawing Black ball, Bag 1) = $\dfrac{P(E_1)\, P(A/E_1)}{P(E_2)\, P(A/E_2) + P(E_1)\, P(A/E_1)}$

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

   $= \dfrac{3/10}{\frac{3}{14} + \frac{3}{10}}$ $= \dfrac{0.3}{0.2142 + 0.3}$

   $P(E_1/A) = \underline{\underline{0.583}}$

Q3.)
   # E_1, P(Man Speaks Truth) = $\frac{2}{3}$
   # E_2, P(Man Speaks Lie) = $1 - \frac{2}{3}$ = $\frac{1}{3}$
   # A/E_1, P(four when he speak truth) = $\frac{1}{6}$
   #A/E_2, P(four when he speaks lie) = $\frac{5}{6}$

   using Baye's theorem,

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

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

   $= \dfrac{2/18}{\frac{5}{18} + \frac{2}{18}}$ $= \frac{2}{7}$

   $P(E_1/A) = \underline{\underline{0.285714}}$