Week 4: Assignment Solutions

Question No. 1: (B)

Question No. 2: (B)

Hints: $p(A|\neg B) = \frac{p(\neg B|A) * p(A)}{p(\neg B)} = \frac{p(\neg B|A) * p(A)}{p(\neg B|A) * p(A) + p(\neg B|\neg A) * p(\neg A)} = \frac{0.6 * 0.3}{0.6 * 0.3 + 0.7 * 0.4} = 0.39$

Question No. 3: (B)

Question No. 4: (B)

Hints: Joint probability $= 0.8 * 0.05 = 0.04$

Question No. 5: (A)

Hints: Probability of A's throwing 6 with 2 dices $= \frac{5}{36}$

Probability of B's throwing 7 with 2 dices $= \frac{1}{6}$

A can win if he throws 6 in the first, third, fifth, seventh,... throws. Chances of A's wining$= \frac{5}{36} + \frac{31}{36} * \frac{5}{6} * \frac{5}{36} + \frac{31}{36} * \frac{5}{6} * \frac{31}{36} * \frac{5}{6} * \frac{5}{36} + ... = \frac{30}{31}$

Question No. 6: (A)

Hints: Let A: attributes, M: mammals and N: non-mammals

Using Naive Bayes Classifier and using independence among attributes we get:

$p(A|M) = \frac{6}{7} * \frac{6}{7} * \frac{2}{7} * \frac{2}{7} = 0.06$

$p(A|N) = \frac{1}{13} * \frac{10}{13} * \frac{3}{13} * \frac{4}{13} = 0.0042$

$p(A|M) * p(M) = 0.06 * \frac{7}{20} = 0.021$

$p(A|N) * p(N) = 0.004 * \frac{13}{20} = 0.0027$

As $p(A|M) * p(M) > p(A|N) * p(N)$ so it will be Mammal.

Question No. 7: (D)

Hints: $p(D) = p(D|A,B) * p(A) * p(B) + p(D|A,\neg B) * p(A) * p(\neg B)$
$+p(D|\neg A,B) * p(\neg A) * p(B) + p(D|\neg A,\neg B) * p(\neg A) * p(\neg B)$
Now put the conditional probability values in the equation and get the result.

Question No. 8: (B)

Hints: Ram can not solve the problem with probability $p(R) = \frac{2}{3}$

Rahim can not solve the problem with probability $p(RH) = \frac{3}{4}$

Nusrat can not solve the problem with probability $p(N) = \frac{1}{2}$

Probability that problem will be solved= $1 - \frac{2}{3} * \frac{3}{4} * \frac{1}{2} = \frac{3}{4}$