1111111111111111111111111111111111111111111111111111111111

National University of Computer & Emerging Sciences
Artificial Intelligence (CS401)
Quiz#6

Dated: April 24, 2014 Marks: 20
Time: 20 min. Std-ID: _____

Question No. 1

Mr. Ali is shifted to a new house. He came to know that his neighbor has 2 children. Once he saw Omar his neighbor's son. What is the probability that Omar's sibling is a brother?

Consider the experiment of selecting a random family having two children. The sample space is S = {BB,BG,GB,GG}, where, e.g., outcome "BG" means that the first-born child is a boy and the second-born is a girl. Assuming boys and girls are equally likely to be born, the 4 elements of S are equally likely. The event, E, that the neighbor has a son is the set E = {BB,BG,GB}.The event, F, that the neighbor has two boys (i.e., Omar has a brother) is the set F = {BB}. We want to compute

$P(F|E) = P(F \cap E)/ P(E) = P(\{BB\}) / P(\{BB,BG,GB\}) = (1/4) / (3/4) = 1 / 3$

Question No. 2

There are two lotteries selling counters, let X be the number of customers present at first counter at any time of the day, and Y be the number of customers present at the second counter at the same time. As X and Y both can be random processes their joint probability can be represented as below:

X / Y	0	1	2	3
0	0.08	0.07	0.04	0.00
1	0.06	0.15	0.05	0.04
2	0.05	0.04	0.10	0.06
3	0.00	0.03	0.04	0.07
4	0.00	0.01	0.05	0.06

a. What is the probability that there is one customer at both the counters?

P(X=1 and Y=1)=0.15

b. What is the probability that the numbers of customer at both counters are identical in number?
P(X==Y)=.08+.15+.10+.07=.40

22222222222222222222222222222222222222222222222222

National University of Computer & Emerging Sciences
Artificial Intelligence (CS401)
Quiz#6

Dated: April 24, 2014 Marks: 20
Time: 20 min. Std-ID: _____

Question No. 1

Mr. Ali is shifted to a new house. He came to know that his neighbor has 2 children. Once he saw Omar his neighbor's son. What is the probability that Omar's sibling is a sister?

Consider the experiment of selecting a random family having two children. The sample space is S = {BB,BG,GB,GG}, where, e.g., outcome "BG" means that the first-born child is a boy and the second-born is a girl. Assuming boys and girls are equally likely to be born, the 4 elements of S are equally likely. The event, E, that the neighbor has a son is the set E = {BB,BG,GB}.The event, F, that the neighbor has one boy and one girl (i.e., Omar has a sister) is the set F = {BG,GB}. We want to compute

$P(F|E) = P(F \cap E)/ P(E) = P(\{GB,BG\}) / P(\{BB,BG,GB\}) = (2/4) / (3/4) = 2 / 3$

Question No. 2

There are two lotteries selling counters, let X be the number of customers present at first counter at any time of the day, and Y be the number of customers present at the second counter at the same time. As X and Y both can be random processes their joint probability can be represented as below:

X / Y	0	1	2	3
0	0.08	0.07	0.04	0.00
1	0.06	0.15	0.05	0.04
2	0.05	0.04	0.10	0.06
3	0.00	0.03	0.04	0.07
4	0.00	0.01	0.05	0.06

a. What is the probability that there is no customer at both the counters?

   P(X=0 and Y=0)=.08

b. What is the probability that the numbers of customer at both counters are identical in number?

   P(X==Y)=0.40