HOMEWORK 5

SOLUTIONS

Assumptions:
Let G = Girl
Let B = Boy
Let P(G) = P(B) = ½
Therefore, P(GG) = P(GB) = P(BG) = P(BB) = ½ * ½ = ¼

According to Bayes' Theorem, the probability that both children are girls is:

$$P(GG|G) = \frac{P(G|GG) * P(GG)}{P(G)}$$

P(G|GG) means given 2 girls, what is the probability of having 1 girl. This is obviously 100%, or 1. Therefore we have:

$$P(GG|G) = \frac{(1) * \left(\frac{1}{4}\right)}{\frac{1}{2}} = \frac{\frac{1}{4}}{\frac{1}{2}} = \frac{1}{2}$$

Thus if we know a family has two children and see one of the children in the mall close to my house is a girl, we know that the probability of both children being girls is ½ or 50%.