1. At a certain stage of a criminal investigation the inspector in charge is 60 percent convinced of the guilt of a certain suspect. Suppose a new piece of evidence that shows that the criminal has a certain characteristic, such as left handedness, baldness, or brown hair is uncovered. If 20 percent of the population posseses this characteristic, how certain of the guilt of the suspect should the inspector now be if it turns out that the suspect has this characteristic?.

2. An insurance company belives that people can be divided into two classes: those who are accident prone and those who are not. Their staistics show that an accident-prone person will have an accident at some time within a fixed 1-year period with probability 0.4, whereas this probability decreases to 0.2 for non-accident-prone person. If we assume that 30 percent of the population is accident prone,

   (a) What is the probability that a new policyholder will have an accident within a year of purchasing a policy?

   (b) Suppose now that a new policyholder has an accident within a year of purchasing a policy. What is the probability that he or she is accident prone?

   (c) What is the conditional probability that a new policyholder will have an accident in his or her second year of policy ownership, given that the policyholder has had an accident in the first year?