1. A crime is committed by one of two suspects, A and B. Initially, there is equal evidence against both of them. In further investigation at the crime scene, it is found that the guilty party had a blood type found in 10% of the population. Suspect A does match this blood type, whereas the blood type of Suspect B is unknown. (a) Given this new information, what is the probability that A is the guilty party? (b) Given this new information, what is the probability that B’s blood type matches that found at the crime scene?

**Ans : Define events**

**A: {A is guilty}**

**B: {B is Guilty}**

**MA = {A's Blood matches the guilty party}**

**MB = {B's Blood matches the guilty party}**

**(a) we want to calculate P(A/MA) .Use Byes rule to Calculcate**

**P(A/MA) = P(MA|A)P(A)/P(MA|A)P(A)+P(MA|B)P(B)**

**(1.1/2)/(1.1/2)+(1/10\* 1/2) = 10/11**

**(b) we wan to calculate P(MB/MA). Use Lots to obtain**

**P(MB|MA) = P(MB|MA.A)P(A|MA)+P(MB/MB.A)P(B|MA)**

**= 1/10\*10/11 + 1.1/11 = 2/11**