Bayesian Examples

Printout of Excel file to calculate the Bayesian Probability for Time Path post

Monty Hall

1] You choose Door A **2]** Monty picks a different door **3]** Monty never picks door with prize

• MHB means Monty Hall opens door B … combine with [1] to single prior [1]

Initial values	P(A)	0.333333	**PdoorA**	prob prize behind A
	P(B)	0.333333	**PdoorB**	prob prize behind B
	P(c)	0.333333	**PdoorC**	prob prize behind C
	P(MHB | A)	0.5	**PMHBA**	Probability MH opens B when prize behind A You chose A. Goats are behind both B and C ... 50/50
	P(MHB | B)	0	**PMHBB**	Probability MH opens B when prize behind B Monty never opens door with prize
	P(MHB | C)	1	**PMHBC**	Probability MH opens B when prize behind C You chose A, Prize behind C, only choice is B

You chose A, MH shows goat behind B. What is chance that Prize is behind door C?

You want P(C | MHB) = P(MHB|C)*P(C)/Sum of all P(MHB| x)

P(C | MHB) =	0.666667	=PMHBC*PDoorC/(PMHBC*PDoorC+PMHBB*PDoorB+PMHBA*PDoorA)

$$\frac{P(MHB \mid C)\,P(C)}{P(MHB \mid C)\,P(C) + P(MHB \mid B)\,P(B) + P(MHB \mid A)\,P(A)}$$

Lie Detector

P(steal)	0.013	**Psteal**	Prior 1
P(honest)	0.987	**Phonest**	
P(Fail|Steal)	0.988	**Pfs**	Prior 2
P(Fail | honest)	0.23	**Pfh**	

P(steal|fail)	0.053549	=Pfs*Psteal/(Pfs*Psteal+Pfh*Phonest)

$$\frac{P(fail \mid steal)\,P(steal)}{P(fail \mid steal)\,P(steal) + P(fail \mid honest)\,P(honest)}$$