

Weeks 3, 4 Probability

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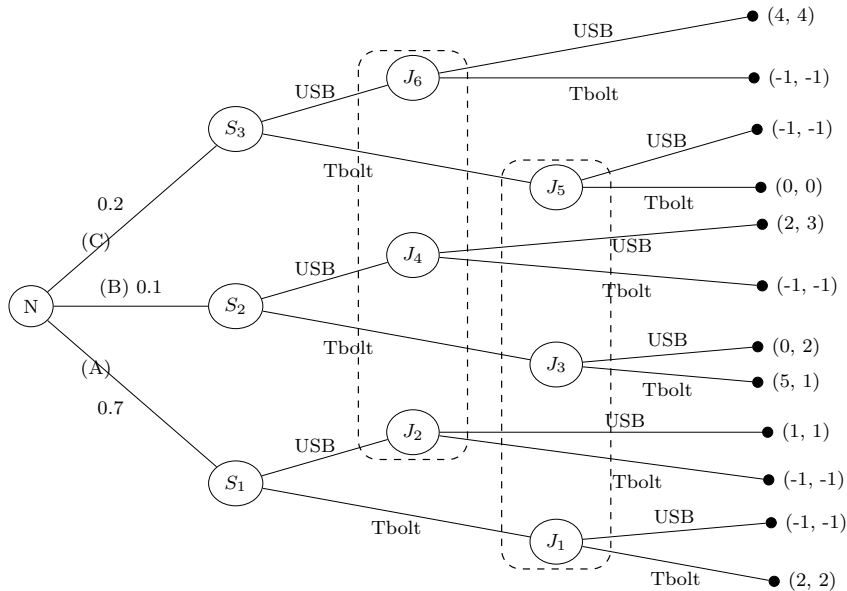
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Bayesian Terminology

Category	Meaning
Likelihood	$Prob(data event)$
Marginal probability	$Prob(data)$
Conditional probability	$Prob(data\ X data\ Y, event)$
Prior probability	$Prob(event)$
Posterior probability	$Prob(event data)$



Harsanyi Transformation



Probability Calculations

Prior belief

A 70%; B 10%; C 20%.

Derive probabilities

Marginal, conditional, and posterior probabilities depend on the strategy profile.



Strategy Profile I

Smith

A *Thunderbolt*

B *Thunderbolt*

C *USB*

Jones

Thunderbolt *Thunderbolt*

USB *USB*



Belief Updating

Likelihood	$Prob(T A)$	1
Marginal probability	$Prob(T)$	$P(T A)P(A) + P(T B)P(B) + P(T C)P(C) = 0.8$
Conditional probability	$Prob(U T, A)$	0
Posterior probability	$Prob(A T)$	$\frac{P(T A)P(A)}{P(T A)P(A) + P(T B)P(B) + P(T C)P(C)} = \frac{7}{8}$



Strategy Profile II (**Not Equilibrium**)

Smith

A T 40% U 60%

B T 30% U 70%

C T 100%

Jones

Thunderbolt T 50% U 50%

USB T 80% U 20%



Belief Updating

Likelihood	$Prob(T A)$
Marginal probability	$Prob(T)$
Conditional probability	$Prob(U T, A)$
Posterior probability	$Prob(A T)$



Vocabulary

likelihood

conditional probability

posterior probability

概率

条件概率

后验概率

marginal probability

prior probability

边际概率

先验概率



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