HW 24.1

Thursday, November 19, 2020 1:08 PM

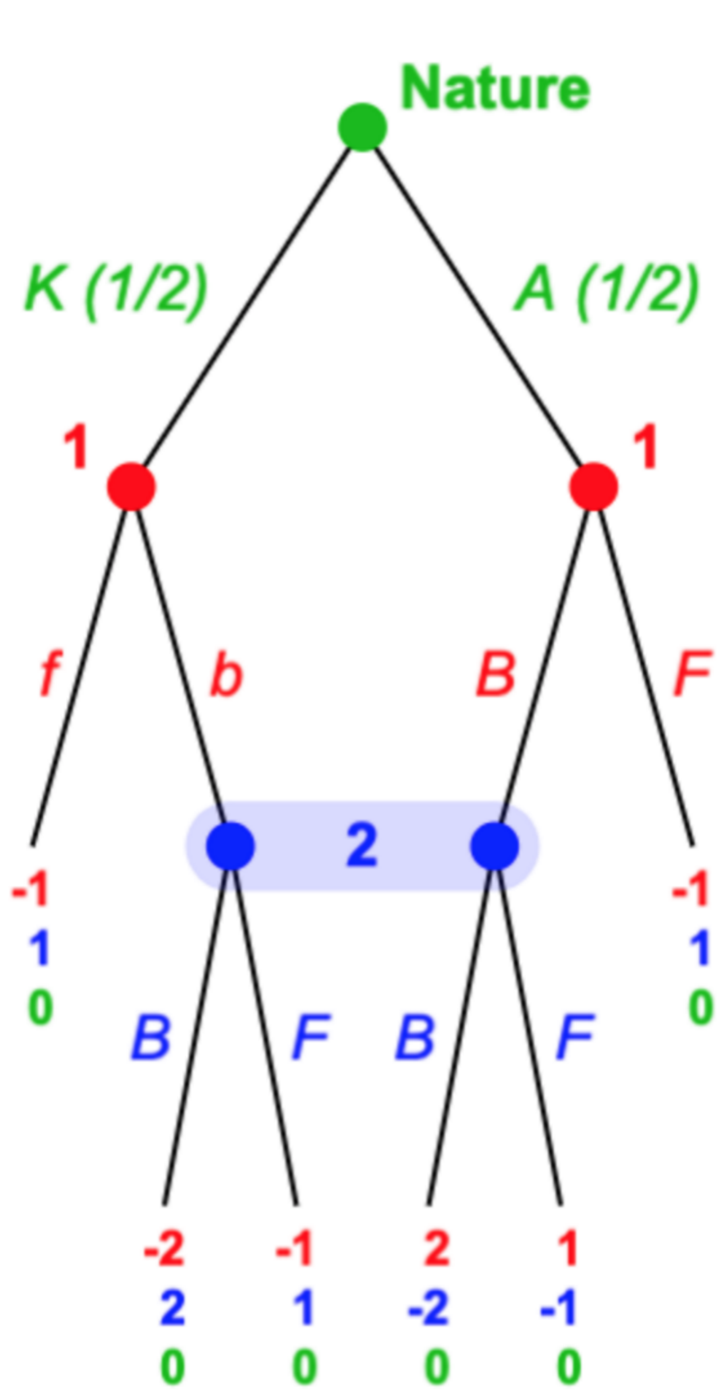
Passed solution review

1. Here is a description of the simplest poker game. There are two players and only two cards in the deck, an Ace (A) and a King (K). First, the deck is shuffled and one of the two cards is dealt to player 1. That is, nature chooses the card for player 1. It is the Ace with probability 1/2 and the King with probability 1/2. *Player 2 does not receive a card.*

Player 1 observes his card and then chooses whether to bid (B) or fold (F). If he folds, then the game ends with player 1 getting a payoff of -1 and player 2 getting a payoff of 1 (that is, player 1 loses his ante to player 2). If player 1 bids, then player 2 must decide whether to bid or fold. When player 2 makes this decision, she knows that player 1 bid, but she has not observed player 1's card. The game ends after player 2's action. If player 2 folds, then the payoff vector is $(1, -1)$, meaning player 1 gets 1 and player 2 gets -1.

If player 2 bids, then the payoff depends on player 1's card; if player 1 holds the Ace, then the payoff vector is $(2, -2)$; if player 1 holds the King, then the payoff vector is $(-2, 2)$.

Represent this game in the extensive form and in the Bayesian normal form.



1 \ 2	B	F
Bb	0, 0	1, -1
Bf	1/2, 1/2	0, 0
Fb	-3/2, 3/2	0, 0
Ff	-1, 1	-1, 1

Bb, B and Bf, f and fb, f

$2p - 2(1-p)$

$2(1/2) - 2(1-1/2)$

$1 - 2(1/2)$

$1 - 1 = 0$

↑ all Paths where Payoffs are equal + opposite

Fe, F and Ff, B

$-1/2 - 1(1-1/2)$

$-1/2 - 1(1/2)$

$-1 \Rightarrow$ Flip sign

Bb, F

Full Flip Ff, B to 1, -1

Fb, B

$-2p - 1(1-p)$

$-1 - 1/2 = -3/2 \rightarrow$ then Flip sign $3/2$