

Ex.1.

$P(\text{Draw1}(i))$: The probability of drawing i in the first draw. ($i = 1,2,3,4$)

$P(\text{Draw2}(i) \mid \text{Cheater}, \text{Draw1}(i))$: The probability of drawing i in the second draw given that Player 2 is cheating and drew i in the first draw. ($i = 1,2,3,4$)

$P(\text{Draw2}(1) \mid \text{Cheater}, \text{Draw1}(4))$: The probability of drawing 1 in the second draw given that Player 2 is cheating and drew 4 in the first draw.

$P(\text{Coin}(0) \mid \text{Fair})$: The probability of the coin landing tails given that the coin is fair.

$P(\text{Coin}(1) \mid \text{Fair})$: The probability of the coin landing heads given that the coin is fair.

$P(\text{Coin}(0) \mid \text{Cheater})$: The probability of the coin landing tails given that Player 2 is cheating.

$P(\text{Highest}(1) \mid \text{Draw1}(\text{card1}), \text{Draw2}(\text{card2}))$: The probability of the highest card being drawn by Player 1 given the cards drawn by both players.

$P(\text{Highest}(2) \mid \text{Draw1}(\text{card1}), \text{Draw2}(\text{card2}))$: The probability of the highest card being drawn by Player 2 given the cards drawn by both players.

$P(\text{Winner}(1) \mid \text{Coin}(1), \text{Highest}(1))$: The probability of Player 1 winning given that the coin lands heads and Player 1 has the highest card.

$P(\text{Winner}(2) \mid \text{Coin}(0), \text{Highest}(2))$: The probability of Player 2 winning given that the coin lands tails and Player 2 has the highest card.

