Angry Madness: Payoff Detail

Your overall payoff will be determined by averaging your payoff in each of the 9 cases when you and your have M,U = 100, 200, or 400. Your expected payoff in each of these 9 cases is, in turn, calculated by checking every possible way that the game might end.

Bart's expected payoff when *M = $200 for Ann and U = $200* for Bart

We add up all of the terms below, which correspond to all ways the game might end:

First round, Bart yields	50% * $200	= 100
First round, Ann yields	0% * $300	
First round, both yield	0% * $200	
Anger after First round	50% * 10% * $0	

(Note: Chances we go on to second round = P1 = 50% * 90%.)

Second round, Bart yields	P1 * 25% * $200	= 22.5
Second round, Ann yields	P1 * 0% * $300	
Second round, both yield	P1 * 0% * $200	
Anger after Second round	P1 * 75% * 20% * $0	

(Note: Chances we go on to third round = P2= 50% * 90% * 75% * 80%.)

Third round, Bart yields	P2 * 75% * $200	= 40.5
Third round, Ann yields	P2 * 0% * $300	
Third round, both yield	P2 * 0% * $200	
Anger after Third round	P2 * 25% * 30% * $0	

(Note: Chances we go to fourth round = P3 = 50% * 90% * 75% * 80% * 25% * 70%.)

Third round, Bart yields	P2 * 100% * $200	= 9.45
Third round, Ann yields	P2 * 0% * $300	
Third round, both yield	P2 * 0% * $200	
Anger after Third round	P2 * 0% * 40% * $0	

Bart's Expected Payoff   = 172.45

… Bart would have been better off yielding for sure in Round 1 (which gives guaranteed payoff 200)

Ann's expected payoff when *M = $200 for Ann and U = $200* for Bart

We add up all of the terms below, which correspond to all ways the game might end:

First round, Bart yields	50% * $300	= 150
First round, Ann yields	0% * $200	
First round, both yield	0% * $200	
Anger after First round	50% * 10% * $0	

(Note: Chances we go on to second round = P1 = 50% * 90%.)

Second round, Bart yields	P1 * 25% * $300	= 33.75
Second round, Ann yields	P1 * 0% * $200	
Second round, both yield	P1 * 0% * $200	
Anger after Second round	P1 * 75% * 20% * $0	

(Note: Chances we go on to third round = P2= 50% * 90% * 75% * 80%.)

Third round, Bart yields	P2 * 75% * $300	= 60.75
Third round, Ann yields	P2 * 0% * $200	
Third round, both yield	P2 * 0% * $200	
Anger after Third round	P2 * 25% * 30% * $0	

(Note: Chances we go to fourth round = P3 = 50% * 90% * 75% * 80% * 25% * 70%.)

Third round, Bart yields	P2 * 100% * $300	= 14.175
Third round, Ann yields	P2 * 0% * $200	
Third round, both yield	P2 * 0% * $200	
Anger after Third round	P2 * 0% * 40% * $0	

Ann's Expected Payoff   = 258.675

… Ann is better off with her strategy than yielding for sure in Round 1 (which gives guaranteed payoff 200)