Math 36
Homework 05

Game Theory: Two-Player Zero-Sum Games (Part I)

After dinner, Alice and Bob go to 5 Olde Nugget for drinks. "I know a good game," says Bob. "We point fingers at each other; either one finger or two fingers. If we match with one finger, you buy me one drink. If we match with two fingers, you buy me two drinks. If we don't match, I let you off with a payment of $1.00." (Each drink costs $5.50.)

Alice thinks about this for a minute. "Well, it seems a bit in your favor. Now if you pay me $4.20 before each game, as partial compensation for all those $5.50 drinks I'll have to buy you, then I'll play the game."

(Adapted from *The Compleat Strategyst* by John Williams.)

1. Write the payoff matrix for Bob's version of this game.

2. What are the optimal strategies for Alice and Bob?

3. What is the value of this game? Does the side payment make the game fair?