1. Give an example of a game where there is a unique iterated weak dominant strategy equilibrium which is strictly Pareto dominated by a Nash equilibrium.

2. Does the following game have pure-strategy Nash equilibria? If Yes, find all of them, If No, prove it. Agent A auctions $1,000 to n players \((n > 1)\). Each player independently submits an envelope containing his/her bid in cash (any amount of cash can be put in the envelope and submitting an empty envelope is allowed). If one player’s bid exceeds all the other bids, then he/she wins the $1,000. If two or more players bid the highest amount, agent A keeps the $1,000, that is, nobody wins. The submitted envelopes are never returned to the players, that is, no player ever recovers his/her bid. Assume that all the players are selfish and greedy, that is, each player cares only about his/her own wealth and prefers more money to less.

3. Two players are involved in a dispute over an object. The value of the object to player \(i\) is \(v_i > 0\). Time is modeled as a continuous variable that starts at 0 and runs indefinitely. Each player chooses when to concede the object to the other player; if the first player to concede does so at time \(t\), the other player obtains the object at that time. If both players concede simultaneously, the object is split equally between them, player \(i\) receiving a payoff of \(\frac{v_i}{2}\). Time is valuable: until a concession is made by either player, each player loses $1 per unit of time. Formulate this situation as a strategic-form game and find all the pure-strategy Nash equilibria.