ECEN 5018 Spring 2014	Homework #7	**Vince Coghlan**

1) Consider the following multiagent system (vehicle target assignment problem) with the following elements:

- Set of vehicles: $\mathcal{V} = \{1, 2, 3\}$
- Vehicle detection probability p_1, p_2, $p_3 \in [0, 1]$
- Set of targets $\mathcal{T} = \{x, y\}$
- Set of possible assignments for each vehicle: $\mathcal{A}_i = \{x, y\}$, i.e., each vehicle can select only on of the two targets
- Target specific welfare functions: for any set of vehicles $S \subseteq \mathcal{V}$

$$W_x(S) = v_x \left[1 - \prod_{j \in S}(1 - p_j)\right]$$

$$W_y(S) = v_y \left[1 - \prod_{j \in S}(1 - p_j)\right]$$

- Global objective: Maximize total welfare

$$W(a) = W_x(\{a\}_x) + W_y(\{a\}_y)$$

where $\{a\}_x = \{i \in \mathcal{V} : t \in a_x\}$.

Part #1: Model the above multiagent system as a game with player set $\mathcal{V}$ and the wonderful life utility.

(a) What is the payoff matrix?