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Homework 2

**1.a)**

We chose to represent each state as Horizontal (H), Vertical (V), Diagonal (D) and Simultaneous (S).

* The first (H) represents wolf and hare are in the same row;
* The second (V)   represents wolf and hare are in the same column;
* The third (D) represents wolf and hare  in different rows and columns;
* Finally, the fourth (S) represent wolf and hare in the same row and column.

The map positions are indicated below.

X = {H, V, D, S}

A =  {up, down, left, right, stay}

**1.b)**

**Pstay**

[ 0.6  0.0  0.2  0.2]  
[ 0.0  0.6  0.2  0.2]  
[ 0.2  0.2  0.6  0.0]  
[ 0.2  0.2  0.0  0.6]

**Pup = Pdown**

[0.28 0.16 0.04 0.52]  
[0.16 0.28 0.52 0.04]  
[0.04 0.52 0.28 0.16]  
[0.52 0.04 0.16 0.28]

**Pright = Pleft**

[0.28 0.16 0.52 0.04]  
[0.16 0.28 0.04 0.52]  
[0.52 0.04 0.28 0.16]  
[0.04 0.52 0.16 0.28]

Cost(x) = 0 if x = S; 1 otherwise

**1.c)**

Cost-to-go function with π= wolf always goes up and ϒ=0.99

Horizontal:

Using **Pup**:

J = where row 1 is state V, row 2 is H, row 3 is D and row 4 is S