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CS 4710 Artificial Intelligence

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Homework 3 Report

U' after Value Iteration in Case 1

-1.0 0.0 -1.0 0.0 -1.0 0.0 -1.0

0.0 0.0 0.0 0.0 0.0 0.0 0.0

-1.0 0.0 -1.0 0.0 -1.0 0.0 -1.0

0.0 0.0 0.0 0.0 0.0 0.0 1.0

-1.0 0.0 -1.0 0.0 -1.0 0.0 0.0

0.0 0.0 0.0 0.0 0.0 0.0 -1.0

-1.0 0.0 -1.0 0.0 -1.0 0.0 0.0

An optimal path for Case 1 would be taking a straight path to the right like so:

(3,0) E to (3,1). (3,1) E to (3,2). (3,2) E to (3,3). (3,3) E to (3,4). (3,4) E to (3,5). (3,5) E to (3,6). This maximizes reward and gets us to the end in optimal number of moves.

Another optimal path for Case 1 might be to zigzag a little, like so:

(3,0) NE to (2,1). (2,1) SE to (3,2). (3,2) SE to (4,3). (4,3) NE to (3,4). (3,4) E to (3,5). (3,5) E to (3,6). This maximizes reward and gets us to the end in optimal number of moves. Essentially, this is a demonstration that moves like NE and SE are often equivalent to E and still maximize reward.

U' after Value Iteration in Case 2

-1.0 0.0 -1.0 0.0 -1.0 0.0 -1.0

0.0 0.0 0.0 0.0 0.0 0.0 0.0

-1.0 0.0 -1.0 0.0 0.0 0.0 -1.0

0.0 0.0 0.0 0.0 -1.0 0.0 1.0

-1.0 0.0 -1.0 0.0 0.0 0.0 0.0

0.0 0.0 0.0 0.0 0.0 0.0 -1.0

-1.0 0.0 -1.0 0.0 -1.0 0.0 0.0

Because there's wind blowing upwards in columns 3, 4 and 5, optimal paths will often involve more moves to the southeast.

An optimal for Case 2 might be the following:

(3,0) SE to (4,1). (4,1) SE to (5,2). (5,2) SE (with wind) to (5,3). (5,3) SE (with wind) to (5,4). (5,4) E (with wind) to (4,5). (4,5) NE to (3,6). Notice the

U' after Value Iteration in Case 3

-1.0 0.0 -1.0 0.0 -1.0 0.0 -1.0

0.0 0.0 0.0 0.0 0.0 0.0 0.0

-1.0 0.0 -1.0 0.0 0.0 0.0 -1.0

0.0 0.0 0.0 0.0 0.0 0.0 1.0

-1.0 0.0 -1.0 0.0 -1.0 0.0 0.0

0.0 0.0 0.0 0.0 0.0 0.0 -1.0

-1.0 0.0 -1.0 0.0 0.0 0.0 0.0