AI Assignment 2
Team 41

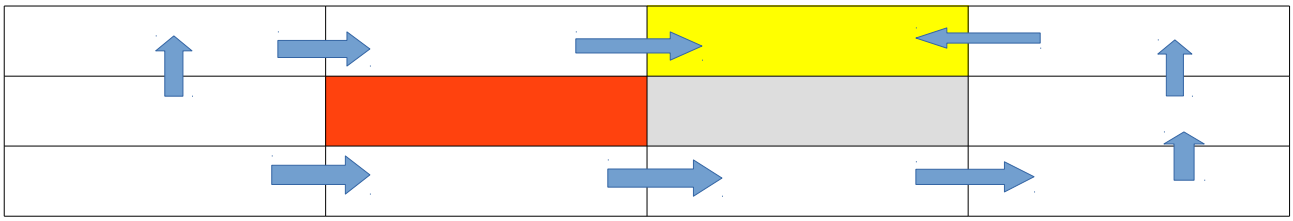
At delta = 2.05

Final Expected Reward = 14.0172 (Manual calculation tables shown below)

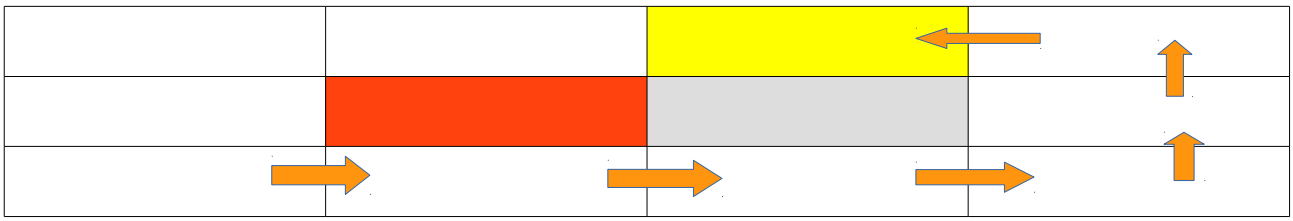
At delta = 0

Expected Reward is approximately equal to **17.23**(Calculation by program shown below)

POLICY-



Optimal Path From Start to terminal = (2,0) -> (2,1) -> (2,2)-> (2,3)-> (1,3)-> (0,3)-> (0,2)



Expected Reward From LP is 17.2306781667, which is same as VI output at delta=0.

Expected reward in VI and LP did not match because our delta in VI is 2.05 . If delta = 0 in VI then the expected reward would be the same as LP. Delta=0 runs the iteration multiple times more leading to more precise/better policy if there already dosen't exist one.

Values of X Matrix(taken from excel sheet)

	Matrix X
X(0,0,up)	0
X(0,0,down)	0
X(0,0,left)	0
X(0,0,right)	0.1217656012
X(0,1,up)	0
X(0,1,down)	0
X(0,1,left)	0
X(0,1,right)	0.10823609
X(0,2,noop)	0.8767123288
X(0,3,up)	0
X(0,3,down)	0
X(0,3,left)	0.987654321
X(0,3,right)	0
X(1,0,up)	0.1369863014
X(1,0,down)	0
X(1,0,left)	0
X(1,0,right)	0
X(1,1,noop)	0.1232876712
X(1,3,up)	1.1111111111
X(1,3,down)	0
X(1,3,left)	0
X(1,3,right)	0
X(2,0,up)	0
X(2,0,down)	0
X(2,0,left)	0
X(2,0,right)	1.1111111111
X(2,1,up)	0
X(2,1,down)	0
X(2,1,left)	0
X(2,1,right)	0.987654321
X(2,2,up)	0
X(2,2,down)	0
X(2,2,left)	0
X(2,2,right)	1.1111111111
X(2,3,up)	0.987654321
X(2,3,down)	0
X(2,3,left)	0
X(2,3,right)	0

Manual Value Iteration with delta=2.05 ; X=41 ; R(s,a)=-2.05

Timestamp 1

-2.05	26.65	41	30.75
-2.05	-41		-2.05
-2.05	-2.05	-2.05	-2.05

Timestamp 2

18.86	29.315	41	33.62
-4.1	-41		22.14
-4.1	-4.1	-4.1	-4.10

Timestamp 3

22.878	29.581	41	36.326
8.528	-41		29.274
-6.15	-6.15	-6.15	14.842

Timestamp 4

24.753	29.608	41	37.31
13.005	-41		32.865
3.542	-6.15	8.598	22.239

Timestamp 5

25.412	29.610	41	37.765
14.954	-41		34.371
8.093	0.1134	17.460	27.325

Timestamp 6

25.676	29.611	41	37.963
15.675	-41		35.036
10.733	7.829	23.302	29.925

Timestamp 7

25.733	29.611	41	38.049
15.958	-41		35.327
12.890	13.274	26.550	31.301

Timestamp 8

25.811	29.611	41	38.08
16.06	-41		35.454
13.332	16.41	28.3	31.996

Timestamp 9

25.825	29.611	41	38.103
16.104	-41		35.504
14.0172	18.131	29.20	32.342

Value Iteration wit Delta=0, Computed by a program

Iteration 1:

```
-2.05     26.65       41      30.75
-2.05      -41         0      -2.05
-2.05     -2.05      -2.05     -2.05
```

Iteration 2:

```
 18.86    29.315       41      33.62
-4.1       -41         0      22.14
-4.1      -4.1       -4.1     -4.1
```

Iteration 3:

```
23.083    29.5815     41      36.326
 8.733      -41        0      29.274
-6.15      -6.15    -6.15    15.252
```

Iteration 4:

```
24.7968    29.6082      41      37.31
13.1897      -41        0     32.8656
 4.5264    -6.15    9.7416     22.6894
```

Iteration 5:

```
25.4352    29.6108      41     37.7676
15.0064      -41        0     34.3711
 8.7494    1.43828    18.0498    27.4856
```

Iteration 6:

```
25.6828    29.6111      41     37.9639
```

15.6988 -41 0 35.0383
10.9739 8.4337 23.5484 30.0004

Iteration 7:

25.777 29.6111 41 38.0502
15.9661 -41 0 35.3287
12.4498 13.5321 26.66 31.3355

Iteration 8:

25.8132 29.6111 41 38.0879
16.0682 -41 0 35.4559
13.3211 16.5312 28.3504 32.0126

Iteration 9:

25.827 29.6111 41 38.1044
16.1074 -41 0 35.5115
14.1139 18.1835 29.2301 32.351

Iteration 10:

25.8323 29.6111 41 38.1116
16.1224 -41 0 35.5358
15.5189 19.0524 29.6769 32.5173

Iteration 11:

25.8344 29.6111 41 38.1147
16.1281 -41 0 35.5464
16.3561 19.4967 29.8992 32.5981

Iteration 12:

25.8351 29.6111 41 38.1161
16.1303 -41 0 35.5511
16.7958 19.7191 30.0083 32.6369

Iteration 13:

25.8354 29.6111 41 38.1167
16.1311 -41 0 35.5531
17.0179 19.8285 30.0612 32.6554

Iteration 14:

25.8355 29.6111 41 38.117
16.1315 -41 0 35.554
17.1277 19.8818 30.0865 32.6641

Iteration 15:

25.8356 29.6111 41 38.1171
16.1316 -41 0 35.5544
17.1813 19.9074 30.0986 32.6683

Iteration 16:

25.8356 29.6111 41 38.1171
16.1316 -41 0 35.5546
17.2072 19.9196 30.1043 32.6702

Iteration 17:

25.8356 29.6111 41 38.1172
16.1316 -41 0 35.5546
17.2196 19.9254 30.107 32.6711

Iteration 18:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2255 19.9282 30.1083 32.6715

Iteration 19:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2282 19.9294 30.1089 32.6717

Iteration 20:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2295 19.93 30.1091 32.6718

Iteration 21:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2302 19.9303 30.1093 32.6718

Iteration 22:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2304 19.9304 30.1093 32.6719

Iteration 23:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2306 19.9305 30.1094 32.6719

Iteration 24:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2306	19.9305	30.1094	32.6719

Iteration 25:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9305	30.1094	32.6719

Iteration 26:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 27:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 28:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 29:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 30:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 31:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 32:

25.8356	29.6111	41	38.1172

16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 33:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 34:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 35:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 36:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 37:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 38:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 39:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 40:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 41:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 42:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 43:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 44:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 45:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 46:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 47:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 48:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 49:

25.8356 29.6111 41 38.1172
16.1317 -41 0 35.5547
17.2307 19.9306 30.1094 32.6719

Iteration 50:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 51:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 52:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 53:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719

Iteration 54:

25.8356	29.6111	41	38.1172
16.1317	-41	0	35.5547
17.2307	19.9306	30.1094	32.6719