Assignment 2

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PART A (Value Iteration) -

Matrices with utilities for each cell iteration wise till convergence -

Iteration - 0

Wall	Wall	Terminal(52)	Wall
0	0	0	0
0	Terminal(-52)	Wall	0
0	0	0	0

Iteration -1

Wall	Wall	Terminal(52)	Wall
-2.6	-2.6	39.0	-2.6
-2.6	Terminal(-52)	Wall	-2.6
-2.6	-2.6	-2.6	-2.6

Iteration -2

Wall	Wall	Terminal(52)	Wall
-5.2	23.14	38.48	28.08
-5.2	Terminal(-52)	Wall	-5.2
-5.2	-5.2	-5.2	-5.2

Iteration - 3

Wall	Wall	Terminal(52)	Wall
14.872	25.298	44.122	30.472
-7.8	Terminal(-52)	Wall	18.824
-7.8	-7.8	-7.8	-7.8

Iteration - 4

Wall	Wall	Terminal(52)	Wall
18.3456	30.0274	44.577	37.6272
3.3176	Terminal(-52)	Wall	25.5424
-10.4	-10.4	-10.4	10.8992

Iteration - 5

Wall	Wall	Terminal(52)	Wall
23.58824	30.86434	45.76546	39.37856
7.20824	Terminal(-52)	Wall	32.61024
-2.02592	-13.0	4.03936	17.88384

Iteration - 6

Wall	Wall	Terminal(52)	Wall
25.17108	31.89883	46.02429	41.21128
11.79138	Terminal(-52)	Wall	35.42492
1.66397	-5.86848	12.51492	25.68048

Iteration - 7

Wall	Wall	Terminal(52)	Wall
26.61529	32.20932	46.31101	41.88306
13.51602	Terminal(-52)	Wall	37.45402
6.41267	1.62507	20.44738	29.55946

Iteration - 8

Wall	Wall	Terminal(52)	Wall
27.18057	32.46973	46.40924	42.38251
14.84384	Terminal(-52)	Wall	38.39728
9.01658	8.72043	25.13708	32.36389

Iteration - 9

Wall	Wall	Terminal(52)	Wall
27.5782	32.57433	46.48522	42.60534
15.42886	Terminal(-52)	Wall	38.98546
11.04874	13.18172	28.31854	33.86794

Iteration - 10

Wall	Wall	Terminal(52)	Wall
27.76015	32.64559	46.51796	42.74724
15.80545	Terminal(-52)	Wall	39.28134
12.16616	16.17297	30.15802	34.80704

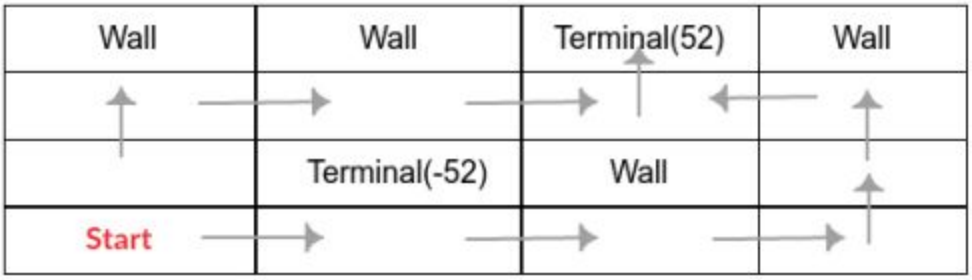
Iteration - 11

Wall	Wall	Terminal(52)	Wall
27.87304	32.67896	46.53928	42.81725
15.98863	Terminal(-52)	Wall	39.45042
13.13557	17.9437	31.2772	35.32154

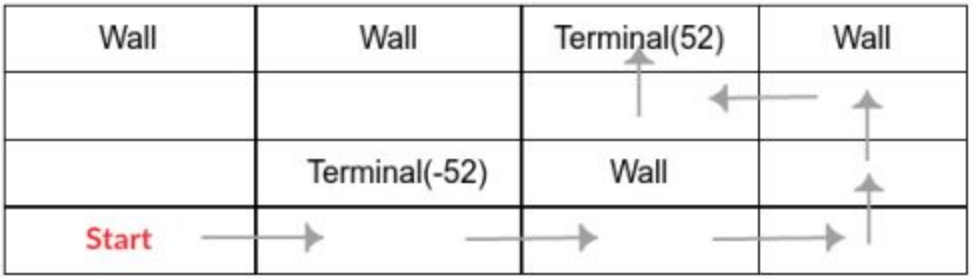
Final expected utilities for each cell -

Wall	Wall	Terminal(52)	Wall
27.87304	32.67896	46.53928	42.81725
15.98863	Terminal(-52)	Wall	39.45042
13.13557	17.9437	31.2772	35.32154

Optimal policy for each state -



Optimal path from start to positive terminal state -



Part B (Linear Programming) -

Values of X -

State , Action pair	Value of X
3,5	0.864702571
5,1	0
5,2	0
5,3	0
5,4	0.121765601
6,1	0
6,2	0
6,3	0
6,4	0.228333669
7,1	1.080878214
7,2	0
7,3	0
7,4	0
8,1	0
8,2	0
8,3	1.122764098
8,4	0
9,1	0.136986301
9,2	0
9,3	0
9,4	0

10,5	0.135297429
12,1	1.127999833
12,2	0
12,3	0
12,4	0
13,1	0
13,2	0
13,3	0
13,4	1.111111111
14,1	0
14,2	0
14,3	0
14,4	0.987654321
15,1	0
15,2	0
15,3	0
15,4	1.111111111
16,1	0.987654321
16,2	0
16,3	0
16,4	0

Expected Utility obtained by solving LP -

17.08679506

Utility using LP/ Utility using VI = 1.30080347