

CS3613 – INTRODUCTION TO ARTIFICIAL INTELLIGENCE

LAB – MDPs

NAME : K.S. RANASINGHE

INDEX NO. : 210518H

EXERCISE 01

State	Expected utility for taking each action					Best Action	Expected Utility for Best Action	Updated Utility
	North	East	South	West	Nothing			
1	0	0	0	0	0	-	0	-0.1
2	0	0	0	0	0	-	0	-0.1
3	0	0	0	0	0	-	0	1
4	0	0	0	0	0	-	0	-0.1
5	0	0	0	0	0	-	0	-0.1
6	0	0	0	0	0	-	0	-0.05

1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-0.1	-0.1999
2	-0.045	0.89	-0.045	-0.1	-0.1	East	0.89	0.7891
3	0	0.9475	0.945	-0.0425	1	Nothing	1	1
4	-0.1	-0.1	-0.1	-0.1	-0.1	-	-0.1	-0.1999
5	-0.0975	-0.055	-0.0975	-0.1	-0.1	East	-0.055	-0.1549
6	-0.0525	0.0025	0.8925	-0.0425	-0.05	South	0.8925	0.8416

1	-0.1505	0.6902	-0.1505	-0.1999	-0.1999	East	0.6902	0.5895
2	-0.0994	0.9317	0.7502	-0.1482	0.7891	East	0.9317	0.8308
3	0.8469	0.9921	0.9895	0.8023	1	Nothing	1	1
4	-0.1976	-0.1594	-0.1976	-0.1999	-0.1999	East	-0.1594	-0.2592
5	-0.1073	0.7892	0.7423	-0.1482	-0.1549	East	0.7892	0.6884
6	0.7918	0.8495	0.9343	-0.0473	0.8416	South	0.9343	0.8834

EXERCISE 02

4 East	5 East	6 South
1 East	2 East	3 Nothing

EXERCISE 03

What is the best policy at the end?

Same as given above.

4 East	5 East	6 South
1 East	2 East	3 Nothing

On what iteration does the policy converge?

3

How many iterations does it take the utilities to converge?

12

```
Iteration 11
[0.72981, 0.87062, 0.77548, 0.76719, 0.76973, 'East', 0.87062, 0.76975]
[0.83392, 0.98565, 0.88467, 0.7784, 0.88465, 'East', 0.98565, 0.88466]
[0, 0, 0, 0, 0, '-', 0, 1]
[0.72445, 0.81987, 0.77012, 0.72153, 0.71899, 'East', 0.81987, 0.71905]
[0.82825, 0.9292, 0.879, 0.73274, 0.82826, 'East', 0.9292, 0.82827]
[0.93183, 0.94042, 0.98828, 0.8423, 0.93728, 'South', 0.98828, 0.93729]

Iteration 12
[0.72987, 0.87063, 0.7755, 0.76721, 0.76975, 'East', 0.87063, 0.76976]
[0.83393, 0.98565, 0.88468, 0.77842, 0.88466, 'East', 0.98565, 0.88466]
[0, 0, 0, 0, 0, '-', 0, 1]
[0.72451, 0.81988, 0.77014, 0.72158, 0.71905, 'East', 0.81988, 0.71906]
[0.82826, 0.92921, 0.87901, 0.73279, 0.82827, 'East', 0.92921, 0.82828]
[0.93184, 0.94043, 0.98828, 0.84231, 0.93729, 'South', 0.98828, 0.93729]
```