



IA353A - Neural Networks EFC4

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Question 8: RL

https://drive.google.com/file/d/1Xya6E4BgNVOPlzPRKbb3C59rvKI6V2nk/view?usp=sharing

8.1 Training results and two study cases

8.1.1 Maze 1

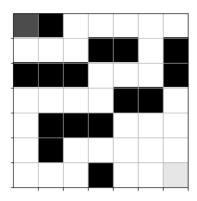
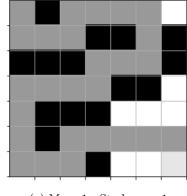


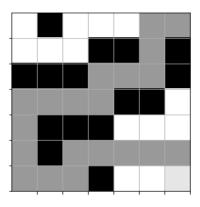
Figure 2: Maze 1

Epoch	Loss	Episodes	Win count	Win rate	Time
0	0.0317	51	1	0.000	$2.7 \mathrm{\ s}$
10	0.0766	109	5	0.000	$45.6 \mathrm{\ s}$
20	0.0023	102	10	0.000	77.8 s
30	0.0012	6	17	0.625	$97.6 \mathrm{\ s}$
40	0.0627	103	24	0.667	117.0 s
50	0.0010	6	30	0.708	$143.0 \ s$
60	0.0025	4	39	0.708	$152.4 \mathrm{\ s}$
70	0.0065	102	46	0.750	$176.5 { m \ s}$
80	0.0019	2	56	0.833	$188.0 \mathrm{\ s}$
90	0.0013	23	66	0.958	$198.4 \mathrm{\ s}$
94	0.0010	21	70	1.000	199.8 s

Table 1: Training results summary for maze 1



(a) Maze 1 - Study case 1



(b) Maze 1 - Study case 2

8.1.2 Maze 2

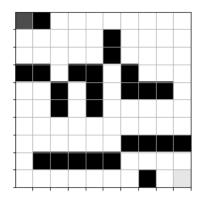
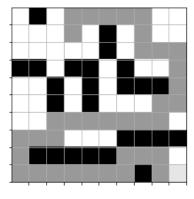


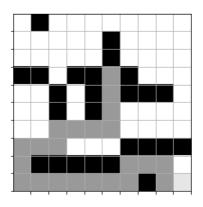
Figure 4: Maze 2

Epoch	Loss	Episodes	Win count	Win rate	Time
0	0.0856	147	1	0.000	8.8 s
10	0.0011	219	4	0.000	128.4 s
20	0.0042	55	6	0.000	237.7 s
30	0.0041	21	13	0.000	297.6 s
40	0.0044	67	22	0.000	346.0 s
50	0.0026	30	31	0.600	$380.5 { m s}$
60	0.0043	23	41	0.740	6.69 min
70	0.0006	18	51	0.900	7.00 min
80	0.0071	35	61	0.960	7.44 min
90	0.0005	18	71	0.980	7.67 min
100	0.0015	4	81	1.000	7.92 min
110	0.0010	11	91	1.000	8.16 min
120	0.0008	18	101	1.000	8.43 min
130	0.0004	19	111	1.000	8.84 min
140	0.0012	20	121	1.000	9.13 min
150	0.0007	34	131	1.000	9.54 min
160	0.0013	61	141	1.000	9.83 min
165	0.0002	28	146	1.000	9.99 min

Table 2: Training results summary for maze 2



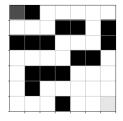
(a) Maze 2 - Study case 1



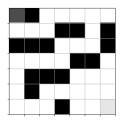
(b) Maze 2 - Study case 2

8.2 Q-value for three different states

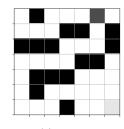
8.2.1 Maze 1 - Study case 1



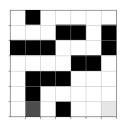
(a) Maze 1: Study case 1



(b) State 1

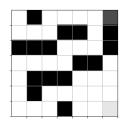


(c) State 2

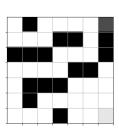


(d) State 3

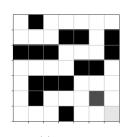
8.2.2 Maze 1 - Study case 2



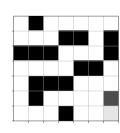
(a) Maze 1: Study case 1



(b) State 1

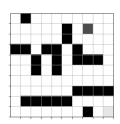


(c) State 2

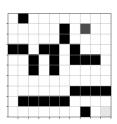


(d) State 3

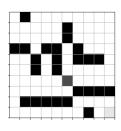
8.2.3 Maze 2 - Study case 1



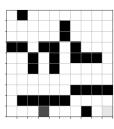
(a) Maze 1: Study case 1



(b) State 1

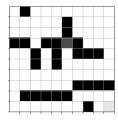


(c) State 2

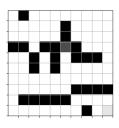


(d) State 3

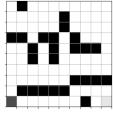
8.2.4 Maze 2 - Study case 2



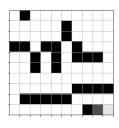
(a) Maze 2: Study case 2



(b) State 1



(c) State 2



(d) State 3

- 8.3 RMS during the training
- 8.4 Experience replay
- 9 Question 9: GAN

 $https://drive.google.com/file/d/1WWdc3M0UObMp1jVCcndmor6BTdLe18_e/view?usp=sharing$

- 9.1 MNIST
- 9.2 CIFAR-100 (class: oak tree)
- 10 Question 10: NLP

 $https://drive.google.com/file/d/1EAU2toNRn-MjXyO_YAsZFejdaJDapibX/view?usp=sharing$

- 10.1 Word2Vec
- 10.2 t-SNE
- 10.3 Results discussion