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

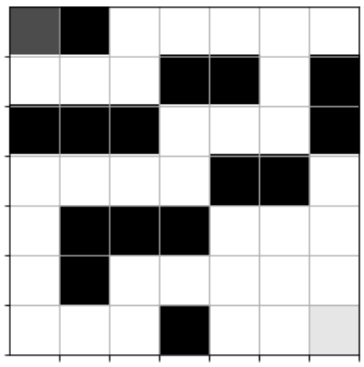
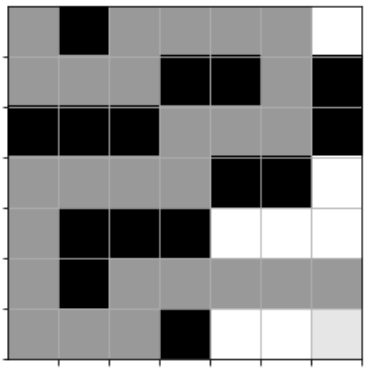


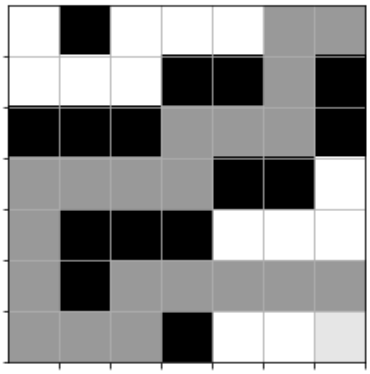
Figure 2: Maze 1

Epoch	Loss	Episodes	Win count	Win rate	Time
0	0.0317	51	1	0.000	2.7 s
10	0.0766	109	5	0.000	45.6 s
20	0.0023	102	10	0.000	77.8 s
30	0.0012	6	17	0.625	97.6 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 s
70	0.0065	102	46	0.750	176.5 s
80	0.0019	2	56	0.833	188.0 s
90	0.0013	23	66	0.958	198.4 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

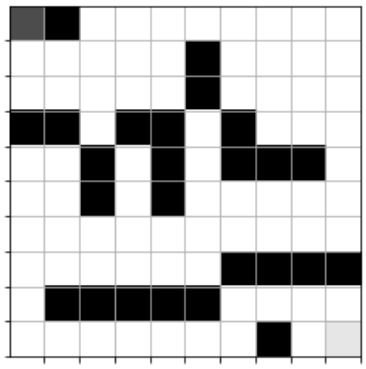
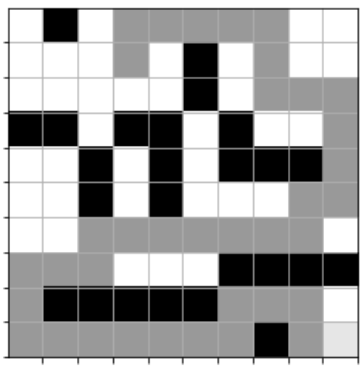


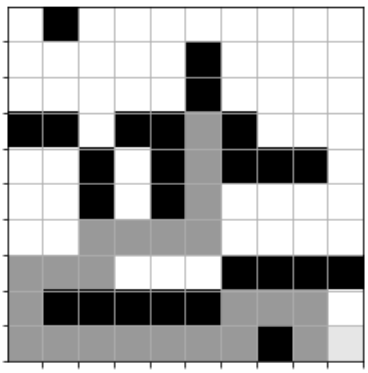
Figure 4: Maze 2

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 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



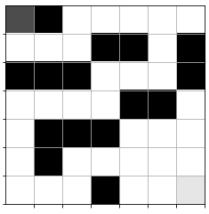
(a) Maze 2 - Study case 1



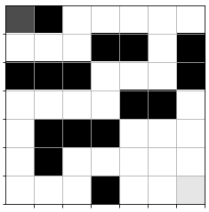
(b) Maze 2 - Study case 2

8.2 Q-value for three different states

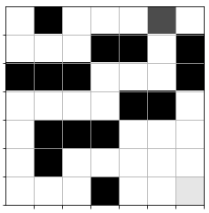
8.2.1 Maze 1 - Study case 1



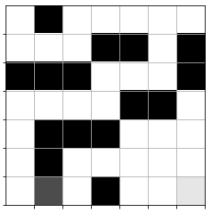
(a) Maze 1: Study case 1



(b) State 1
- left: -0.6266
- up: -0.4188
- right: -0.0743
- down: 0.0651

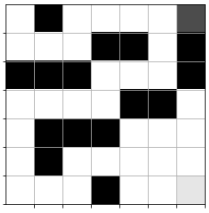


(c) State 2
- left: -0.4398
- up: -0.4012
- right: -0.2719
- down: -0.1840

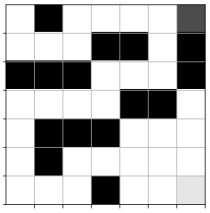


(d) State 3
- left: -0.0811
- up: -0.0670
- right: 0.4976
- down: 0.0538

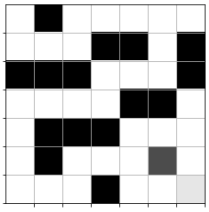
8.2.2 Maze 1 - Study case 2



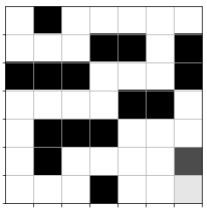
(a) Maze 1: Study case 2



(b) State 1
- left: -0.3038
- up: -0.4816
- right: -0.8406
- down: -0.4413

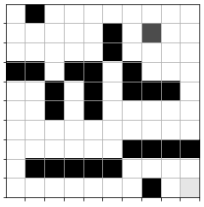


(c) State 2
- left: 0.3047
- up: 0.6444
- right: 0.9281
- down: 0.0919

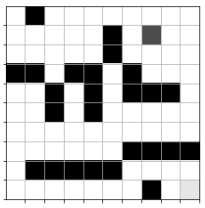


(d) State 3
- left: 0.3186
- up: 0.6454
- right: -1.9548
- down: 1.0120

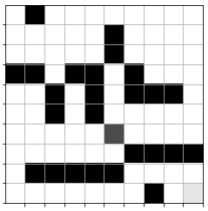
8.2.3 Maze 2 - Study case 1



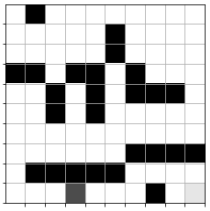
(a) Maze 1: Study case 1



(b) State 1
- left: -0.5747
- up: -0.4207
- right: -0.4067
- down: -0.3697

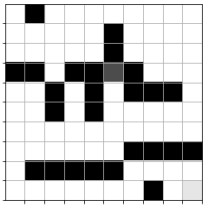


(c) State 2
- left: -0.2018
- up: -0.6692
- right: -0.5693
- down: -0.6134

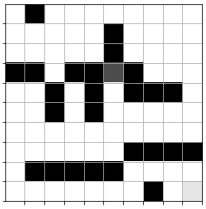


(d) State 3
- left: 0.1001
- up: -0.1958
- right: 0.4426
- down: -0.0384

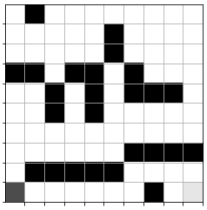
8.2.4 Maze 2 - Study case 2



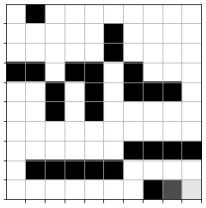
(a) Maze 2: Study case 2



(b) State 1
- left: -0.5848
- up: -0.6763
- right: -0.4808
- down: -0.2210



(c) State 2
- left: -0.0098
- up: -0.2776
- right: 0.2342
- down: 0.0314

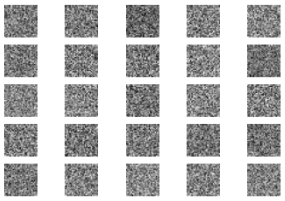


(d) State 3
- left: -0.2766
- up: 0.0523
- right: 0.9958
- down: -0.1527

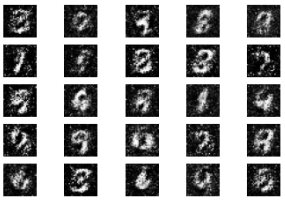
9 Question 9: GAN

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

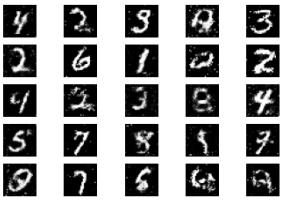
9.1 MNIST



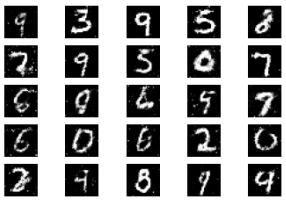
(a) Epoch 0



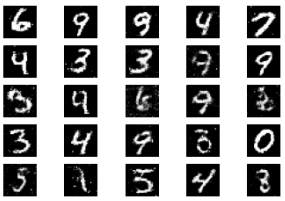
(b) Epoch 1,000



(c) Epoch 10,000



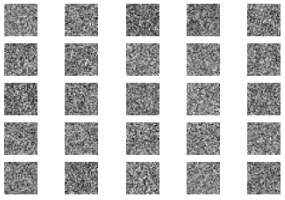
(d) Epoch 20,000



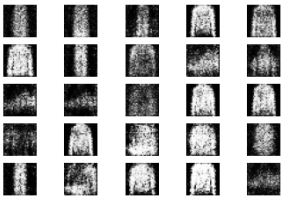
(e) Epoch 30,000

Figure 10: GAN trained for MNIST dataset

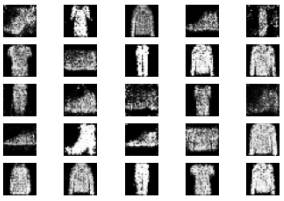
9.2 Fashion MNIST



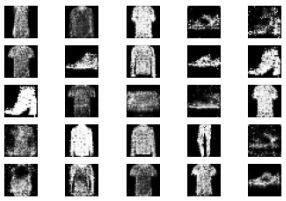
(a) Epoch 0



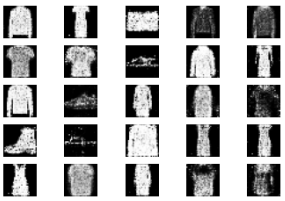
(b) Epoch 1,000



(c) Epoch 10,000



(d) Epoch 20,000



(e) Epoch 30,000

Figure 11: GAN trained for fashion MNIST dataset

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