B00902123
資工四 楊筑媛

Environment

Finished first version of code on Sublime Text 2. Uploaded onto CSIE workstation for compiling and testing. Minor corrections and updates of my code during testing were done directly using vim on the workstation.

Compilation of the code done by executing “make” on workstation within my folder. (After Makefile finished and uploaded as well)

Execution of code done as TA instructed:

```
./train   100   model_init.txt   seq_model_01.txt model_01.txt
./train   100   model_init.txt   seq_model_02.txt model_02.txt
./train   100   model_init.txt   seq_model_03.txt model_03.txt
./train   100   model_init.txt   seq_model_04.txt model_04.txt
./train   100   model_init.txt   seq_model_05.txt model_05.txt

./test   modellist.txt   testing_data1.txt   result1.txt
./test   modellist.txt   testing_data2.txt   result2.txt
```

For accuracy test:

```
./accuracy result1.txt testing_answer.txt acc.txt
```

Result Summary

One of the problems I encountered while doing this homework that took up some of my time was that I got confused by “accumulate through all samples”. I ended up adding up gamma and epsilon for all the iterations by accident. (I did initialization in the wrong loop.) For a few hours, I couldn’t figure out why my numbers were okay some of the time and illogical some other times.

The below are screenshots of my model_01.txt. Left is for 100 iterations. Right 1000 iterations. Accuracy for 100 is about 0.81, while 1000 gives an accuracy of about 0.86.

```
initial: 6
1.00000 0.00000 0.00000 0.00000 0.00000 0.00000

transition: 6
0.62304 0.16824 0.09225 0.11647 0.00000 0.00000
0.00005 0.60168 0.22947 0.16881 0.00000 0.00000
0.00000 0.00237 0.25649 0.69579 0.02448 0.02087
0.00000 0.00017 0.22936 0.25258 0.38806 0.12982
0.00007 0.49636 0.00000 0.00000 0.15358 0.34998
0.00003 0.50181 0.00000 0.00000 0.07695 0.42121

observation: 6
0.42902 0.09931 0.00583 0.10682 0.00000 0.00000
0.35571 0.10216 0.00481 0.10856 0.00000 0.00000
0.18317 0.79853 0.48154 0.28739 0.00000 0.00000
0.03210 0.00000 0.50325 0.38966 0.00000 0.00000
0.00000 0.00000 0.00457 0.10756 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 1.00000 1.00000
```

```
initial: 6
1.00000 0.00000 0.00000 0.00000 0.00000 0.00000

transition: 6
0.62315 0.16875 0.08659 0.12151 0.00000 0.00000
0.00000 0.60203 0.21979 0.17818 0.00000 0.00000
0.00000 0.00182 0.23371 0.73262 0.01735 0.01451
0.00000 0.00000 0.22206 0.26849 0.38168 0.12777
0.00000 0.49643 0.00000 0.00000 0.15304 0.35052
0.00000 0.50186 0.00000 0.00000 0.07719 0.42095

observation: 6
0.42888 0.09945 0.00301 0.10493 0.00000 0.00000
0.35558 0.10232 0.00163 0.10676 0.00000 0.00000
0.18314 0.79823 0.48643 0.29165 0.00000 0.00000
0.03240 0.00000 0.50540 0.39221 0.00000 0.00000
0.00000 0.00000 0.00353 0.10445 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 1.00000 1.00000
```