Homework #1

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Basic Algorithm

1. Execute the Makefile with the command `make`.
2. Implement the executable file "train" to train the seq_model and as a result get the model with command `./train $iter model_init.txt seq_model_0$i.txt model_0$i.txt`, where `$iter` is the number of iteration and `$i` is the number from 1 to 5.
3. Implement the executable file "test" to test the testing_data and as a result get the result with the command `./test model list.txt testing_data$i.txt result$i.txt`, where `$i` is the number from 1 to 2.
4. Test the accuracy of the result by comparing the `testing_answer.txt` and `result1.txt` and output the result to the file `acc.txt`: `0.864000` with the iteration 2000.

Advanced Examination

1. Execute the shell script to automatically execute the program with different number of iteration.

```
for i in {1..50}
do
    iter=$((100*i))

    ./train $iter model_init.txt seq_model_01.txt model_01_$i.txt &
    ./train $iter model_init.txt seq_model_02.txt model_02_$i.txt &
    ./train $iter model_init.txt seq_model_03.txt model_03_$i.txt &
    ./train $iter model_init.txt seq_model_04.txt model_04_$i.txt &
    ./train $iter model_init.txt seq_model_05.txt model_05_$i.txt &

    # ./test modellist_$i.txt testing_data1.txt result1_$i.txt
    # ./acc testing_answer.txt result1_$i.txt acc1_$i.txt

    # echo `cat acc1_$i.txt` $i >> cmp.txt
done
```

2. Download the needed file "`cmp.txt`" to my desktop with the command `scp b05902120@linux11.csie.org:~/Assign1/cmp.txt /Desktop`.
3. Write the program "`best.py`" to search for the highest accuracy.

```python
# platform: python3 MacOS
from numpy import loadtxt
import numpy as np
import matplotlib.pyplot as plt

bestset = loadtxt("cmp.txt")
print (bestset)
x = bestset[0:50, 1:2] * 100
y = bestset[0:50, 0:1]

num = 0
lar = -1
for N in range(50):
    if bestset[N][0] >= lar:
        num = (N + 1) * 100
        lar = bestset[N][0]

print ("The iteration with the best accuracy is:", num)
print ("The accuracy of the iteration above is:", lar)
plt.title('Iteration V.S. Accuracy')
plt.xlabel('Iteration')
plt.ylabel('Accuracy')
plt.plot(x, y)
```

4. Execute the program with the command `python3 best.py`, and eventually get the final consequence.

   `The iteration with the best accuracy is:2100;`

   `The accuracy of the iteration above is:0.8644.`