Assignment #1.1

1. +編譯結果

```
chance@chance-ASUS-TUF-Gaming-A15-FA506QR-FA506QR:~/datastructure_hw1.1$ cd src
chance@chance-ASUS-TUF-Gaming-A15-FA506QR-FA506QR:~/datastructure_hw1.1/src$ gcc main.c layer.c neuron.c -o main -lm
chance@chance-ASUS-TUF-Gaming-A15-FA506QR-FA506QR:~/datastructure_hw1.1/src$ ./main
```

2. 執行結果

```
Enter the number of Layers in Neural Network:
4
Enter number of neurons in layer[1]:
2
Enter number of neurons in layer[2]:
4
Enter number of neurons in layer[3]:
4
Enter number of neurons in layer[4]:
1

Created Layer: 1
Number of Neurons in Layer 1: 2
Neuron 1 in Layer 1 created
Neuron 2 in Layer 1 created

Created Layer: 2
Number of Neurons in Layer 2: 4
Neuron 1 in Layer 2 created
Neuron 2 in Layer 2 created
Neuron 3 in Layer 2 created
Neuron 4 in Layer 2 created

Created Layer: 3
Number of Neurons in Layer 3: 4
Neuron 1 in Layer 3 created
Neuron 2 in Layer 3 created
Neuron 3 in Layer 3 created
Neuron 4 in Layer 3 created

Created Layer: 4
Number of Neurons in Layer 4: 1
Neuron 1 in Layer 4 created
```

```
Enter the number of training examples:
4

Enter the Inputs for training example[0]:
0 0

Enter the Inputs for training example[1]:
0 1

Enter the Inputs for training example[2]:
1 0

Enter the Inputs for training example[3]:
1 1

Enter the Desired Outputs (Labels) for training example[0]:
0

Enter the Desired Outputs (Labels) for training example[1]:
1

Enter the Desired Outputs (Labels) for training example[2]:
1

Enter the Desired Outputs (Labels) for training example[3]:
0
```

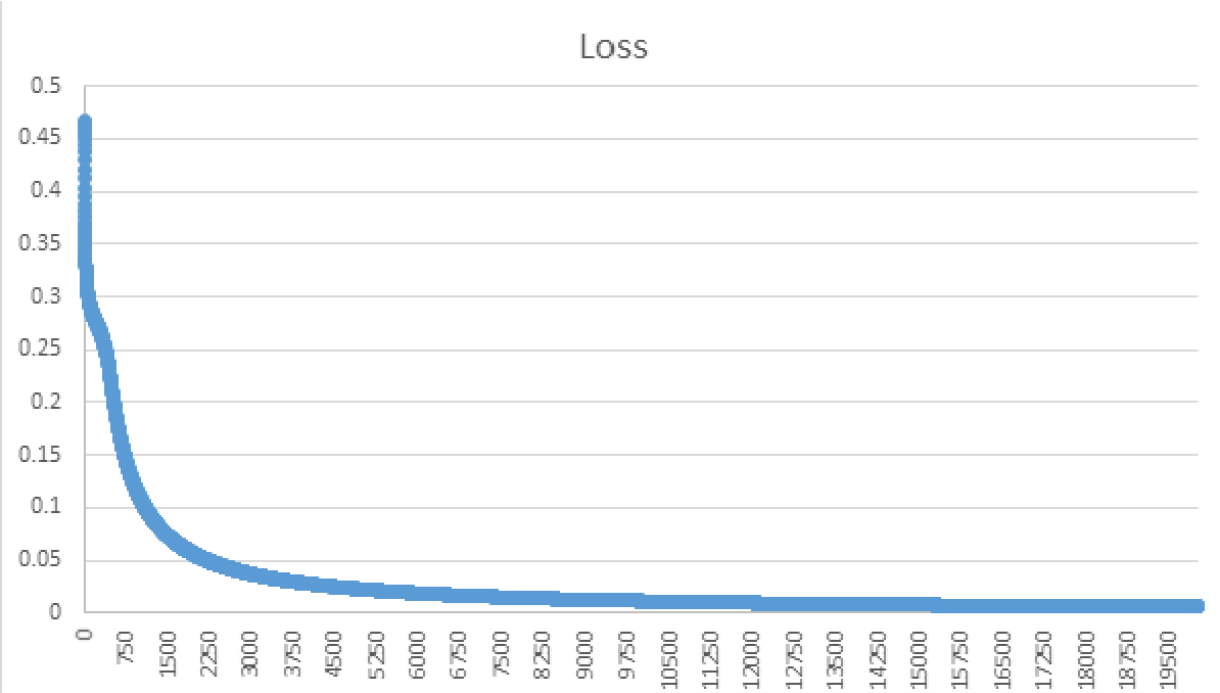
```
Initializing weights...
0:w[0][0]: 0.747612
1:w[0][0]: 0.979797
2:w[0][0]: 0.412897
3:w[0][0]: 0.092521
0:w[0][1]: 0.743439
1:w[0][1]: 0.008987
2:w[0][1]: 0.775659
3:w[0][1]: 0.088215
0:w[1][0]: 0.226093
1:w[1][0]: 0.866267
2:w[1][0]: 0.852774
3:w[1][0]: 0.702032
0:w[1][1]: 0.813198
1:w[1][1]: 0.331540
2:w[1][1]: 0.422643
3:w[1][1]: 0.991431
0:w[1][2]: 0.135379
1:w[1][2]: 0.806902
2:w[1][2]: 0.911171
3:w[1][2]: 0.014605
0:w[1][3]: 0.385023
1:w[1][3]: 0.908661
2:w[1][3]: 0.144115
3:w[1][3]: 0.884579
0:w[2][0]: 0.546034
0:w[2][1]: 0.401979
0:w[2][2]: 0.564515
0:w[2][3]: 0.386167

Neural Network Created Successfully...

Enter the learning rate (Usually 0.15):
0.15
```

3. 分析

LOSS 的數據分析在 DATA(EXCEL)中，由作圖可顯示 ERROR 越來越小，最後趨向 0。


Loss
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
750
1500
2250
3000
3750
4500
5250
6000
6750
7500
8250
9000
9750
10500
11250
12000
12750
13500
14250
15000
15750
16500
17250
18000
18750
19500