Experimental report on deep learning of symbolic value data

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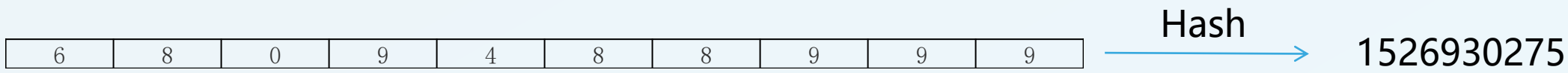
DataSet

01 Generate

Number of Instances: 1000000
Number of Attributes: 10
number of each Attributes:10
Class Distribution: 0, 1



1526930275

0 <= first number <=4 → 0

5 <= first number <=9 → 1

0	1
488822	511178

DataSet

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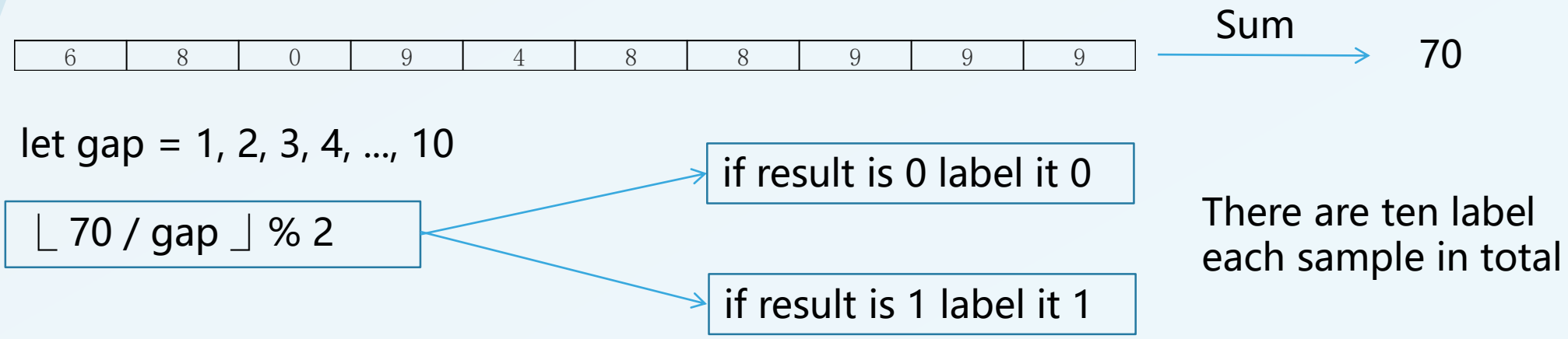
Class Distribution: 0, 1



DataSet

01 Generate

Number of Instances: 1000000
Number of Attributes: 10
number of each Attributes:10
Class Distribution: 0, 1

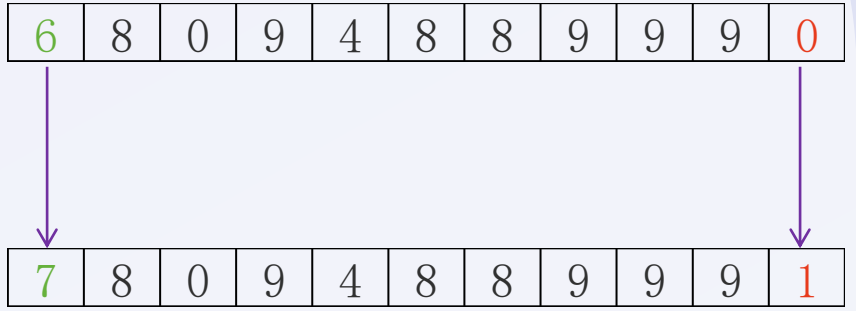
gap	0	1
1	501214	498786
2	500124	499876
3	500579	499421
4	500351	499649
5	500542	499458
6	500981	499019
7	499560	500440
8	500000	500000
9	499558	500442
10	506857	493143

01 Representation

scale	1 layer, 100 node		3 layer, 100 node		5 layer, 100 node		hash		
gap	Training accuracy	Testing accuracy	Training accuracy	Testing accuracy	Training accuracy	Testing accuracy	scale	Training accuracy	Testing accuracy
1	0. 501435	0. 499865	0. 5012525	0. 50106	0. 49878875	0. 498775	1 layer, 100 node	0. 5113938	0. 510315
2	0. 49975	0. 50038	0. 500115	0. 50016	0. 50021	0. 49978			
3	0. 5007325	0. 499965	0. 49958625	0. 49876	0. 4995075	0. 499075	2 layer, 100 node	0. 5113938	0. 510315
4	0. 5004125	0. 50016	0. 49962	0. 499765	0. 5005525	0. 499545			
5	0. 50074125	0. 499745	0. 49938	0. 49977	0. 49979125	0. 498125			
6	0. 499095	0. 498715	0. 50099375	0. 50093	0. 5010475	0. 500715			
7	0. 50066	0. 49956	0. 50047	0. 50032	0. 50024	0. 50124	3 layer, 100 node	0. 5113938	0. 510315
8	0. 49959	0. 50164	0. 50035875	0. 498565	0. 500015	0. 49994			
9	0. 96906375	0. 96909	0. 4993275	0. 50048	0. 4996675	0. 49912			
10	0. 99615625	0. 996245	0. 9995475	0. 999515	0. 9898625	0. 98999			

	1 layer, 100 node		3 layer, 100 node		5 layer, 100 node	
gap	Training accuracy	Testing accuracy	Training accuracy	Testing accuracy	Training accuracy	Testing accuracy
1	0.501435	0.499865	0.5012525	0.50106	0.49878875	0.498775
2	0.49975	0.50038	0.500115	0.50016	0.50021	0.49978
3	0.5007325	0.499965	0.49958625	0.49876	0.4995075	0.499075
4	0.5004125	0.50016	0.49962	0.499765	0.5005525	0.499545
5	0.50074125	0.499745	0.49938	0.49977	0.49979125	0.498125
6	0.499095	0.498715	0.50099375	0.50093	0.5010475	0.500715
7	0.50066	0.49956	0.50047	0.50032	0.50024	0.50124
8	0.49959	0.50164	0.50035875	0.498565	0.500015	0.49994
9	0.96906375	0.96909	0.4993275	0.50048	0.4996675	0.49912
10	0.99615625	0.996245	0.9995475	0.999515	0.9898625	0.98999

gap = 1



	1 layer, 100 node		3 layer, 100 node		5 layer, 100 node	
gap	Training accuracy	Testing accuracy	Training accuracy	Testing accuracy	Training accuracy	Testing accuracy
1	0.501435	0.499865	0.5012525	0.50106	0.49878875	0.498775
2	0.49975	0.50038	0.500115	0.50016	0.50021	0.49978
3	0.5007325	0.499965	0.49958625	0.49876	0.4995075	0.499075
4	0.5004125	0.50016	0.49962	0.499765	0.5005525	0.499545
5	0.50074125	0.499745	0.49938	0.49977	0.49979125	0.498125
6	0.499095	0.498715	0.50099375	0.50093	0.5010475	0.500715
7	0.50066	0.49956	0.50047	0.50032	0.50024	0.50124
8	0.49959	0.50164	0.50035875	0.498565	0.500015	0.49994
9	0.96906375	0.96909	0.4993275	0.50048	0.4996675	0.49912
10	0.99615625	0.996245	0.9995475	0.999515	0.9898625	0.98999

scale	1 layer, 100 node	
gap	Training accuracy	Testing accuracy
11	0.99833625	0.998315
12	0.9987975	0.99876
13	0.9980375	0.99779
14	0.9991675	0.999115
15	0.9982525	0.99816
16	0.99895875	0.998825
17	0.99921	0.999215
18	0.99840875	0.99824
19	0.99966375	0.999635
20	0.99887125	0.99894

Conclusion

Hash funtion is difficult to learn for tradictional nerual network

The function of label has great influence on the performance of neural network.

THANK YOU!