Introduction to Neural Networks
Homework #2-2

機械所
張元睿
N16054629

November 10, 2016

1. Iris

Table 1: parameters of iris

	Epoch	Learning rate	first hidden	second hidden
HW2	20	0.1	2	3
toolbox	N/A	0.0015	2	3

(a) results from HW2

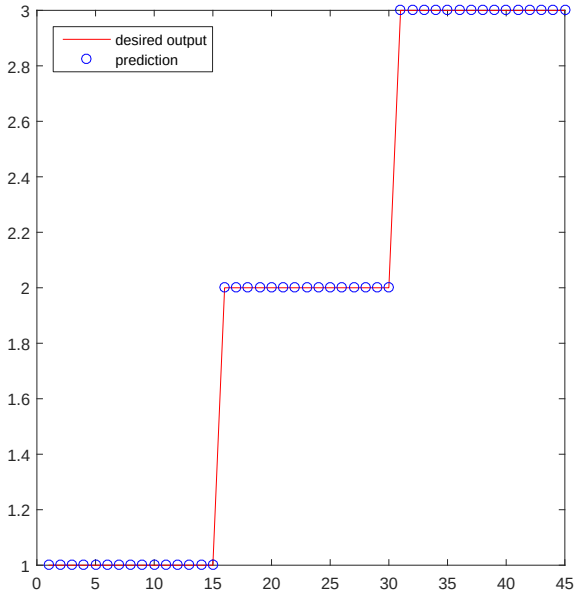
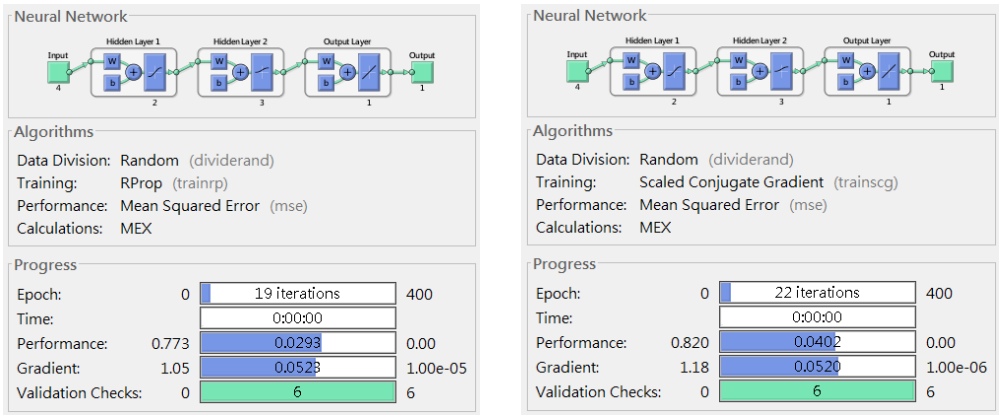


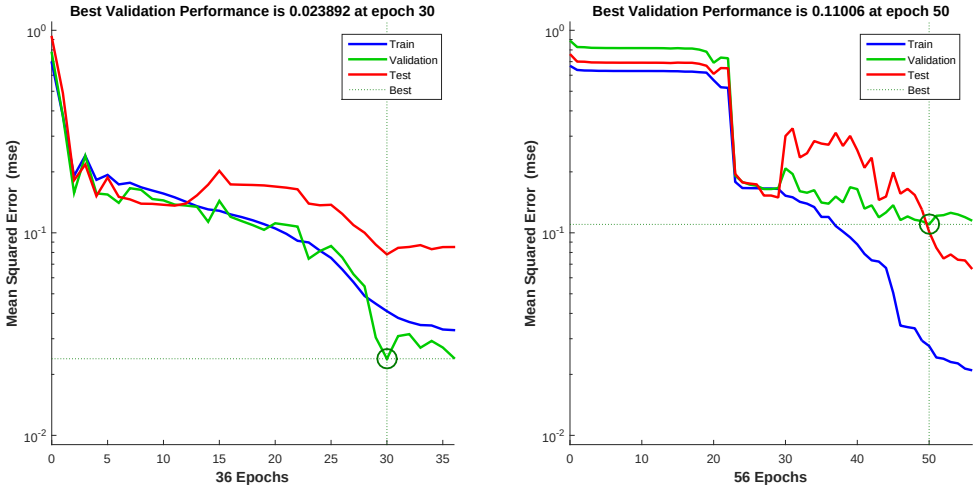
Figure 1: accuracy: 100%

(b) results from toolbox



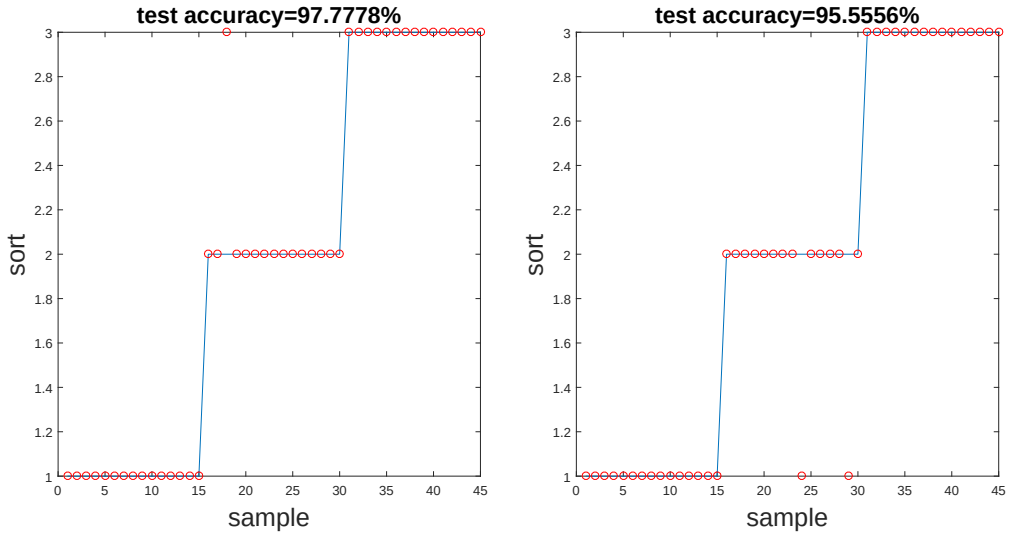
(a) RP (b) SCG

Figure 2: Sturctures & Parameters



(a) RP (b) SCG

Figure 3: performance



(a) RP (b) SCG

Figure 4: accuracy

Table 2: accuracy of two algorithm

algorithm	test1	test2	test3	test4	test5	average
RP	97.78%	100%	97.78%	97.78%	95.56%	97.78%
SCG	97.78%	95.56%	100%	100%	97.78%	98.22%

2. Wine

Table 3: parameters of wine

	Epoch	Learning rate	first hidden	second hidden
HW2	30	0.1	4	2
toolbox	N/A	0.0015	4	2

(a) results from HW2

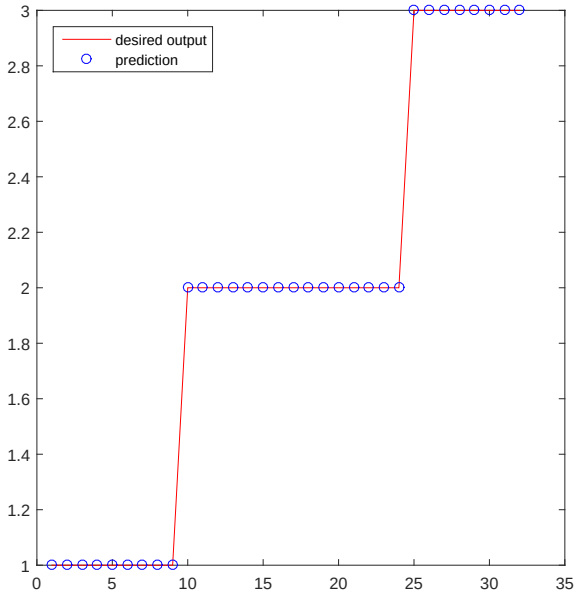
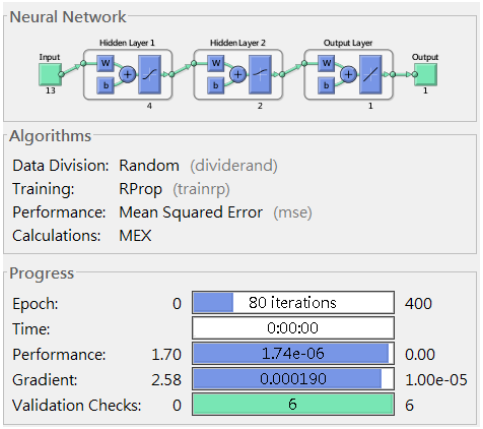
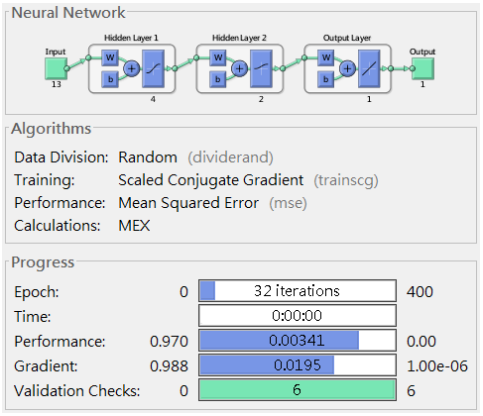


Figure 5: accuracy: 100%

(b) results from toolbox

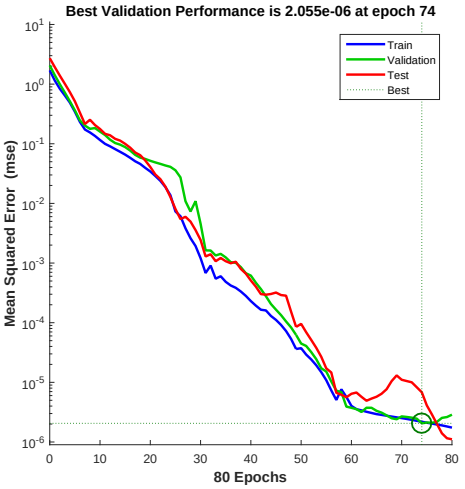


(a) RP

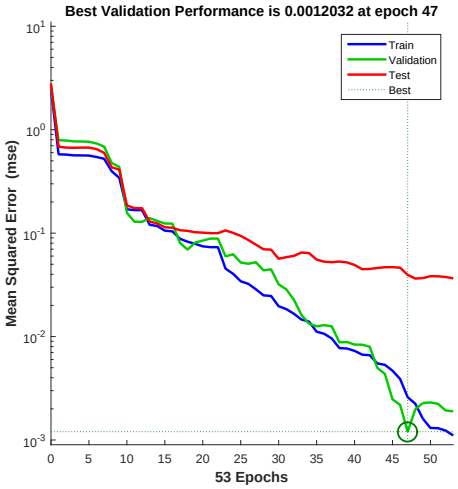


(b) SCG

Figure 6: Sturctures & Parameters

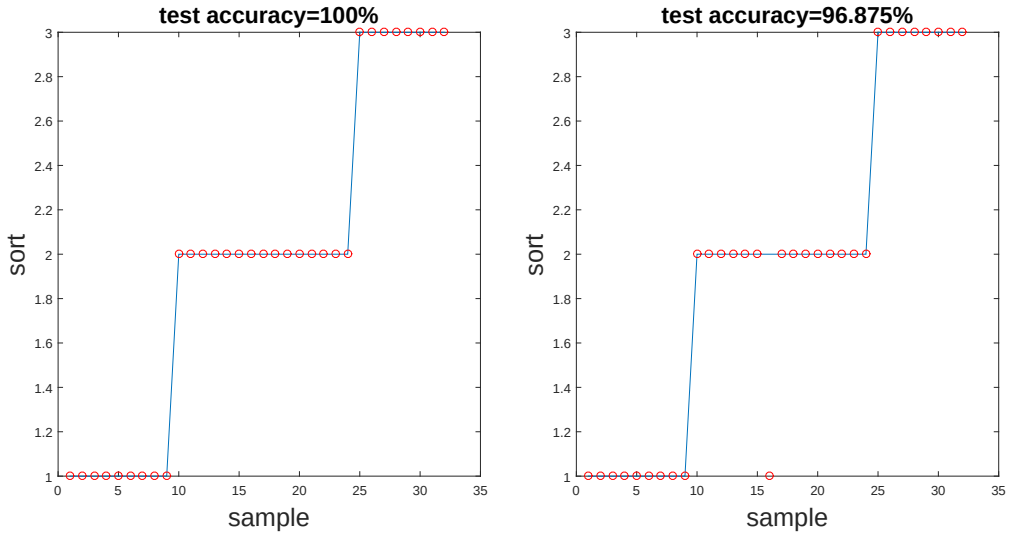


(a) RP



(b) SCG

Figure 7: performance



(a) RP (b) SCG

Figure 8: accuracy

Table 4: accuracy of two algorithm

algorithm	test1	test2	test3	test4	test5	average
RP	96.88%	96.88%	96.88%	96.88%	100%	97.50%
SCG	96.88%	93.75%	100%	100%	100%	98.13%

3. Breast

Table 5: parameters of breast

	Epoch	Learning rate	first hidden	second hidden
HW2	20	0.1	3	3
toolbox	N/A	0.0015	3	3

(a) results from HW2

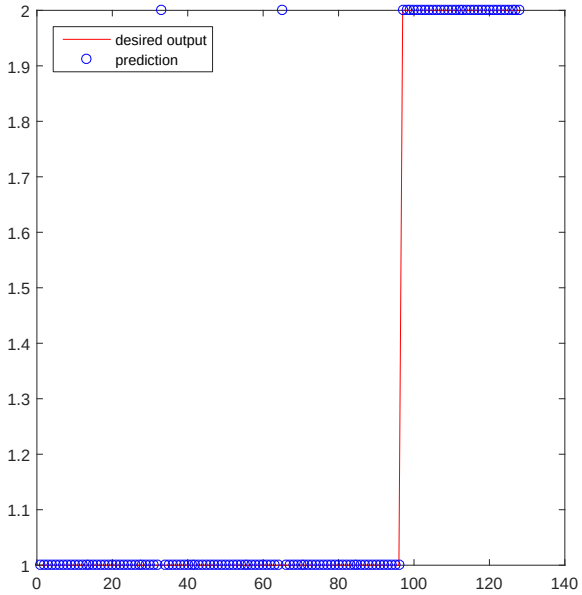
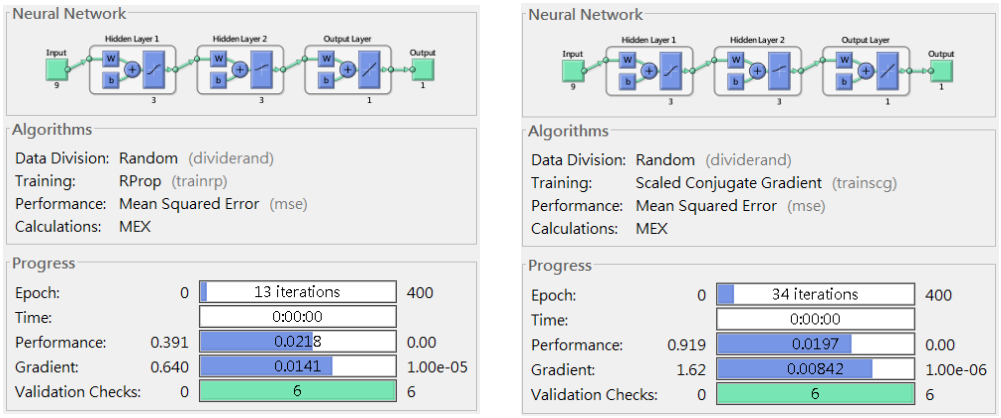


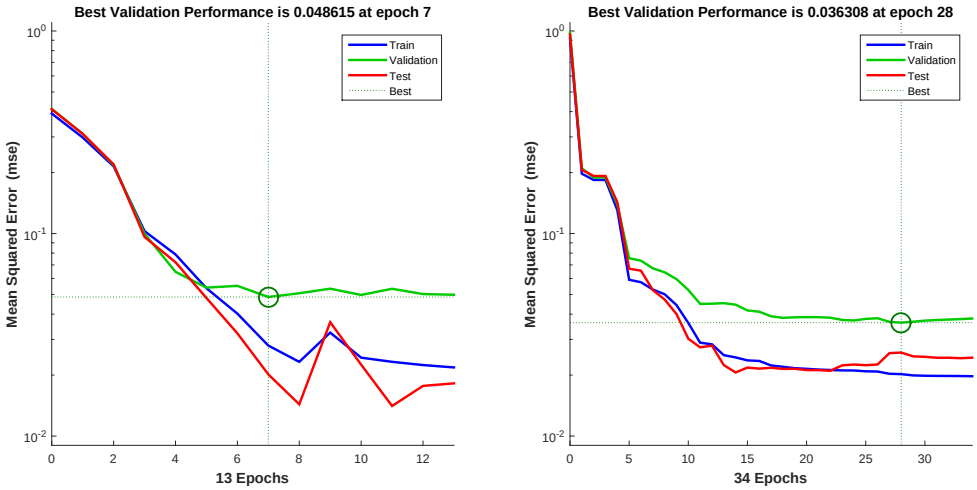
Figure 9: accuracy: 98.4%

(b) results from toolbox



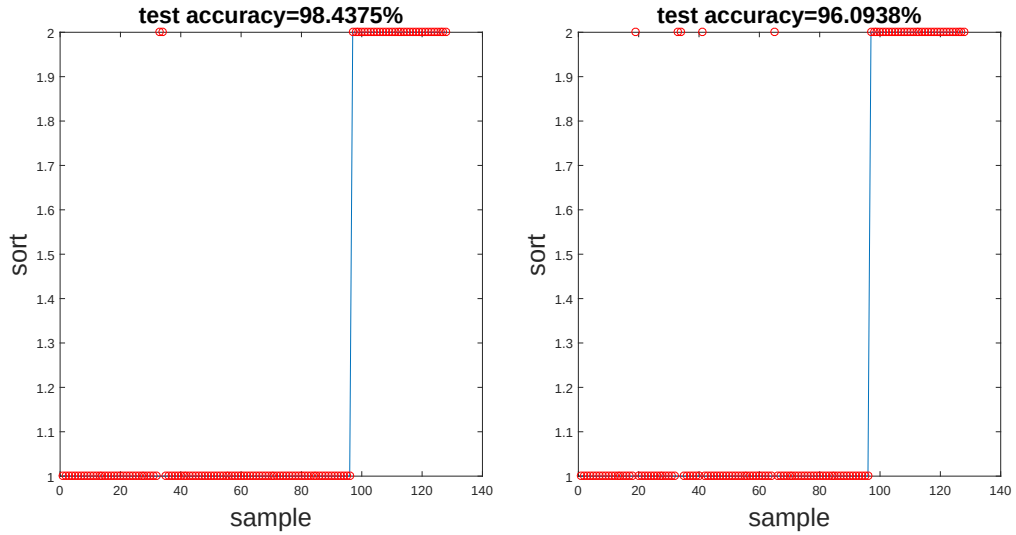
(a) RP (b) SCG

Figure 10: Sturctures & Parameters



(a) RP (b) SCG

Figure 11: performance



(a) RP (b) SCG

Figure 12: accuracy

Table 6: accuracy of two algorithm

algorithm	test1	test2	test3	test4	test5	average
RP	98.44%	94.53%	97.66%	99.22%	98.44%	97.66%
SCG	96.88%	96.88%	96.09%	96.09%	96.88%	96.41%

4. Yeast

Table 7: parameters of yeast

	Epoch	Learning rate	first hidden	second hidden
HW2	500	0.1	5	7
toolbox	N/A	0.0015	5	7

(a) results from HW2

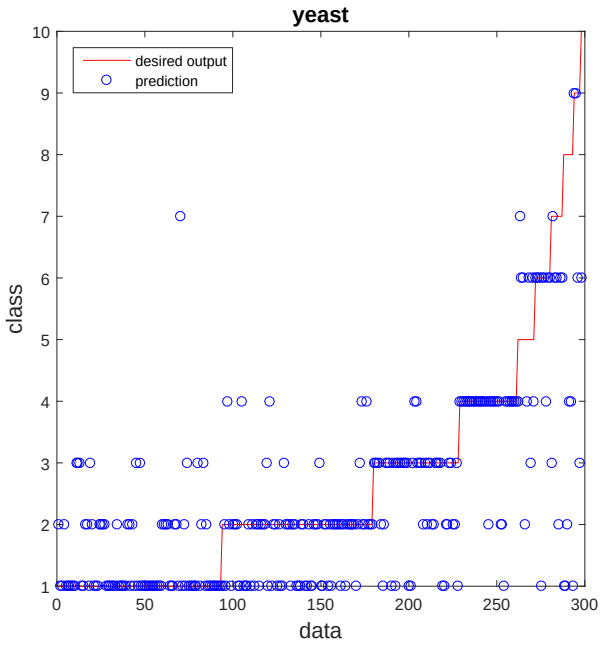
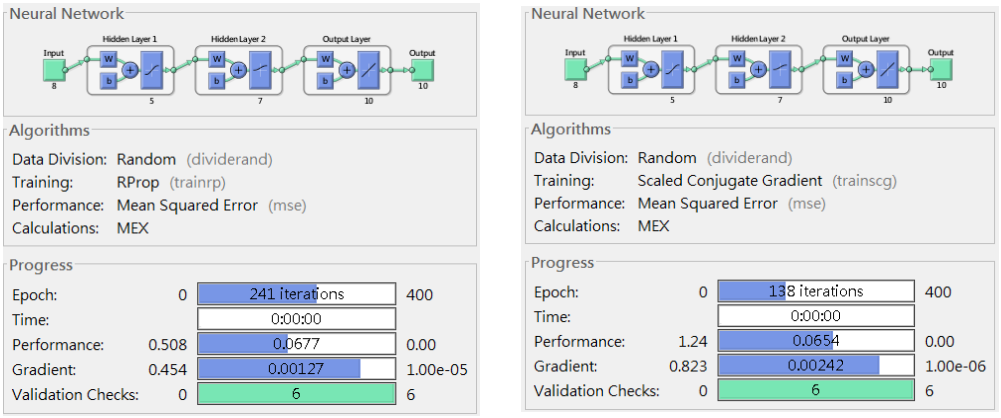


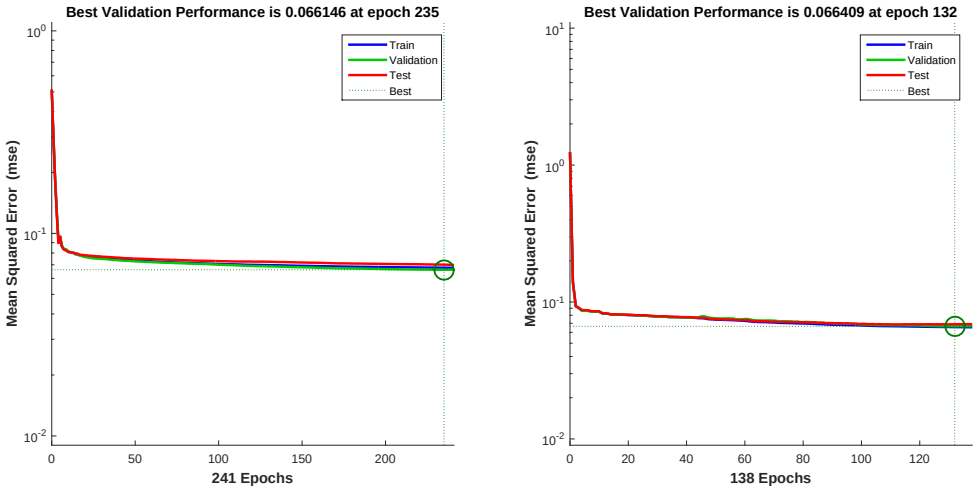
Figure 13: accuracy: 58.4%

(b) results from toolbox



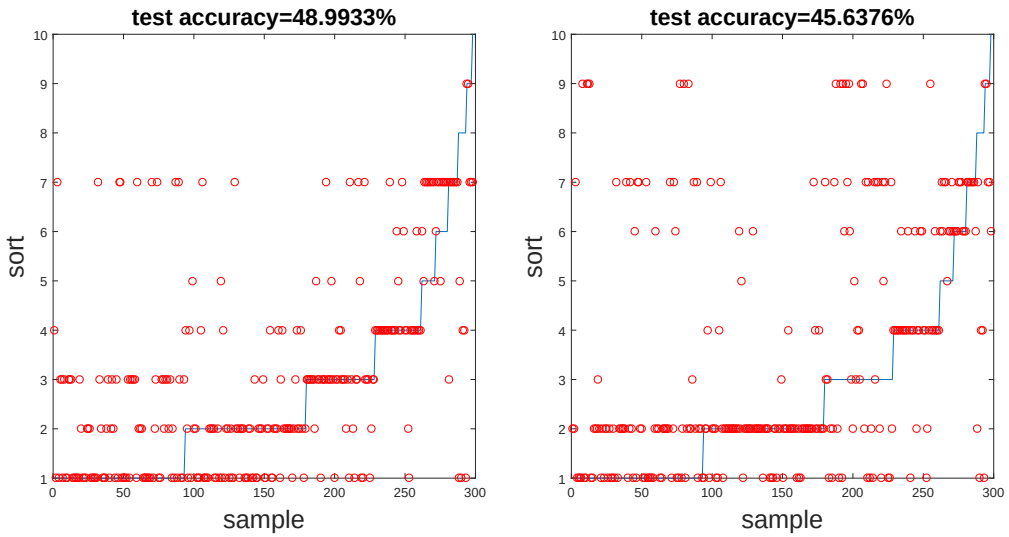
(a) RP (b) SCG

Figure 14: Sturctures & Parameters



(a) RP (b) SCG

Figure 15: performance



(a) RP (b) SCG

Figure 16: accuracy

Table 8: accuracy of two algorithm

algorithm	test1	test2	test3	test4	test5	average
RP	48.99%	43.62%	45.64%	47.65%	45.64%	46.31%
SCG	45.64%	40.27%	41.95%	52.01%	41.28%	44.23%

Discussion

I use Resillent Backpropagation and Scaled Conjugate Gradient for all four data sets. I find that these two algorithms works. The two algorithms have similar accuracy for all data sets, and both can predict well. In this case, there is no such difference between two algorithms. When comparing toolbox with my code in HW2, there is still no difference more than 5%.