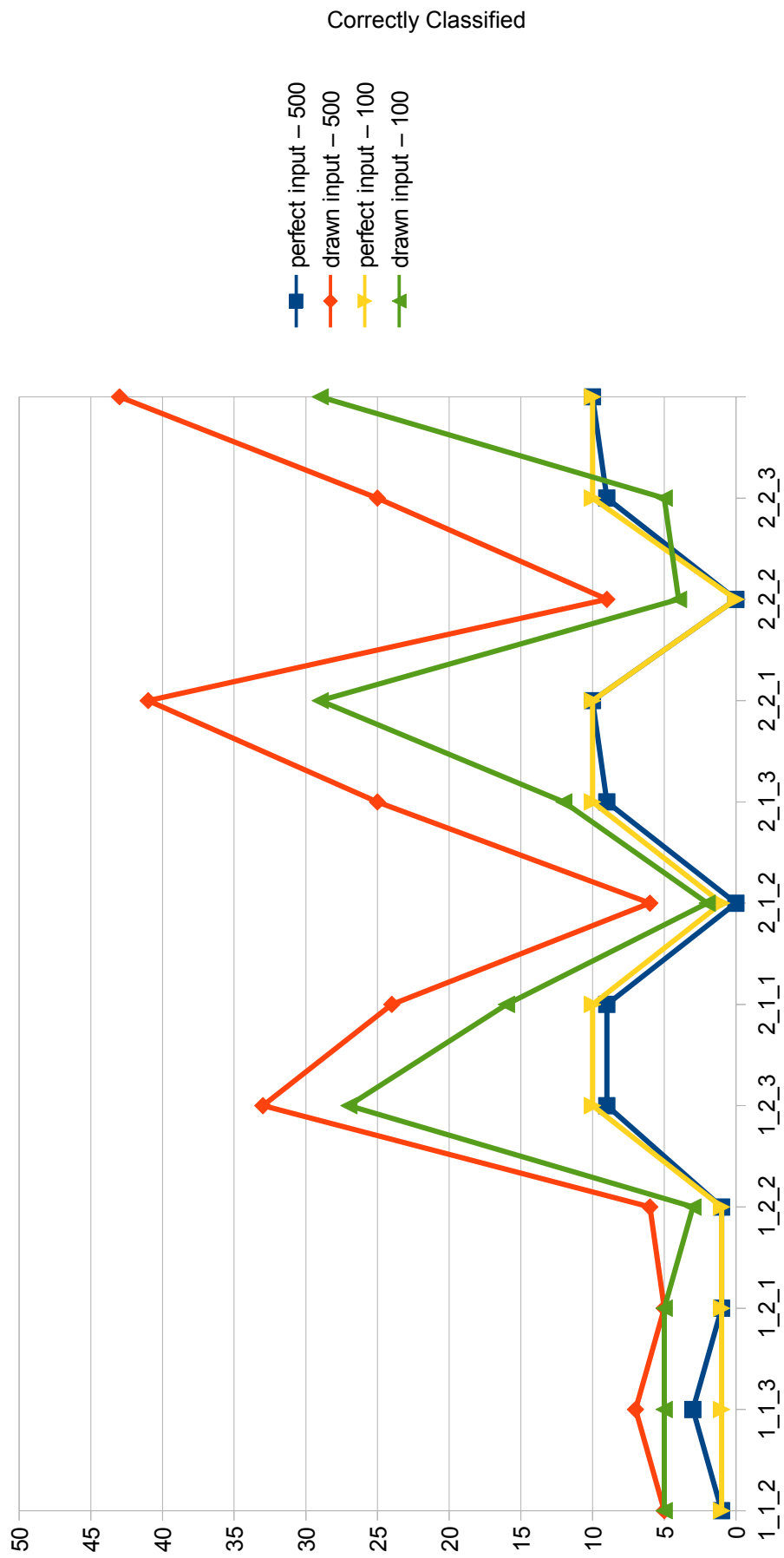Correctly Classified

Correctly Classified

case	perfect input – 500	drawn input – 500	perfect input – 100	drawn input – 100
1_1_1	1	5	1	5
1_1_2	3	7	1	5
1_1_3	1	5	1	5
1_2_1	1	6	1	3
1_2_2	9	33	10	27
1_2_3	9	24	10	16
2_1_1	0	6	1	2
2_1_2	9	25	10	12
2_1_3	10	41	10	29
2_2_1	0	9	0	4
2_2_2	9	25	10	5
2_2_3	10	43	10	29

Correctly Classified

Correctly Classified

Legend:
- perfect input – 500
- drawn input – 500
- perfect input – 100
- drawn input – 100

X-axis labels: 1_1_2, 1_1_3, 1_2_1, 1_2_2, 1_2_3, 2_1_1, 2_1_2, 2_1_3, 2_2_1, 2_2_2, 2_2_3

Y-axis: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Hebb vs Linear

Linear Neuron

case	500 LN – perfect input	500 LN – drawn input	100 LN – perfect input	100 LN – drawn input
1_1_1	1	5	1	5
1_1_2	3	7	1	5
1_1_3	1	5	1	5
2_1_1	0	6	1	2
2_1_2	9	25	10	12
2_1_3	10	41	10	29

Hebb's Rule

case	500 HR – perfect input	500 HR – drawn input	100 HR – perfect input	100 HR – drawn input
1_2_1	1	6	1	3
1_2_2	9	33	10	27
1_2_3	9	24	10	16
2_2_1	0	9	0	4
2_2_2	9	25	10	5
2_2_3	10	43	10	29

1_X_1
1_X_2
1_X_3
2_X_1
2_X_2
2_X_3

Hebb vs Linear

Perfect Input with 500 training cases

Hebb's Rule vs Linear Neuron

Legend:
- HR – perfect input
- LN – perfect input
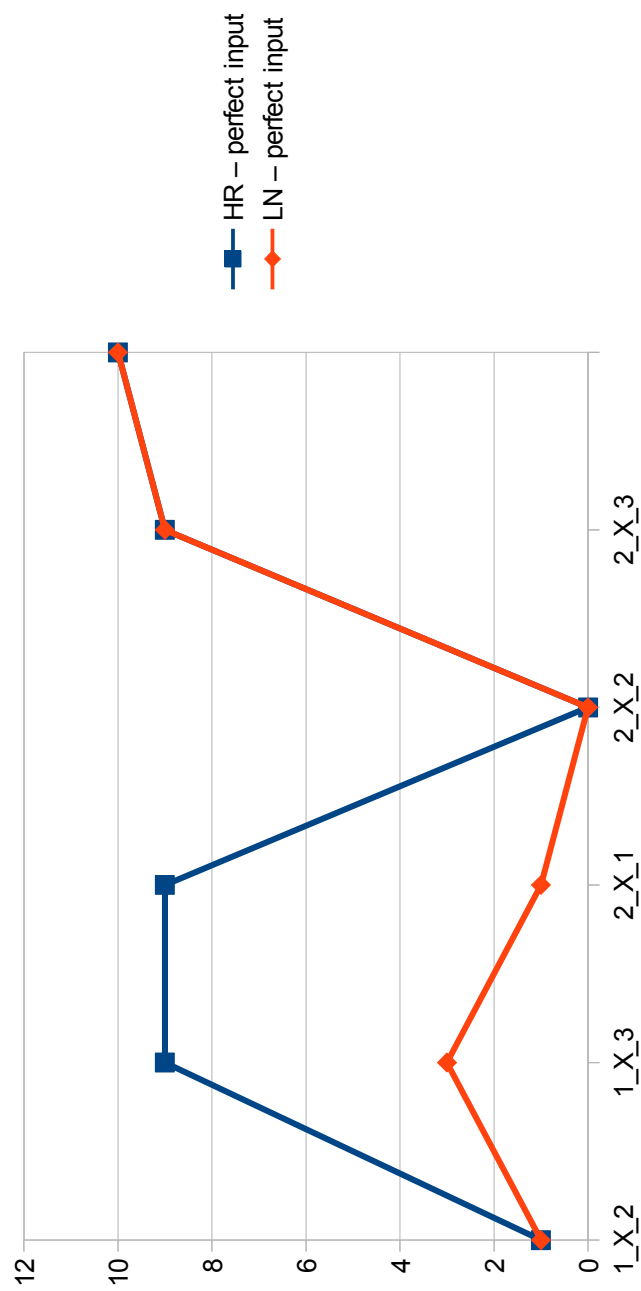
Perfect Input with 100 training cases

Hebb's Rule vs Linear Neuron

Legend:
- HR - perfect input
- LN - perfect input

X-axis: 1_X_2, 1_X_3, 2_X_1, 2_X_2, 2_X_3

Y-axis: 0, 2, 4, 6, 8, 10, 12

Drawn Input with 500 training cases
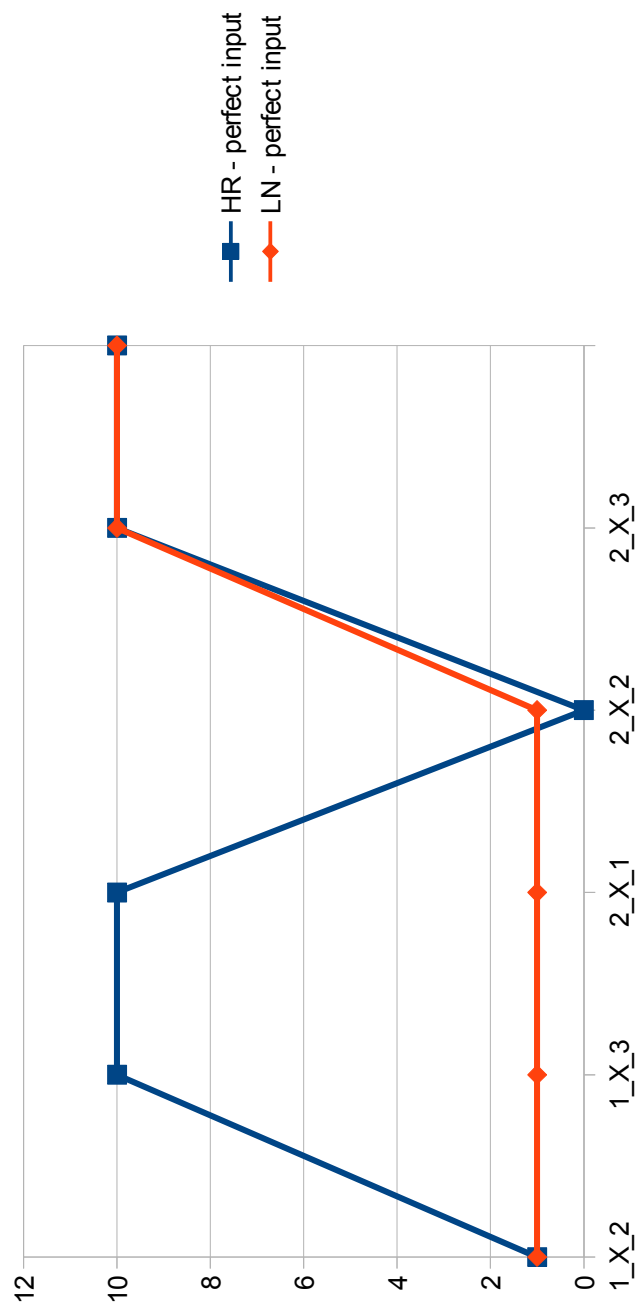
Hebb's Rule vs Linear Neuron

HR - drawn input

LN - drawn input
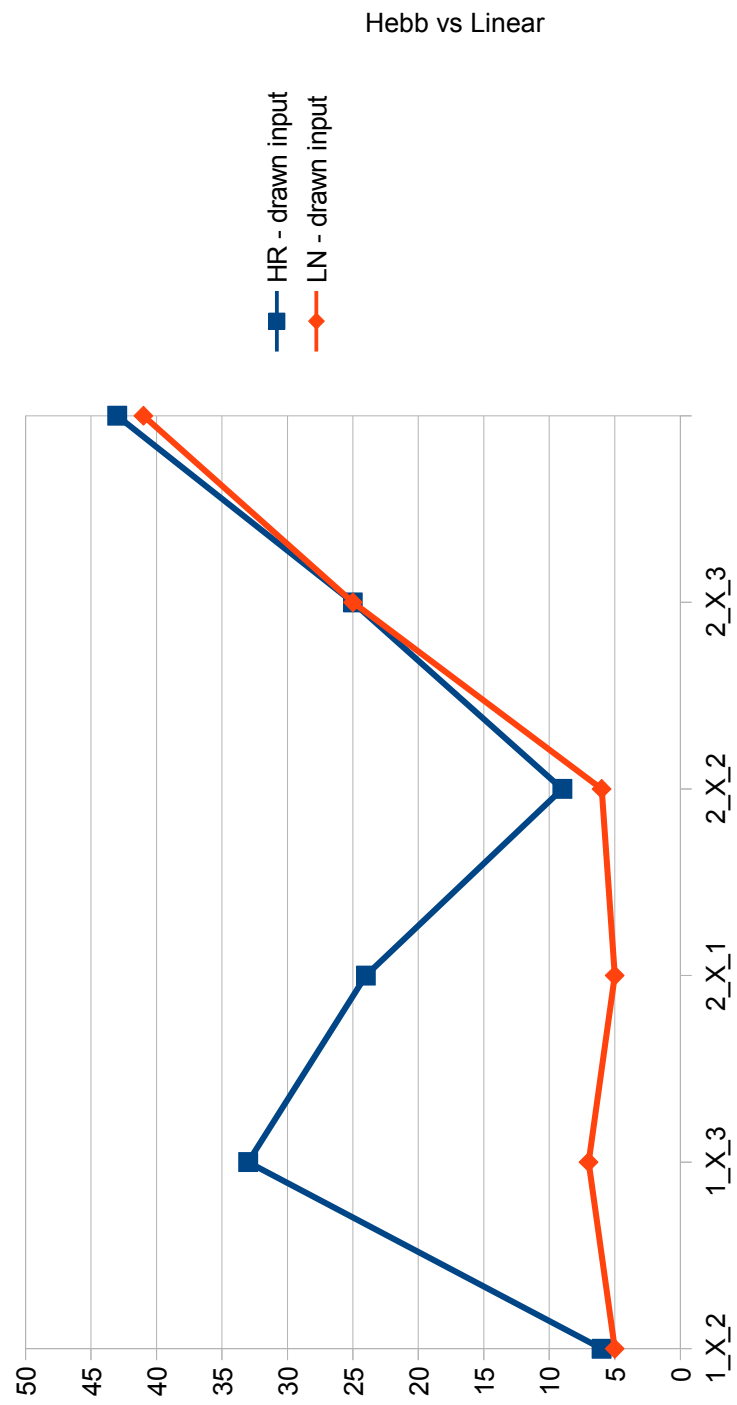
Hebb vs Linear

Drawn Input with 100 training cases

Hebb's Rule vs Linear Neuron

HR - drawn input
LN - drawn input
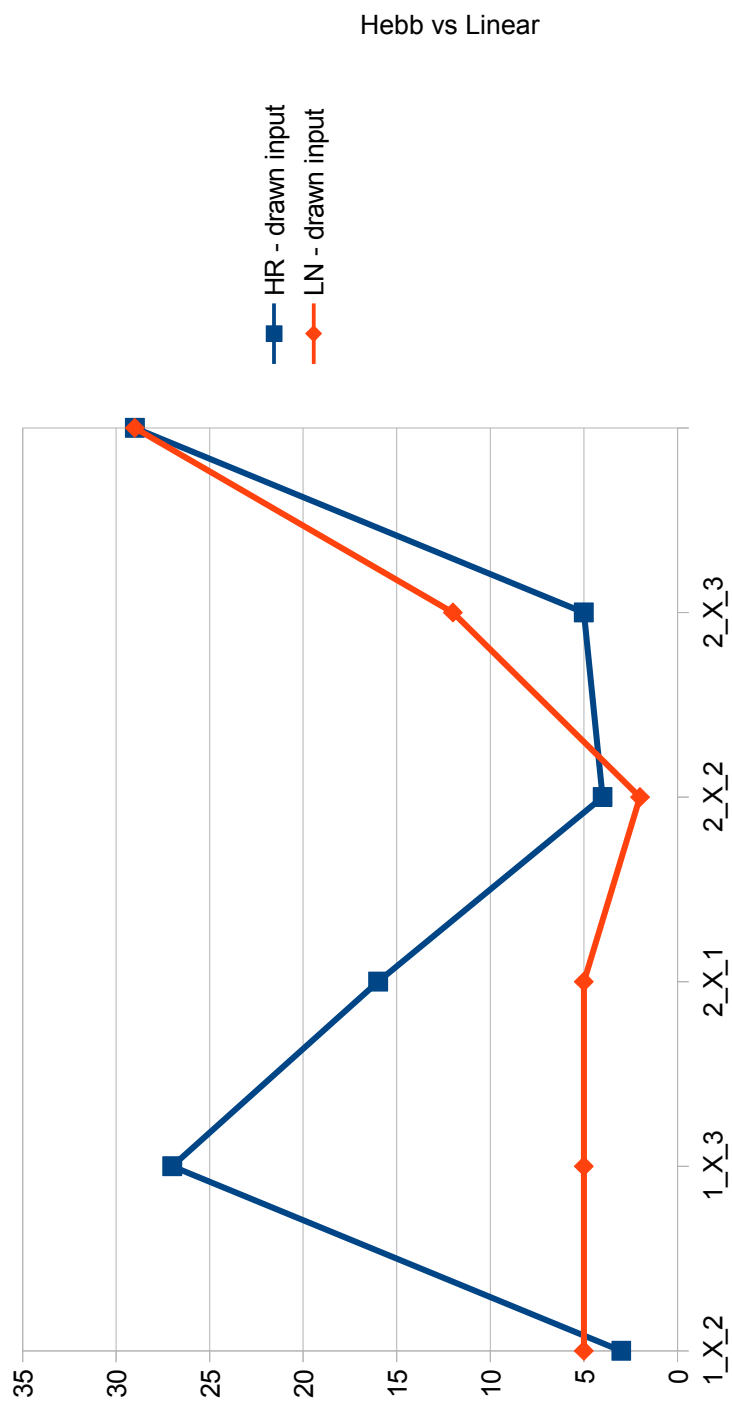
Time

case	perfect input – 500	drawn input – 500	perfect input – 100	drawn input – 100
1_1_1	00:10:38	00:10:04	00:02:21	00:02:27
1_1_2	00:10:52	00:10:16	00:01:28	00:01:21
1_1_3	00:00:15	00:00:13	00:00:00	00:00:01
1_2_1	00:10:21	00:10:02	00:02:22	00:02:21
1_2_2	00:10:02	00:10:30	00:01:30	00:01:23
1_2_3	00:00:12	00:00:13	00:00:01	00:00:00
2_1_1	00:10:06	00:10:45	00:02:24	00:02:15
2_1_2	00:10:16	00:10:39	00:01:27	00:01:22
2_1_3	00:00:12	00:00:13	00:00:01	00:00:00
2_2_1	00:10:25	00:10:46	00:02:38	00:02:18
2_2_2	00:10:16	00:10:22	00:01:33	00:01:20
2_2_3	00:00:14	00:00:11	00:00:01	00:00:01

Time

Legend
- perfect input – 500 ■
- drawn input – 500 ◆
- perfect input – 100 ▼
- drawn input – 100 ◀

Time

x-axis labels
1_1_2
1_1_3
1_2_1
1_2_2
1_2_3
2_1_1
2_1_2
2_1_3
2_2_1
2_2_2
2_2_3

y-axis labels
00:11:31
00:10:05
00:08:38
00:07:12
00:05:46
00:04:19
00:02:53
00:01:26
00:00:00
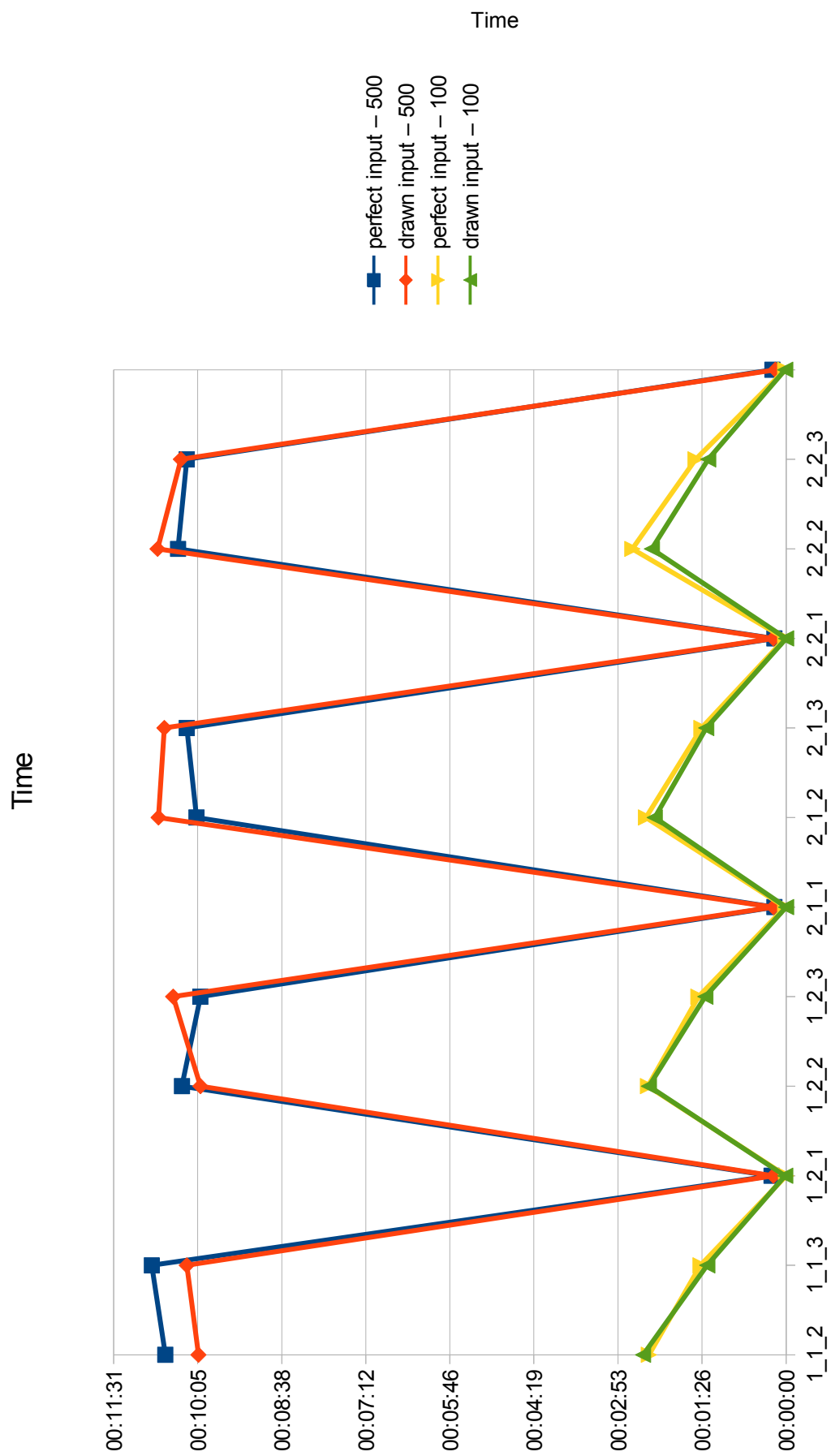
Epochs

case	perfect input – 500	drawn input – 500	perfect input – 100	drawn input – 100
1_1_1	1000	1000	1000	1000
1_1_2	1000	1000	600	590
1_1_3	33	34	9	11
1_2_1	1000	1000	1000	1000
1_2_2	1000	1000	602	600
1_2_3	31	31	13	10
2_1_1	1000	1000	1000	1000
2_1_2	1000	1000	596	596
2_1_3	30	32	11	10
2_2_1	1000	1000	1000	1000
2_2_2	1000	1000	601	577
2_2_3	35	30	12	12

Epochs
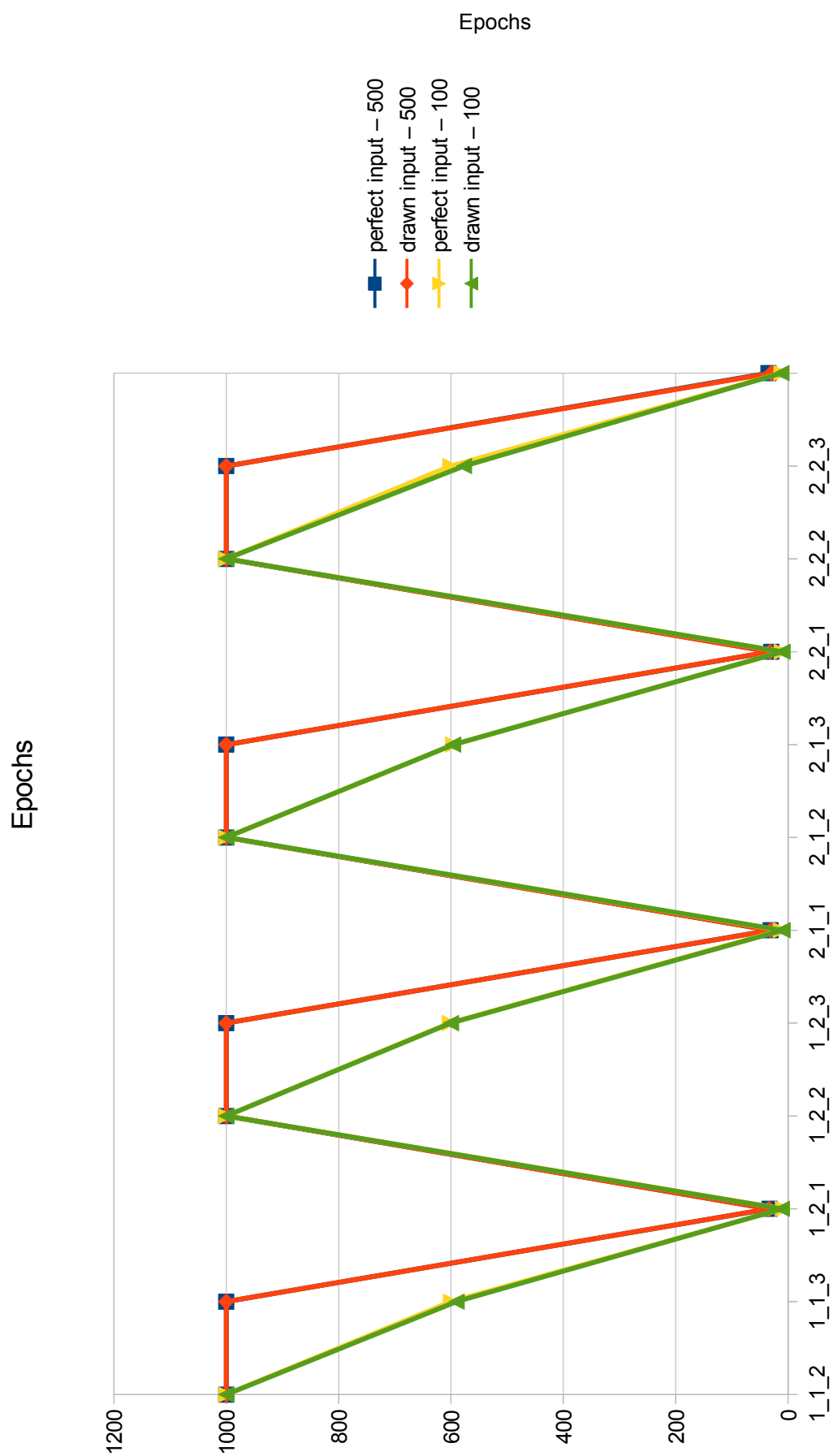
Performance

case	perfect input – 500	drawn input – 500	perfect input – 100	drawn input – 100
1_1_1	4580	4580	990	990
1_1_2	275	275	0,000000994	0,00000099
1_1_3	0	0	0	0
1_2_1	4120	4160	990	990
1_2_2	274	275	0,000000991	0,000000998
1_2_3	0	0	0	0
2_1_1	4580	4130	990	990
2_1_2	274	275	0,000000995	0,000000985
2_1_3	0	0	0	0
2_2_1	4130	4580	990	990
2_2_2	274	275	0,000000985	0,000000996
2_2_3	0	0	0	0
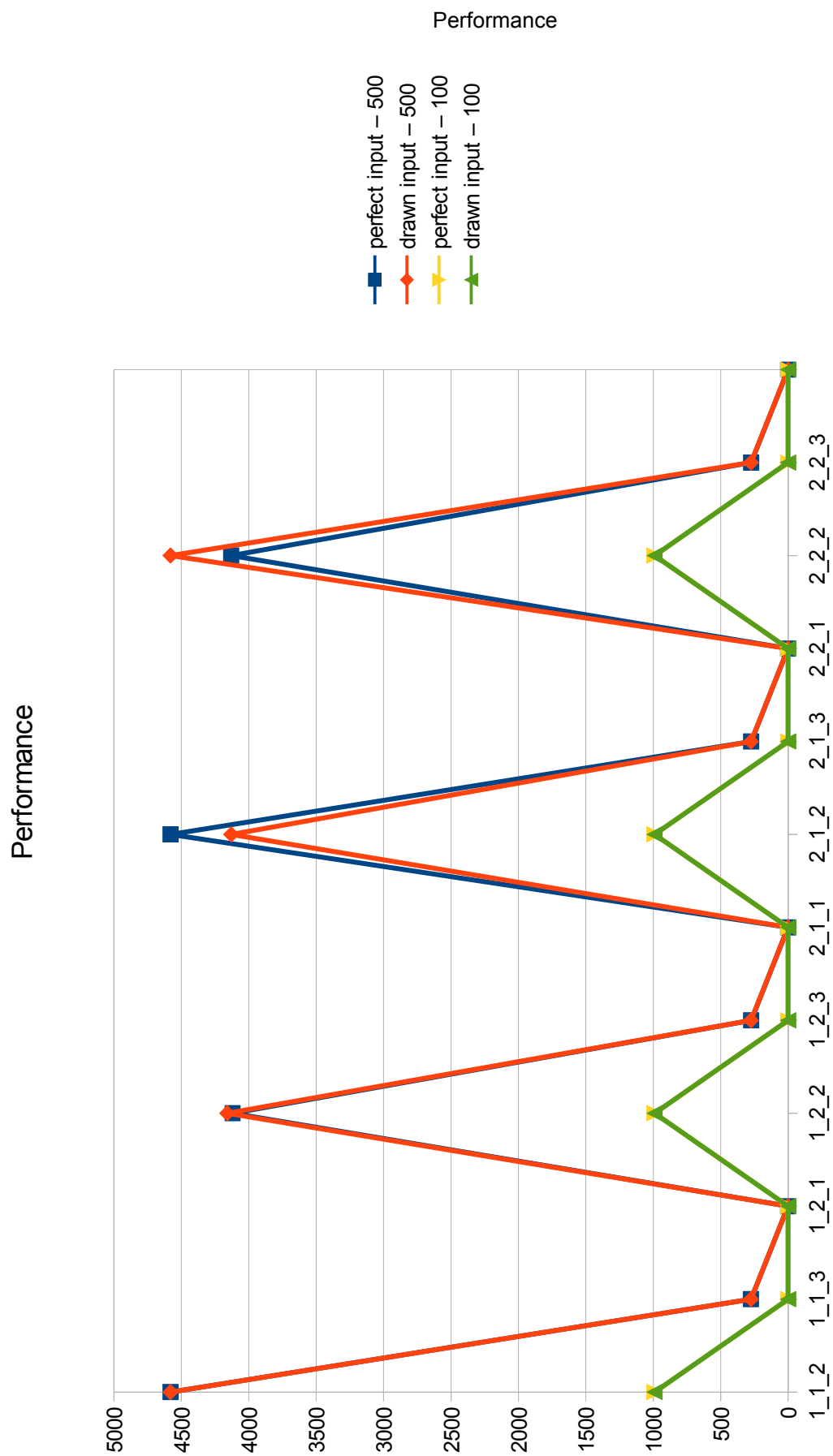
Performance

Everything combined

case	Perfect input - 500 training cases			
	Correctly Classified	Epochs	Time	Performance
1_1_1	1	1000	00:10:38	4580
1_1_2	3	1000	00:10:52	275
1_1_3	1	33	00:00:15	0
1_2_1	1	1000	00:10:21	4120
1_2_2	9	1000	00:10:02	274
1_2_3	9	31	00:00:12	0
2_1_1	0	1000	00:10:06	4580
2_1_2	9	1000	00:10:16	274
2_1_3	10	30	00:00:12	0
2_2_1	0	1000	00:10:25	4130
2_2_2	9	1000	00:10:16	274
2_2_3	10	35	00:00:14	0

case	Perfect input – 100 training cases			
	Correctly Classified	Epochs	Time	Performance
1_1_1	1	1000	00:02:21	990
1_1_2	1	600	00:01:28	0,000000994
1_1_3	1	9	00:00:00	0
1_2_1	1	1000	00:02:22	990
1_2_2	10	602	00:01:30	0,000000991
1_2_3	10	13	00:00:01	0
2_1_1	1	1000	00:02:24	990
2_1_2	10	596	00:01:27	0,000000995
2_1_3	10	11	00:00:01	0
2_2_1	0	1000	00:02:38	990
2_2_2	10	601	00:01:33	0,000000985
2_2_3	10	12	00:00:01	0

Everything combined

case	Drawn input - 500 training cases			
	Correctly Classified	Epochs	Time	Performance
1_1_1	5	1000	00:10:04	4580
1_1_2	7	1000	00:10:16	275
1_1_3	5	34	00:00:13	0
1_2_1	6	1000	00:10:02	4160
1_2_2	33	1000	00:10:30	275
1_2_3	24	31	00:00:13	0
2_1_1	6	1000	00:10:45	4130
2_1_2	25	1000	00:10:39	275
2_1_3	41	32	00:00:13	0
2_2_1	9	1000	00:10:46	4580
2_2_2	25	1000	00:10:22	275
2_2_3	43	30	00:00:11	0

case	Drawn input - 100 training cases			
	Correctly Classified	Epochs	Time	Performance
1_1_1	5	1000	00:02:27	990
1_1_2	5	590	00:01:21	0,00000099
1_1_3	5	11	00:00:01	0
1_2_1	3	1000	00:02:21	990
1_2_2	27	600	00:01:23	0,000000998
1_2_3	16	10	00:00:00	0
2_1_1	2	1000	00:02:15	990
2_1_2	12	596	00:01:22	0,000000985
2_1_3	29	10	00:00:00	0
2_2_1	4	1000	00:02:18	990
2_2_2	5	577	00:01:20	0,000000996
2_2_3	29	12	00:00:01	0