```
Trial>> gen_k_folds('data',5)
nn1h_k_folds
'data'
5
Filename root of the folds (use single quotes): Number of folds: k = Number of neurons↙
at the hidden layer (nonlinear units) = 'data'
(1) Generate w10 and w20, and save
(2) Copy existing w10 and w20
(3) Copy existing w1 and w2
Type of weight generation: 1
Fold = 1
Number of input-output patterns (training) = 48000
Number of input-output patterns (validation) = 12000
Error using rand
Size inputs must be numeric.
Error in init_k_folds (line 16)
        w1 = -0.1 + 0.2*rand(n_hid,n_in+1);
Error in nn1h_k_folds (line 60)
    [w1,w2,eq,CERv,stw1,stw2,rms_w,CER_min,n_iter_v,n_iter,n_itermax,↙
error_per_class_v]
    = init_k_folds(n_in,n,n_out,fold,resp);
Trial>> nn1h_k_folds
Filename root of the folds (use single quotes): 'data'
Number of folds: k = 5
Number of neurons at the hidden layer (nonlinear units) = 130
(1) Generate w10 and w20, and save
(2) Copy existing w10 and w20
(3) Copy existing w1 and w2
Type of weight generation: 1
Fold = 1
Number of input-output patterns (training) = 48000
Number of input-output patterns (validation) = 12000
Maximum number of iterations = 300
Number of inputs = 784
Number of weights in the neural network = 103360
Initial CER (validation) = 0.90369425655
     2  1 32305.5684013
     3  2 25095.3337857
     4  3 19344.7874939
     5  4 18329.9655635
     6  5 15317.7216225
     7  6 14266.4765995
     8  7 13496.3087919
     9  8 12648.1129658
    10  9 12431.5451943
    11 10 11986.6978232
    12 11 11620.1312395
    13 12 11435.6773614
    14 13 11175.9039327
    15 14 10964.9070724
    16 15 10802.4585444
    17 16 10639.9797443
    18 17 10482.5766088
    19 18 10359.4274259
    20 19 10254.5401879
    21 20 10116.0521392
    22 21 9976.72904009
    23 22 9860.97009592
    24 23 9757.18218292
    25 24 9656.69764933
    26 25 9550.72330994
    27 26 9471.89711191
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28 27 9413.85846557
29 28 9337.03329004
30 29 9232.82568529
31 30 9147.32760353
32 31 9075.43115997
33 32 8978.82511032
34 33 8850.61944839
35 34 8753.31700442
36 35 8693.27320723
37 36 8629.47763998
38 37 8526.33629526
39 38 8419.76544913
40 39 8347.62655506
41 40 8285.01415948
42 41 8192.38523376
43 42 8057.56897881
44 43 7939.73677314
45 44 7872.59281172
46 45 7823.77998175
47 46 7741.71429169
48 47 7615.57283922
49 48 7519.21656497
50 49 7471.34188604
51 50 7427.52116876
52 51 7358.74019462
53 52 7254.70767537
54 53 7178.76968176
55 54 7140.36263204
56 55 7114.23270308
57 56 7068.24239604
58 57 6977.0885198
59 58 6897.42538235
60 59 6859.966884
61 60 6834.60942623
62 61 6780.34852648
63 62 6670.6459106
64 63 6584.79230042
65 64 6554.41534512
66 65 6535.88647864
67 66 6499.74632924
68 67 6418.29793327
69 68 6343.78906462
70 69 6314.65104764
71 70 6297.8813578
72 71 6265.2478434
73 72 6182.44591094
74 73 6105.28926855
75 74 6078.20571824
76 75 6064.14977669
77 76 6032.47406077
78 77 5948.13952389
79 78 5884.28135972
80 79 5864.00208512
81 80 5849.4386315
82 81 5810.58291802
83 82 5727.92919537
84 83 5682.44461653
85 84 5667.83506532
86 85 5653.29866266
87 86 5607.82928035
88 87 5542.36239693
89 88 5516.80921303
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 90  89 5505.36601432
 91  90 5478.89778321
 92  91 5405.98676644
 93  92 5359.91946145
 94  93 5347.79483732
 95  94 5336.58916116
 96  95 5295.30523576
 97  96 5231.56742433
 98  97 5210.50537052
 99  98 5202.0342097
100  99 5179.38653081
101 100 5119.24744156
102 101 5087.09220115
103 102 5078.6405026
104 103 5064.65107719
105 104 5013.32243302
106 105 4970.24622924
107 106 4959.61530489
108 107 4950.63559097
109 108 4914.71807325
110 109 4868.5633583
111 110 4854.76264761
112 111 4846.45879484
113 112 4816.01894244
114 113 4759.72661958
115 114 4742.04652855
116 115 4735.37592967
117 116 4714.79972228
118 117 4658.56292647
119 118 4636.08453334
120 119 4629.78701275
121 120 4612.72697411
122 121 4561.99654719
123 122 4536.7580663
124 123 4530.63378852
125 124 4516.34661513
126 125 4467.03856867
127 126 4444.4696377
128 127 4439.13629855
129 128 4427.0170995
130 129 4382.79698492
131 130 4362.56652342
132 131 4357.92429637
133 132 4344.60496143
134 133 4301.48437937
135 134 4283.07193468
136 135 4277.87684672
137 136 4258.9152446
138 137 4207.90052455
139 138 4191.71488958
140 139 4186.54307723
141 140 4167.45090002
142 141 4125.89562965
143 142 4114.5586516
144 143 4110.25285801
145 144 4090.79338059
146 145 4049.25832146
147 146 4038.28370925
148 147 4034.27839138
149 148 4015.40999864
150 149 3981.08868094
151 150 3973.44460149
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152 151 3968.9006355
153 152 3944.96121025
154 153 3919.50246015
155 154 3914.99584023
156 155 3909.15300555
157 156 3880.2280773
158 157 3863.14104896
159 158 3859.84727705
160 159 3850.04657543
161 160 3813.26554951
162 161 3800.36603042
163 162 3797.01859813
164 163 3782.11550862
165 164 3751.00017573
166 165 3744.20612386
167 166 3740.3174744
168 167 3717.1739577
169 168 3693.49828328
170 169 3689.49857535
171 170 3683.1435189
172 171 3652.84084461
173 172 3637.32241019
174 173 3634.25025286
175 174 3623.32191138
176 175 3592.08344561
177 176 3584.02984229
178 177 3581.33595583
179 178 3566.57986192
180 179 3544.38771368
181 180 3540.79372142
182 181 3537.06140165
183 182 3514.31697417
184 183 3500.47996307
185 184 3498.03805131
186 185 3489.42853486
187 186 3463.53088989
188 187 3457.13473836
189 188 3454.00650266
190 189 3434.4070146
191 190 3416.32045715
192 191 3413.64368424
193 192 3407.8203522
194 193 3382.93119456
195 194 3374.83435099
196 195 3372.72104881
197 196 3359.98625687
198 197 3336.68648913
199 198 3332.88077687
200 199 3329.76654682
201 200 3309.65065662
202 201 3296.11790614
203 202 3293.91628734
204 203 3286.5897635
205 204 3262.82714173
206 205 3257.06923986
207 206 3254.84700804
208 207 3240.4735978
209 208 3226.27225998
210 209 3224.16632901
211 210 3218.98401402
212 211 3196.55566405
213 212 3189.77762551
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214 213 3188.02518607
215 214 3176.97954135
216 215 3160.31467769
217 216 3157.82352644
218 217 3154.31465074
219 218 3134.49998059
220 219 3126.21704926
221 220 3124.58375611
222 221 3115.34183059
223 222 3098.20970425
224 223 3095.59276665
225 224 3092.3387642
226 225 3073.89475865
227 226 3066.67338608
228 227 3065.15247466
229 228 3055.38395205
230 229 3041.5768858
231 230 3039.83539122
232 231 3036.65334834
233 232 3020.20537058
234 233 3015.13759409
235 234 3013.62548112
236 235 3002.2839915
237 236 2991.32398224
238 237 2989.90296234
239 238 2984.3404038
240 239 2968.97166813
241 240 2966.59627202
242 241 2964.30269378
243 242 2949.1796379
244 243 2943.46532094
245 244 2942.16735433
246 245 2931.75193191
247 246 2920.45591518
248 247 2919.19655909
249 248 2914.41185002
250 249 2901.31851063
251 250 2899.56843944
252 251 2896.94551372
253 252 2883.34919344
254 253 2880.39699256
255 254 2878.87217436
256 255 2866.36599362
257 256 2861.00734753
258 257 2859.93000445
259 258 2850.0478703
260 259 2841.08151535
261 260 2840.02756566
262 261 2832.95647538
263 262 2821.78735091
264 263 2820.63343981
265 264 2815.32508165
266 265 2802.19119108
267 266 2800.78600731
268 267 2797.42110337
269 268 2785.21455104
270 269 2783.590512
271 270 2780.88045498
272 271 2767.65056666
273 272 2765.54684158
274 273 2763.43750551
275 274 2750.24762165
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   276 275 2747.66390092
   277 276 2745.8568941
   278 277 2731.66543342
   279 278 2728.1553236
   280 279 2726.60187664
   281 280 2713.71702198
   282 281 2710.13711626
   283 282 2708.88794605
   284 283 2697.16864125
   285 284 2693.09096107
   286 285 2691.86002485
   287 286 2680.25907118
   288 287 2676.16705462
   289 288 2675.03552021
   290 289 2663.69755064
   291 290 2659.54236726
   292 291 2658.43817042
   293 292 2647.92543081
   294 293 2644.51828745
   295 294 2643.449805
   296 295 2632.68887059
   297 296 2629.43765685
   298 297 2628.23536481
   299 298 2617.29521078
   300 299 2614.71814213
Final mean squared error (training) = 0.104377482847 at iteration 300
Final CER (validation) = 0.0464520968513 at iteration 299
Fold = 2
Number of input-output patterns (training) = 48000
Number of input-output patterns (validation) = 12000
Maximum number of iterations = 300
Initial CER (validation) = 0.920138694643
     2  1 31235.0289648
     3  2 19801.8004303
     4  3 17911.9988306
     5  4 16218.6063551
     6  5 14677.2232114
     7  6 14130.2181027
     8  7 13182.229851
     9  8 12821.7916188
    10  9 12460.8506232
    11 10 12047.1974052
    12 11 11830.6596449
    13 12 11588.6773216
    14 13 11311.2562377
    15 14 11126.2557215
    16 15 10973.2455912
    17 16 10794.8523173
    18 17 10638.1278964
    19 18 10521.8395577
    20 19 10406.2072135
    21 20 10264.2289964
    22 21 10140.9034142
    23 22 10051.967695
    24 23 9957.69027092
    25 24 9846.53932631
    26 25 9754.0767109
    27 26 9688.81147426
    28 27 9615.55039231
    29 28 9515.7521216
    30 29 9431.25151076
    31 30 9366.96362506
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32 31 9296.8445312
33 32 9207.95593648
34 33 9120.22851872
35 34 9051.77872691
36 35 8990.02369907
37 36 8919.83634657
38 37 8824.59509614
39 38 8735.37782775
40 39 8669.37081685
41 40 8607.20602864
42 41 8519.79063212
43 42 8419.11273632
44 43 8346.6320047
45 44 8294.37023858
46 45 8234.67764681
47 46 8138.16589933
48 47 8032.34831309
49 48 7959.58710016
50 49 7905.32743534
51 50 7832.66022378
52 51 7713.10385521
53 52 7603.65433761
54 53 7542.54663635
55 54 7504.96184356
56 55 7447.78113419
57 56 7347.04984268
58 57 7261.88326011
59 58 7222.25373074
60 59 7193.63166728
61 60 7136.76132568
62 61 7035.86377743
63 62 6961.88838426
64 63 6930.83951864
65 64 6903.62553789
66 65 6840.78955906
67 66 6735.32257576
68 67 6673.81724113
69 68 6650.42972372
70 69 6625.97481249
71 70 6561.84992023
72 71 6467.26740642
73 72 6425.23660469
74 73 6407.46898967
75 74 6376.54134816
76 75 6278.65407534
77 76 6164.32599649
78 77 6124.68430057
79 78 6107.45577044
80 79 6070.26567768
81 80 5963.9927789
82 81 5890.64363521
83 82 5868.74130832
84 83 5846.57680831
85 84 5767.39846714
86 85 5653.58022315
87 86 5618.10812994
88 87 5607.09453609
89 88 5580.90449693
90 89 5498.28585749
91 90 5449.0119996
92 91 5437.14147426
93 92 5422.72373079
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 94  93 5360.3859815
 95  94 5293.1549364
 96  95 5277.79535637
 97  96 5268.5365034
 98  97 5227.29409666
 99  98 5155.57322086
100  99 5136.80219337
101 100 5129.27585517
102 101 5099.29147617
103 102 5015.01171886
104 103 4981.68860576
105 104 4974.15966722
106 105 4955.55526309
107 106 4885.97304588
108 107 4846.25701565
109 108 4838.72341287
110 109 4828.6408734
111 110 4779.20352967
112 111 4730.04371306
113 112 4719.05400915
114 113 4711.13556182
115 114 4676.14695696
116 115 4613.40775516
117 116 4595.88681604
118 117 4589.84600553
119 118 4569.40089878
120 119 4501.57389744
121 120 4472.75981993
122 121 4467.33962202
123 122 4456.26094733
124 123 4404.37908176
125 124 4371.18709586
126 125 4366.16509807
127 126 4360.06724954
128 127 4322.38385346
129 128 4283.17958928
130 129 4276.0627265
131 130 4269.7174128
132 131 4233.55298128
133 132 4190.73455978
134 133 4182.74821977
135 134 4176.8829871
136 135 4143.16811688
137 136 4100.46985262
138 137 4092.85580343
139 138 4088.3637524
140 139 4059.94518795
141 140 4018.61337635
142 141 4011.55470344
143 142 4008.30079034
144 143 3987.12472988
145 144 3949.15614719
146 145 3942.0422352
147 146 3938.56294009
148 147 3915.47094579
149 148 3882.04522109
150 149 3876.6409844
151 150 3872.47098023
152 151 3844.36213947
153 152 3819.32341071
154 153 3815.83413266
155 154 3809.89231599
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156 155 3773.00447058
157 156 3753.25868952
158 157 3750.09011199
159 158 3738.55057961
160 159 3702.07048566
161 160 3693.80096189
162 161 3690.98288349
163 162 3669.41093706
164 163 3641.37435227
165 164 3637.97877313
166 165 3633.332077
167 166 3602.67328448
168 167 3589.72173324
169 168 3587.75481118
170 169 3575.28998291
171 170 3548.03255356
172 171 3544.55098906
173 172 3540.82139089
174 173 3513.05826596
175 174 3502.32897514
176 175 3500.31895843
177 176 3483.21518271
178 177 3462.97273015
179 178 3460.90806441
180 179 3452.9025759
181 180 3424.52423032
182 181 3420.56670885
183 182 3417.38817573
184 183 3389.98524333
185 184 3380.20188458
186 185 3378.1333714
187 186 3356.61396579
188 187 3339.84309324
189 188 3338.26655941
190 189 3326.91482818
191 190 3305.89937776
192 191 3303.97906018
193 192 3297.14278807
194 193 3273.75629333
195 194 3271.15891143
196 195 3266.03407523
197 196 3239.9590519
198 197 3236.41884892
199 198 3233.23536234
200 199 3208.81884811
201 200 3204.02093897
202 201 3201.65396078
203 202 3180.59008313
204 203 3175.74586872
205 204 3173.63527777
206 205 3154.54660035
207 206 3150.72358055
208 207 3148.32933548
209 208 3129.93534035
210 209 3127.34950926
211 210 3124.38181407
212 211 3107.72997929
213 212 3106.09115734
214 213 3101.1768914
215 214 3083.67312939
216 215 3082.30227132
217 216 3072.7890375
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218 217 3055.69179572
219 218 3054.41725907
220 219 3038.5485134
221 220 3026.4481917
222 221 3024.85498704
223 222 3005.62239697
224 223 3002.53143522
225 224 2999.92800464
226 225 2988.14991751
227 226 2987.47188026
228 227 2979.72872692
229 228 2973.95743212
230 229 2972.82692478
231 230 2959.26319346
232 231 2957.87301139
233 232 2951.09599879
234 233 2939.6536158
235 234 2938.58064912
236 235 2921.08687318
237 236 2918.50570698
238 237 2912.47224839
239 238 2898.84876755
240 239 2897.86314161
241 240 2882.39045536
242 241 2880.50436714
243 242 2874.17121504
244 243 2864.06048349
245 244 2863.00190918
246 245 2848.74387863
247 246 2847.64307412
248 247 2837.3047929
249 248 2829.05178293
250 249 2826.68940585
251 250 2810.60180363
252 251 2809.77537987
253 252 2795.56599201
254 253 2792.57034733
255 254 2786.35694831
256 255 2774.73506119
257 256 2773.48621871
258 257 2759.1318647
259 258 2758.31377699
260 259 2745.21754787
261 260 2741.23020131
262 261 2736.05025915
263 262 2723.92919422
264 263 2722.75416711
265 264 2709.99403724
266 265 2709.31231119
267 266 2696.95949628
268 267 2694.14692778
269 268 2686.88973372
270 269 2676.89911545
271 270 2675.01342752
272 271 2661.68242893
273 272 2660.97435214
274 273 2647.08267134
275 274 2645.7784472
276 275 2633.94008037
277 276 2627.63782213
278 277 2622.48769453
279 278 2611.12410645
```

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   280 279 2609.91787214
   281 280 2598.35933535
   282 281 2597.7525878
   283 282 2585.4740872
   284 283 2584.11858728
   285 284 2573.19977571
   286 285 2567.73886367
   287 286 2563.18715853
   288 287 2553.25818973
   289 288 2551.87097888
   290 289 2541.85717869
   291 290 2541.28493833
   292 291 2530.45382899
   293 292 2529.64570305
   294 293 2517.95535056
   295 294 2514.881111
   296 295 2506.29710373
   297 296 2497.00283009
   298 297 2493.96239412
   299 298 2481.76775384
   300 299 2480.7041746
Final mean squared error (training) = 0.101667435269 at iteration 300
Final CER (validation) = 0.0504023647166 at iteration 298
Fold = 3
Number of input-output patterns (training) = 48000
Number of input-output patterns (validation) = 12000
Maximum number of iterations = 300
Initial CER (validation) = 0.896501444941
     2  1 30511.9313303
     3  2 25524.9692158
     4  3 18830.2173484
     5  4 17880.534667
     6  5 15204.6739252
     7  6 14271.1350895
     8  7 13675.5863278
     9  8 12615.4093222
    10  9 12425.071941
    11 10 11951.9553046
    12 11 11541.7941007
    13 12 11414.6628397
    14 13 11058.7867909
    15 14 10864.4495913
    16 15 10786.2952204
    17 16 10587.5594761
    18 17 10418.5817964
    19 18 10339.3772988
    20 19 10219.6180067
    21 20 10050.821328
    22 21 9955.13822455
    23 22 9883.37786247
    24 23 9769.56731568
    25 24 9647.58545812
    26 25 9576.53741774
    27 26 9520.57374599
    28 27 9431.48193988
    29 28 9314.35203173
    30 29 9244.44666605
    31 30 9193.26207173
    32 31 9095.75129466
    33 32 8949.0497524
    34 33 8860.33120104
    35 34 8813.13209751
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36 35 8732.69720905
37 36 8588.1026221
38 37 8495.80672204
39 38 8455.52549795
40 39 8399.38807926
41 40 8256.54862831
42 41 8128.14607908
43 42 8076.35963016
44 43 8029.85279028
45 44 7904.8347501
46 45 7743.06032858
47 46 7687.24070504
48 47 7656.00440945
49 48 7562.16192929
50 49 7401.74435234
51 50 7343.49561751
52 51 7310.3303804
53 52 7195.80100684
54 53 7022.595906
55 54 6974.91359042
56 55 6949.91516609
57 56 6830.51165363
58 57 6715.43535961
59 58 6691.76393989
60 59 6644.80737907
61 60 6491.74321266
62 61 6446.73669687
63 62 6424.68926364
64 63 6295.02323632
65 64 6199.25260317
66 65 6180.96771207
67 66 6114.55442714
68 67 5966.97383867
69 68 5932.3947161
70 69 5913.16288309
71 70 5815.62627018
72 71 5722.9125991
73 72 5707.7778342
74 73 5685.33356362
75 74 5582.99389793
76 75 5521.74819757
77 76 5506.57523531
78 77 5469.32854118
79 78 5376.66105451
80 79 5351.53023944
81 80 5341.20763919
82 81 5288.44591009
83 82 5237.38011728
84 83 5228.46400535
85 84 5209.64898935
86 85 5127.07017095
87 86 5090.25049921
88 87 5080.49829381
89 88 5038.00802685
90 89 4963.67092231
91 90 4949.62158006
92 91 4938.03520323
93 92 4879.21883006
94 93 4843.37318826
95 94 4836.53648089
96 95 4813.57734684
97 96 4750.3694487
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 98 97 4733.64408652
 99 98 4724.66704489
100 99 4674.96461433
101 100 4626.51372714
102 101 4618.68083418
103 102 4606.0233281
104 103 4546.20986784
105 104 4513.29758119
106 105 4506.97127483
107 106 4493.40416114
108 107 4441.50079279
109 108 4418.25696368
110 109 4412.55380875
111 110 4389.97635542
112 111 4335.11248388
113 112 4322.50767548
114 113 4317.05429168
115 114 4286.21038935
116 115 4253.48688663
117 116 4248.23629146
118 117 4237.42388848
119 118 4188.11608431
120 119 4170.17527849
121 120 4165.61112353
122 121 4141.87838815
123 122 4095.04527848
124 123 4086.20987848
125 124 4079.48733272
126 125 4041.47445012
127 126 4015.56150519
128 127 4011.15591383
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134 133 3886.17196232
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136 135 3874.22411159
137 136 3843.61708235
138 137 3819.46943437
139 138 3816.02273809
140 139 3807.56664504
141 140 3774.10903469
142 141 3765.41291091
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194 193 3143.97976996
195 194 3140.1858887
196 195 3120.25083326
197 196 3114.49828461
198 197 3113.0772673
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212 211 2993.45111802
213 212 2976.6035313
214 213 2973.39118736
215 214 2971.54406104
216 215 2957.86126669
217 216 2952.31227808
218 217 2951.17244242
219 218 2941.06115732
220 219 2931.51815444
221 220 2930.47596457
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224 223 2912.47856716
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227 226 2893.73934896
228 227 2891.2792487
229 228 2876.29412369
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231 230 2871.11431258
232 231 2856.92970879
233 232 2852.08826931
234 233 2850.90041069
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244 243 2791.64019609
245 244 2785.06320803
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251 250 2752.78769222
252 251 2751.87239807
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261 260 2700.38756404
262 261 2688.93084163
263 262 2685.83971576
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266 265 2671.73692684
267 266 2670.05758025
268 267 2660.36100686
269 268 2659.21672034
270 269 2656.47117842
271 270 2646.79570757
272 271 2645.8999164
273 272 2640.65122255
274 273 2631.89236731
275 274 2631.18798105
276 275 2623.89956582
277 276 2618.04758139
278 277 2617.23776414
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281 280 2603.68571401
282 281 2594.43454712
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  292 291 2557.86296649
  293 292 2547.82571998
  294 293 2546.82862094
  295 294 2542.94423932
  296 295 2535.68779704
  297 296 2535.04292887
  298 297 2526.61785446
  299 298 2523.0901601
  300 299 2521.78536161
Final mean squared error (training) = 0.102505799869 at iteration 300
Final CER (validation) = 0.0455804173238 at iteration 296
Fold = 4
Number of input-output patterns (training) = 48000
Number of input-output patterns (validation) = 12000
Maximum number of iterations = 300
Initial CER (validation) = 0.891746269363
    2 1 30295.339467
    3 2 25202.1350893
    4 3 18271.4632233
    5 4 17146.8984559
    6 5 15323.2189673
    7 6 14107.3882486
    8 7 13743.640127
    9 8 12821.8119098
   10 9 12421.1453357
   11 10 12210.6271046
   12 11 11789.6690734
   13 12 11556.3239729
   14 13 11414.586696
   15 14 11136.6557914
   16 15 10915.3612356
   17 16 10795.4387119
   18 17 10662.5994574
   19 18 10502.6421855
   20 19 10393.8539871
   21 20 10316.1725076
   22 21 10206.3957835
   23 22 10063.1143054
   24 23 9957.21490966
   25 24 9888.81047027
   26 25 9789.37920155
   27 26 9651.84806913
   28 27 9566.43896039
   29 28 9517.03821764
   30 29 9440.68743603
   31 30 9301.92247543
   32 31 9204.75497168
   33 32 9157.09890918
   34 33 9103.30581424
   35 34 8995.77819376
   36 35 8883.19558264
   37 36 8827.07845179
   38 37 8784.19596505
   39 38 8704.73428906
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 43 42 8347.68755332
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 45 44 8108.61348004
 46 45 8010.91842484
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 53 52 7431.24764942
 54 53 7269.60161934
 55 54 7119.9474733
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 57 56 7048.66465357
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 73 72 6027.25662147
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 75 74 5843.05962788
 76 75 5822.27992315
 77 76 5806.43639779
 78 77 5712.65921225
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 80 79 5623.54296486
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 84 83 5448.02813951
 85 84 5391.97576204
 86 85 5307.12305131
 87 86 5295.0812707
 88 87 5281.0068942
 89 88 5189.70606311
 90 89 5138.39184623
 91 90 5130.76171309
 92 91 5104.51315283
 93 92 5019.03681992
 94 93 4999.59394307
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112 111 4493.25076744
113 112 4455.49734897
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125 124 4177.8491025
126 125 4116.92693988
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135 134 3916.55873371
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184 183 3184.91901376
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  295 294 2349.22547092
  296 295 2338.63488853
  297 296 2335.77266836
  298 297 2330.27007478
  299 298 2323.14873365
  300 299 2321.19248487
Final mean squared error (training) = 0.0983444729185 at iteration 300
Final CER (validation) = 0.04418644108 at iteration 296
Fold = 5
Number of input-output patterns (training) = 48000
Number of input-output patterns (validation) = 12000
Maximum number of iterations = 300
Initial CER (validation) = 0.896131928565
    2 1 29497.6164525
    3 2 23159.7943829
    4 3 17618.0184187
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    6 5 15027.4550298
    7 6 13959.6115939
    8 7 13511.1924606
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   26 25 9730.78952401
   27 26 9672.46212428
   28 27 9539.94126496
   29 28 9418.30998823
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   33 32 9023.23409011
   34 33 8959.5469433
   35 34 8899.04046938
   36 35 8802.01111333
   37 36 8676.72608167
   38 37 8601.80086312
   39 38 8561.42527217
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   42 41 8259.34239185
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248 247 2485.45183722
249 248 2484.53997466
250 249 2472.54204415
251 250 2469.93986092
252 251 2463.68356772
253 252 2455.4919093
254 253 2454.21381314
255 254 2443.65909205
256 255 2442.95027708
257 256 2434.00704396
258 257 2431.67414867
259 258 2426.86723412
260 259 2419.63718565
261 260 2418.55733191
262 261 2409.06426469
263 262 2408.37521299
264 263 2399.4410899
265 264 2396.71007814
266 265 2392.56014152
267 266 2385.05415554
268 267 2384.03921034
269 268 2373.81089491
270 269 2372.964068
271 270 2363.29064699
272 271 2360.10282986
273 272 2356.61503632
274 273 2347.69305492
275 274 2346.76991327
276 275 2336.94705867
277 276 2336.02339286
278 277 2328.14014406
279 278 2324.2176909
280 279 2322.08179326
281 280 2314.40731501
282 281 2313.79215694
283 282 2305.36232989
284 283 2304.35055161
285 284 2298.43070463
286 285 2294.45402787
287 286 2292.7195986
288 287 2285.17458448
289 288 2284.62488929
290 289 2276.58225171
291 290 2275.53942696
```

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   292 291 2269.94595299
   293 292 2265.61854205
   294 293 2263.88360106
   295 294 2256.46130505
   296 295 2255.89252157
   297 296 2247.39872994
   298 297 2246.35740823
   299 298 2241.02643385
   300 299 2236.85874216
Final mean squared error (training) = 0.0965414147348 at iteration 300
Final CER (validation) = 0.0419834879974 at iteration 298
Trial>> analysis
(1) Use weights minimizing the validation error
(2) Use weights minimizing the training error
Which set of weights you would like to use? 1
Number of folds: k = 5
No. of training patterns = 10000
Fold = 1
No. of hidden layer neurons = 130
Number of weights in the neural network = 103360
No. of iterations = 299
CER per class (training)
  Columns 1 through 7
    0.0141    0.0426    0.0594    0.0479    0.0695    0.0313    0.0564
  Columns 8 through 10
    0.0370    0.0684    0.0153
Fold 1: RMSE = 0.105922942057 | Average CER for all classes = 0.0441893870164
Fold = 2
No. of iterations = 298
CER per class (training)
  Columns 1 through 7
    0.0194    0.0475    0.0535    0.0560    0.0818    0.0313    0.0603
  Columns 8 through 10
    0.0359    0.0644    0.0163
Fold 2: RMSE = 0.104796193715 | Average CER for all classes = 0.0466483502625
Fold = 3
No. of iterations = 296
CER per class (training)
  Columns 1 through 7
    0.0150    0.0368    0.0505    0.0448    0.0605    0.0449    0.0671
  Columns 8 through 10
    0.0411    0.0585    0.0163
Fold 3: RMSE = 0.104418876362 | Average CER for all classes = 0.0435513191216
Fold = 4
No. of iterations = 296
CER per class (training)
  Columns 1 through 7
    0.0141    0.0523    0.0465    0.0418    0.0628    0.0355    0.0681
  Columns 8 through 10
    0.0370    0.0634    0.0143
Fold 4: RMSE = 0.101144183146 | Average CER for all classes = 0.0435748776028
Fold = 5
No. of iterations = 298
CER per class (training)
  Columns 1 through 7
    0.0159    0.0523    0.0485    0.0418    0.0740    0.0355    0.0486
  Columns 8 through 10
    0.0329    0.0595    0.0163
Fold 5: RMSE = 0.0997717155455 | Average CER for all classes = 0.0425216317034
Average mean squared error for the k MLPs in train.mat = 0.103210782165
Trial>>
```