**Letter Recognition Dataset, classifier = multiclass(C=10.0, kernel=kernels.rbf(0.05), tol=2.0)**

**Only Incremental – Baseline**

**Classification report:**

precision recall f1-score support

0 1.00 0.99 0.99 209

1 0.81 0.97 0.88 218

2 1.00 0.89 0.94 230

3 0.94 0.96 0.95 248

4 0.86 0.98 0.92 234

5 0.90 0.97 0.93 225

6 0.89 0.95 0.92 219

7 0.80 0.93 0.86 217

8 0.97 0.95 0.96 215

9 0.97 0.93 0.95 220

10 0.96 0.88 0.92 245

11 1.00 0.93 0.96 237

12 1.00 0.94 0.97 234

13 0.98 0.94 0.96 251

14 0.85 0.99 0.92 221

15 1.00 0.89 0.94 265

16 0.98 0.91 0.94 235

17 0.89 0.93 0.91 243

18 0.99 0.94 0.96 228

19 0.97 0.98 0.98 239

20 0.98 0.97 0.98 224

21 0.95 0.95 0.95 211

22 0.99 0.94 0.97 222

23 0.96 0.98 0.97 244

24 0.99 0.92 0.96 237

25 0.99 0.94 0.97 229

micro avg 0.94 0.94 0.94 6000

macro avg 0.95 0.94 0.94 6000

weighted avg 0.95 0.94 0.94 6000

**Confusion matrix:**

[[206 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 1

0 0 0 0 0 0 0 0]

[ 0 212 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 2

0 0 0 0 0 2 0 0]

[ 0 1 205 0 6 1 6 1 0 0 0 0 0 0 9 0 1 0

0 0 0 0 0 0 0 0]

[ 0 1 0 237 0 0 0 2 0 0 0 0 0 1 4 0 0 2

1 0 0 0 0 0 0 0]

[ 0 0 0 0 229 1 4 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0]

[ 0 1 0 1 0 218 0 2 0 0 0 0 0 0 0 1 0 0

1 1 0 0 0 0 0 0]

[ 0 1 0 4 1 1 207 1 0 0 0 0 0 0 0 0 0 2

0 0 0 2 0 0 0 0]

[ 0 3 0 3 0 0 1 201 0 0 4 0 0 0 3 0 0 2

0 0 0 0 0 0 0 0]

[ 0 0 0 0 0 1 0 0 205 7 1 0 0 0 0 0 0 0

0 0 0 0 0 1 0 0]

[ 0 1 0 0 0 2 0 1 6 204 0 0 0 1 1 0 0 1

0 0 2 0 0 1 0 0]

[ 0 4 0 0 1 0 2 11 0 0 216 0 0 0 0 0 0 8

0 0 0 0 0 3 0 0]

[ 0 1 0 0 3 1 2 2 0 0 1 221 0 0 0 0 0 3

0 2 0 0 0 1 0 0]

[ 0 3 0 0 0 1 1 4 0 0 0 0 221 0 1 0 0 2

0 0 0 0 1 0 0 0]

[ 0 2 0 0 0 0 0 5 0 0 0 0 0 236 3 0 0 2

0 0 1 2 0 0 0 0]

[ 0 0 0 1 0 0 2 0 0 0 0 0 0 0 218 0 0 0

0 0 0 0 0 0 0 0]

[ 0 2 0 1 1 12 0 5 0 0 0 0 0 0 4 236 1 1

0 0 1 0 0 0 1 0]

[ 0 0 0 0 9 0 3 0 0 0 0 0 0 0 8 0 214 0

0 0 0 0 1 0 0 0]

[ 0 11 0 0 0 0 1 2 0 0 2 0 0 1 0 0 0 226

0 0 0 0 0 0 0 0]

[ 0 2 0 0 7 1 0 1 0 0 0 0 0 0 0 0 0 1

214 0 0 0 0 0 0 2]

[ 0 0 0 1 0 0 0 1 0 0 0 0 0 0 1 0 0 0

0 234 0 0 0 1 1 0]

[ 0 0 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0 0

0 0 218 0 0 0 0 0]

[ 0 8 0 0 0 2 0 1 0 0 0 0 0 0 0 0 0 0

0 0 0 200 0 0 0 0]

[ 0 1 0 0 0 0 3 2 0 0 0 0 0 1 3 0 0 0

0 0 1 2 209 0 0 0]

[ 0 1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1

0 0 0 0 0 240 0 0]

[ 0 4 0 0 0 1 1 2 0 0 0 0 0 0 0 0 1 0

0 3 0 5 0 1 219 0]

[ 0 3 0 2 6 0 0 0 0 0 0 0 0 0 0 0 2 0

0 0 0 0 0 0 0 216]]

**Accuracy:** 94.36666666666666

**Non-Accelerated Run time:** 1:05:11.4785

**Accelerated Run time:** 0:05:35.380086

**Misclassified Samples only**

**Classification report:**

precision recall f1-score support

0 1.00 0.97 0.98 209

1 0.80 0.93 0.86 218

2 0.99 0.96 0.97 230

3 0.83 0.95 0.88 248

4 0.89 0.92 0.90 234

5 0.91 0.95 0.93 225

6 0.88 0.95 0.92 219

7 0.88 0.81 0.84 217

8 0.95 0.90 0.92 215

9 0.97 0.92 0.94 220

10 0.92 0.89 0.90 245

11 0.94 0.97 0.95 237

12 0.99 0.94 0.97 234

13 0.93 0.93 0.93 251

14 0.91 0.95 0.93 221

15 0.98 0.91 0.94 265

16 0.96 0.92 0.94 235

17 0.89 0.91 0.90 243

18 0.96 0.93 0.94 228

19 0.98 0.96 0.97 239

20 0.96 0.96 0.96 224

21 0.89 0.97 0.93 211

22 0.99 0.94 0.97 222

23 0.98 0.90 0.94 244

24 0.97 0.95 0.96 237

25 0.97 0.95 0.96 229

micro avg 0.93 0.93 0.93 6000

macro avg 0.93 0.93 0.93 6000

weighted avg 0.93 0.93 0.93 6000

**Confusion matrix**:

[[202 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 2 3

0 0 0 0 0 0 0 0]

[ 0 203 0 1 6 0 0 1 0 0 1 0 0 0 0 0 0 1

0 0 0 5 0 0 0 0]

[ 0 0 221 0 2 0 3 1 0 0 0 0 0 0 3 0 0 0

0 0 0 0 0 0 0 0]

[ 0 2 0 236 0 0 0 0 0 0 1 0 0 1 5 0 0 2

0 1 0 0 0 0 0 0]

[ 0 1 0 0 215 2 8 0 0 0 0 3 0 0 0 0 0 0

3 0 0 0 0 0 0 2]

[ 0 1 0 2 0 213 1 0 1 0 0 0 0 1 0 2 0 0

2 1 0 0 0 0 1 0]

[ 0 1 0 4 0 1 209 0 0 0 0 1 0 0 1 0 0 0

0 0 0 2 0 0 0 0]

[ 0 10 1 12 1 0 2 176 0 0 5 0 1 2 2 0 0 2

0 0 1 2 0 0 0 0]

[ 0 0 1 8 1 1 1 0 194 4 1 1 0 0 0 0 0 0

1 0 0 0 0 2 0 0]

[ 0 1 0 0 0 0 0 0 8 202 0 1 0 1 1 0 0 1

1 1 1 1 0 1 0 0]

[ 0 2 0 0 2 0 1 9 0 0 217 0 0 0 0 0 0 11

0 0 0 2 0 1 0 0]

[ 0 0 0 3 2 0 0 0 0 0 1 229 0 0 0 0 1 0

0 0 0 0 0 0 0 1]

[ 0 1 0 2 0 0 1 2 0 0 0 0 221 3 0 0 0 1

0 0 1 1 1 0 0 0]

[ 0 2 0 3 0 1 0 4 1 0 2 0 0 233 1 0 0 3

0 0 0 1 0 0 0 0]

[ 0 1 0 1 0 0 3 0 0 0 0 0 0 2 211 0 1 1

0 0 0 0 1 0 0 0]

[ 0 2 0 1 0 14 0 0 0 0 0 0 0 0 1 242 1 1

0 0 0 2 0 0 1 0]

[ 0 0 0 0 8 0 2 1 1 0 0 0 0 0 5 1 216 0

0 0 0 0 0 0 0 1]

[ 0 6 0 4 0 0 0 4 0 0 4 0 0 2 0 0 0 221

0 0 0 2 0 0 0 0]

[ 0 7 0 0 0 0 2 0 0 0 0 0 0 0 0 0 0 0

213 0 0 3 0 0 0 3]

[ 0 0 0 2 0 1 0 0 0 0 0 1 0 0 0 1 0 0

0 229 0 0 0 0 5 0]

[ 0 0 1 2 0 0 0 2 0 0 0 0 0 4 0 0 0 0

0 0 214 1 0 0 0 0]

[ 0 5 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0

0 0 0 204 0 0 0 0]

[ 0 1 0 0 0 1 1 1 0 0 1 0 1 2 1 1 0 0

0 0 1 2 209 0 0 0]

[ 0 4 0 3 3 0 2 0 0 0 3 6 0 0 1 0 0 2

0 0 0 0 0 220 0 0]

[ 1 3 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0

0 2 4 0 0 0 225 0]

[ 0 2 0 1 2 0 0 0 0 2 0 0 0 0 0 0 2 0

3 0 0 0 0 0 0 217]]

**Accuracy:** 93.2

**Non-Accelerated Run time:** 0:59:21.231121

**Accelerated Run time:** 0:06:26.113106

**Misclassified Samples + Marginal**

**Classification report:**

precision recall f1-score support

0 0.99 0.98 0.99 209

1 0.82 0.99 0.90 218

2 1.00 0.90 0.94 230

3 0.91 0.97 0.94 248

4 0.86 0.97 0.91 234

5 0.90 0.95 0.92 225

6 0.86 0.95 0.90 219

7 0.83 0.92 0.87 217

8 0.97 0.91 0.94 215

9 0.96 0.91 0.94 220

10 0.97 0.89 0.93 245

11 0.99 0.93 0.96 237

12 1.00 0.94 0.96 234

13 0.98 0.94 0.96 251

14 0.89 0.98 0.93 221

15 0.98 0.91 0.95 265

16 0.97 0.94 0.95 235

17 0.92 0.92 0.92 243

18 0.98 0.93 0.96 228

19 0.97 0.98 0.97 239

20 0.99 0.97 0.98 224

21 0.95 0.95 0.95 211

22 1.00 0.95 0.97 222

23 0.95 0.98 0.97 244

24 1.00 0.93 0.96 237

25 1.00 0.95 0.97 229

micro avg 0.94 0.94 0.94 6000

macro avg 0.95 0.94 0.94 6000

weighted avg 0.95 0.94 0.94 6000

**Confusion matrix:**

[[205 1 0 1 0 0 1 0 0 0 0 1 0 0 0 0 0 0

0 0 0 0 0 0 0 0]

[ 0 216 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 1 0 0 0 0]

[ 0 0 206 0 8 0 7 1 0 0 1 0 0 0 4 0 1 0

0 0 0 0 0 2 0 0]

[ 0 1 0 240 0 0 0 4 0 0 0 0 0 0 2 0 0 1

0 0 0 0 0 0 0 0]

[ 0 0 0 0 226 1 7 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0]

[ 0 1 0 3 0 214 0 1 0 0 0 0 0 0 0 2 0 0

2 2 0 0 0 0 0 0]

[ 0 1 0 4 1 1 207 1 0 0 0 0 1 0 2 0 0 0

0 0 0 1 0 0 0 0]

[ 0 6 0 2 0 0 3 200 0 0 3 0 0 0 2 0 0 1

0 0 0 0 0 0 0 0]

[ 0 1 1 0 2 3 0 0 196 8 0 1 0 0 0 0 0 0

1 0 0 0 0 2 0 0]

[ 0 2 0 2 0 0 0 2 6 201 0 1 0 1 1 0 0 1

1 0 1 0 0 1 0 0]

[ 0 3 0 0 2 0 1 12 0 0 217 0 0 0 0 0 0 7

0 0 0 0 0 3 0 0]

[ 0 0 0 0 2 1 2 1 0 0 1 221 0 0 0 0 1 3

0 2 0 0 0 3 0 0]

[ 0 3 0 0 0 1 3 4 0 0 0 0 219 1 1 0 0 1

0 0 0 0 1 0 0 0]

[ 0 3 0 2 0 0 0 3 0 0 0 0 0 236 4 0 0 2

0 0 0 1 0 0 0 0]

[ 0 1 0 1 0 0 1 0 0 0 0 0 0 0 217 0 1 0

0 0 0 0 0 0 0 0]

[ 0 1 0 1 2 12 0 1 0 0 0 0 0 0 3 242 1 1

0 0 0 0 0 0 1 0]

[ 0 0 0 0 4 0 3 0 0 0 0 0 0 0 5 1 222 0

0 0 0 0 0 0 0 0]

[ 0 9 0 3 0 0 1 4 0 0 1 0 0 1 0 0 0 224

0 0 0 0 0 0 0 0]

[ 0 4 0 0 6 3 0 0 0 0 0 0 0 0 0 0 0 1

213 0 0 0 0 0 0 1]

[ 0 0 0 1 0 2 0 1 0 0 0 0 0 0 0 0 0 0

0 234 0 0 0 1 0 0]

[ 0 0 0 0 0 0 1 4 0 0 0 0 0 1 0 0 0 0

0 0 218 0 0 0 0 0]

[ 0 6 0 1 1 0 0 1 0 0 0 0 0 0 0 1 0 0

0 0 0 201 0 0 0 0]

[ 0 1 0 0 0 0 3 0 0 0 0 0 0 0 3 0 0 0

0 0 2 3 210 0 0 0]

[ 0 1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1

0 0 0 0 0 240 0 0]

[ 2 3 0 0 0 1 0 2 0 0 0 0 0 0 0 0 1 0

0 4 0 4 0 0 220 0]

[ 0 0 0 1 7 0 0 0 0 0 0 0 0 0 0 0 3 0

0 0 0 0 0 0 0 218]]

**Accuracy:** 94.38333333333333

**Non-Accelerated Run time:** 3:12:47.5610

**Accelerated Run time:** 0:10:02.701196