File - EMNIST_train

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C:\ProgramData\Anaconda3\envs\MLenv\python.exe "C:\Users\aberf\Documents\GitHub\CS-534\Final Project\
EMNIST_train.py"

Loading Datasets...
Total No of Images in EMNIST-Letters dataset: 145600
No of images in Training dataset:     124800
No of images in Testing dataset:      20800


Neural Network Structure:
EMNIST_Net(
  (conv1): Sequential(
    (0): Conv2d(1, 64, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1))
    (1): BatchNorm2d(64, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (2): ReLU(inplace=True)
  )
  (conv2): Sequential(
    (0): Conv2d(64, 128, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1))
    (1): BatchNorm2d(128, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (2): ReLU(inplace=True)
  )
  (conv3): Sequential(
    (0): Conv2d(128, 256, kernel_size=(3, 3), stride=(1, 1), padding=(1, 1))
    (1): BatchNorm2d(256, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)
    (2): ReLU(inplace=True)
  )
  (pool_layer): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (classifier): Sequential(
    (0): MaxPool2d(kernel_size=7, stride=7, padding=0, dilation=1, ceil_mode=False)
    (1): Flatten(start_dim=1, end_dim=-1)
    (2): Dropout(p=0.2, inplace=False)
    (3): Linear(in_features=1024, out_features=26, bias=True)
  )
)

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35
36 Training Parameters:
37 Epoch Count: 25,    Batch Size: 200
38 Learning Rate: 5e-05,   Weight Decay: 0.0001
39
40 Training Epoch...
41 100%|██████████| 624/624 [00:52<00:00, 11.97it/s]
42
43 Testing Model...
44 100%|██████████| 104/104 [00:05<00:00, 19.83it/s]
45 Epoch: 1,   Val-Loss: 0.7253,   Val-Accuracy: 77.7%,    Train-Accuracy: 78.0%
46
47 Training Epoch...
48 100%|██████████| 624/624 [00:47<00:00, 13.17it/s]
49
50 Testing Model...
51 100%|██████████| 104/104 [00:05<00:00, 19.65it/s]
52 Epoch: 2,   Val-Loss: 0.5202,   Val-Accuracy: 83.89999999999999%,   Train-Accuracy: 84.5%
53
54 Training Epoch...
55 100%|██████████| 624/624 [00:47<00:00, 13.12it/s]
56
57 Testing Model...
58 100%|██████████| 104/104 [00:05<00:00, 19.67it/s]
59 Epoch: 3,   Val-Loss: 0.4364,   Val-Accuracy: 86.0%,    Train-Accuracy: 84.5%
60
61 Training Epoch...
62 100%|██████████| 624/624 [00:47<00:00, 13.15it/s]
63
64 Testing Model...
65 100%|██████████| 104/104 [00:05<00:00, 19.90it/s]
66 Epoch: 4,   Val-Loss: 0.3926,   Val-Accuracy: 87.5%,    Train-Accuracy: 86.5%
67
68 Training Epoch...
69 100%|██████████| 624/624 [00:48<00:00, 12.75it/s]
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 70
 71 Testing Model...
 72 100%|██████████| 104/104 [00:05<00:00, 19.41it/s]
 73 Epoch: 5,   Val-Loss: 0.3576,   Val-Accuracy: 88.7%,    Train-Accuracy: 88.5%
 74
 75 Training Epoch...
 76 100%|██████████| 624/624 [00:48<00:00, 12.81it/s]
 77
 78 Testing Model...
 79 100%|██████████| 104/104 [00:06<00:00, 14.89it/s]
 80 Epoch: 6,   Val-Loss: 0.3465,   Val-Accuracy: 89.0%,    Train-Accuracy: 92.0%
 81
 82 Training Epoch...
 83 100%|██████████| 624/624 [00:48<00:00, 12.91it/s]
 84
 85 Testing Model...
 86 100%|██████████| 104/104 [00:05<00:00, 19.42it/s]
 87 Epoch: 7,   Val-Loss: 0.3306,   Val-Accuracy: 89.60000000000001%,   Train-Accuracy: 84.0%
 88
 89 Training Epoch...
 90 100%|██████████| 624/624 [00:47<00:00, 13.11it/s]
 91
 92 Testing Model...
 93 100%|██████████| 104/104 [00:05<00:00, 19.64it/s]
 94 Epoch: 8,   Val-Loss: 0.3055,   Val-Accuracy: 90.2%,    Train-Accuracy: 92.5%
 95
 96 Training Epoch...
 97 100%|██████████| 624/624 [00:48<00:00, 12.97it/s]
 98
 99 Testing Model...
100 100%|██████████| 104/104 [00:05<00:00, 19.36it/s]
101 Epoch: 9,   Val-Loss: 0.2955,   Val-Accuracy: 90.60000000000001%,   Train-Accuracy: 90.5%
102
103 Training Epoch...
104 100%|██████████| 624/624 [00:47<00:00, 13.10it/s]
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105
106 Testing Model...
107 100%|██████████| 104/104 [00:05<00:00, 17.93it/s]
108 Epoch: 10,  Val-Loss: 0.2906,   Val-Accuracy: 90.7%,    Train-Accuracy: 93.0%
109
110 Training Epoch...
111 100%|██████████| 624/624 [00:48<00:00, 12.79it/s]
112
113 Testing Model...
114 100%|██████████| 104/104 [00:05<00:00, 18.60it/s]
115 Epoch: 11,  Val-Loss: 0.2775,   Val-Accuracy: 90.9%,    Train-Accuracy: 89.5%
116
117 Training Epoch...
118 100%|██████████| 624/624 [00:47<00:00, 13.16it/s]
119
120 Testing Model...
121 100%|██████████| 104/104 [00:05<00:00, 19.90it/s]
122 Epoch: 12,  Val-Loss: 0.2769,   Val-Accuracy: 91.2%,    Train-Accuracy: 92.5%
123
124 Training Epoch...
125 100%|██████████| 624/624 [00:47<00:00, 13.08it/s]
126
127 Testing Model...
128 100%|██████████| 104/104 [00:05<00:00, 18.67it/s]
129 Epoch: 13,  Val-Loss: 0.2673,   Val-Accuracy: 91.4%,    Train-Accuracy: 92.0%
130
131 Training Epoch...
132 100%|██████████| 624/624 [00:47<00:00, 13.17it/s]
133
134 Testing Model...
135 100%|██████████| 104/104 [00:05<00:00, 19.76it/s]
136 Epoch: 14,  Val-Loss: 0.2645,   Val-Accuracy: 91.4%,    Train-Accuracy: 95.0%
137
138 Training Epoch...
139 100%|██████████| 624/624 [00:48<00:00, 12.85it/s]
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140
141 Testing Model...
142 100%|██████████| 104/104 [00:05<00:00, 19.52it/s]
143 Epoch: 15,  Val-Loss: 0.2631,   Val-Accuracy: 91.5%,    Train-Accuracy: 94.0%
144
145 Training Epoch...
146 100%|██████████| 624/624 [00:49<00:00, 12.67it/s]
147
148 Testing Model...
149 100%|██████████| 104/104 [00:06<00:00, 16.02it/s]
150 Epoch: 16,  Val-Loss: 0.2531,   Val-Accuracy: 91.7%,    Train-Accuracy: 92.0%
151
152 Training Epoch...
153 100%|██████████| 624/624 [00:48<00:00, 12.85it/s]
154
155 Testing Model...
156 100%|██████████| 104/104 [00:05<00:00, 18.76it/s]
157 Epoch: 17,  Val-Loss: 0.2486,   Val-Accuracy: 92.10000000000001%,   Train-Accuracy: 90.0%
158
159 Training Epoch...
160 100%|██████████| 624/624 [00:48<00:00, 12.91it/s]
161
162 Testing Model...
163 100%|██████████| 104/104 [00:05<00:00, 17.53it/s]
164 Epoch: 18,  Val-Loss: 0.2523,   Val-Accuracy: 92.10000000000001%,   Train-Accuracy: 93.0%
165
166 Training Epoch...
167 100%|██████████| 624/624 [00:47<00:00, 13.06it/s]
168
169 Testing Model...
170 100%|██████████| 104/104 [00:05<00:00, 19.27it/s]
171 Epoch: 19,  Val-Loss: 0.2473,   Val-Accuracy: 91.9%,    Train-Accuracy: 92.0%
172
173 Training Epoch...
174 100%|██████████| 624/624 [00:48<00:00, 12.96it/s]
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175
176 Testing Model...
177 100%|██████████| 104/104 [00:05<00:00, 19.61it/s]
178 Epoch: 20,  Val-Loss: 0.2416,   Val-Accuracy: 92.2%,    Train-Accuracy: 92.0%
179
180 Training Epoch...
181 100%|██████████| 624/624 [00:47<00:00, 13.14it/s]
182
183 Testing Model...
184 100%|██████████| 104/104 [00:05<00:00, 19.72it/s]
185 Epoch: 21,  Val-Loss: 0.2476,   Val-Accuracy: 92.0%,    Train-Accuracy: 92.5%
186
187 Training Epoch...
188 100%|██████████| 624/624 [00:46<00:00, 13.31it/s]
189
190 Testing Model...
191 100%|██████████| 104/104 [00:05<00:00, 18.72it/s]
192 Epoch: 22,  Val-Loss: 0.2408,   Val-Accuracy: 92.30000000000001%,   Train-Accuracy: 91.0%
193
194 Training Epoch...
195 100%|██████████| 624/624 [00:48<00:00, 12.86it/s]
196
197 Testing Model...
198 100%|██████████| 104/104 [00:05<00:00, 19.32it/s]
199 Epoch: 23,  Val-Loss: 0.2361,   Val-Accuracy: 92.5%,    Train-Accuracy: 92.5%
200
201 Training Epoch...
202 100%|██████████| 624/624 [00:48<00:00, 12.94it/s]
203
204 Testing Model...
205 100%|██████████| 104/104 [00:05<00:00, 18.80it/s]
206 Epoch: 24,  Val-Loss: 0.2368,   Val-Accuracy: 92.4%,    Train-Accuracy: 95.0%
207
208 Training Epoch...
209 100%|██████████| 624/624 [00:48<00:00, 12.86it/s]
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210
211 Testing Model...
212 100%|██████████| 104/104 [00:05<00:00, 19.33it/s]
213 Epoch: 25,  Val-Loss: 0.2364,   Val-Accuracy: 92.4%,    Train-Accuracy: 92.0%
214
215
216 Process finished with exit code 0
217
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