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1 /usr/local/bin/python3.8 "/Users/surajvaddi/Desktop/TarPrint Full Journey/Machine Learning Code/Neural-Network-NO-test.py"
2 2020-09-03 19:24:49.648826: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions in performance-critical operations: AVX2 FMA
3 To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
4 ['norm_impervious' 'tan_impervious' 'norm_impervious' ...]
5 'norm_impervious' 'dry_pervious' 'norm_pervious']
6 [2 5 2 ... 2 0 3]
7 2020-09-03 19:24:49.658527: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x7ffc3a60a630 initialized for platform Host (this does not guarantee that XLA will be used). Devices:
8 2020-09-03 19:24:49.658553: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
9 [[0.30362644 0.32236881 0.29612949 ... 0.37484746 0
.38234441 0.32236881]
10 [0.38498641 0.33609925 0.26582395 ... 0.35748738 0
.32998835 0.25665761]
11 [0.32926562 0.33627127 0.29774019 ... 0.37830518 0
.381808 0.31875714]
12 ...
13 [0.31306804 0.32338897 0.28554558 ... 0.40251605 0
.40595636 0.35435174]
14 [0.42824723 0.39255996 0.27955027 ... 0.26765452 0
.28549815 0.19925392]
15 [0.21592634 0.31118796 0.19052324 ... 0.38739725 0
.450905 0.28578486]]
16 (2138, 9)
17 (2138, 7)
18 Epoch 1/350
19 143/143 [=====] - 0s 644us
/step - loss: 1.5493 - accuracy: 0.4093
20 Epoch 2/350
21 143/143 [=====] - 0s 573us
/step - loss: 0.9230 - accuracy: 0.6885
22 Epoch 3/350
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23 143/143 [=====] - 0s 599us
  /step - loss: 0.7021 - accuracy: 0.7507
24 Epoch 4/350
25 143/143 [=====] - 0s 599us
  /step - loss: 0.6284 - accuracy: 0.7848
26 Epoch 5/350
27 143/143 [=====] - 0s 571us
  /step - loss: 0.6011 - accuracy: 0.7825
28 Epoch 6/350
29 143/143 [=====] - 0s 642us
  /step - loss: 0.5691 - accuracy: 0.7891
30 Epoch 7/350
31 143/143 [=====] - 0s 575us
  /step - loss: 0.5822 - accuracy: 0.7947
32 Epoch 8/350
33 143/143 [=====] - 0s 650us
  /step - loss: 0.5511 - accuracy: 0.8017
34 Epoch 9/350
35 143/143 [=====] - 0s 604us
  /step - loss: 0.5245 - accuracy: 0.8124
36 Epoch 10/350
37 143/143 [=====] - 0s 846us
  /step - loss: 0.5224 - accuracy: 0.8134
38 Epoch 11/350
39 143/143 [=====] - 0s 666us
  /step - loss: 0.5275 - accuracy: 0.8064
40 Epoch 12/350
41 143/143 [=====] - 0s 579us
  /step - loss: 0.5066 - accuracy: 0.8152
42 Epoch 13/350
43 143/143 [=====] - 0s 689us
  /step - loss: 0.5040 - accuracy: 0.8209
44 Epoch 14/350
45 143/143 [=====] - 0s 569us
  /step - loss: 0.4838 - accuracy: 0.8265
46 Epoch 15/350
47 143/143 [=====] - 0s 572us
  /step - loss: 0.4848 - accuracy: 0.8260
48 Epoch 16/350
49 143/143 [=====] - 0s 620us
  /step - loss: 0.4940 - accuracy: 0.8241
50 Epoch 17/350
51 143/143 [=====] - 0s 589us
  /step - loss: 0.4811 - accuracy: 0.8199
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52 Epoch 18/350
53 143/143 [=====] - 0s 646us
    /step - loss: 0.4867 - accuracy: 0.8265
54 Epoch 19/350
55 143/143 [=====] - 0s 600us
    /step - loss: 0.4787 - accuracy: 0.8340
56 Epoch 20/350
57 143/143 [=====] - 0s 588us
    /step - loss: 0.4701 - accuracy: 0.8335
58 Epoch 21/350
59 143/143 [=====] - 0s 623us
    /step - loss: 0.4711 - accuracy: 0.8288
60 Epoch 22/350
61 143/143 [=====] - 0s 594us
    /step - loss: 0.4645 - accuracy: 0.8377
62 Epoch 23/350
63 143/143 [=====] - 0s 743us
    /step - loss: 0.4648 - accuracy: 0.8349
64 Epoch 24/350
65 143/143 [=====] - 0s 616us
    /step - loss: 0.4650 - accuracy: 0.8340
66 Epoch 25/350
67 143/143 [=====] - 0s 624us
    /step - loss: 0.4577 - accuracy: 0.8363
68 Epoch 26/350
69 143/143 [=====] - 0s 632us
    /step - loss: 0.4631 - accuracy: 0.8321
70 Epoch 27/350
71 143/143 [=====] - 0s 592us
    /step - loss: 0.4462 - accuracy: 0.8414
72 Epoch 28/350
73 143/143 [=====] - 0s 681us
    /step - loss: 0.4319 - accuracy: 0.8424
74 Epoch 29/350
75 143/143 [=====] - 0s 601us
    /step - loss: 0.4397 - accuracy: 0.8386
76 Epoch 30/350
77 143/143 [=====] - 0s 591us
    /step - loss: 0.4338 - accuracy: 0.8433
78 Epoch 31/350
79 143/143 [=====] - 0s 603us
    /step - loss: 0.4360 - accuracy: 0.8461
80 Epoch 32/350
81 143/143 [=====] - 0s 566us
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81 /step - loss: 0.4243 - accuracy: 0.8400
82 Epoch 33/350
83 143/143 [=====] - 0s
639us/step - loss: 0.4453 - accuracy: 0.8419
84 Epoch 34/350
85 143/143 [=====] - 0s
625us/step - loss: 0.4296 - accuracy: 0.8414
86 Epoch 35/350
87 143/143 [=====] - 0s
561us/step - loss: 0.4277 - accuracy: 0.8424
88 Epoch 36/350
89 143/143 [=====] - 0s
618us/step - loss: 0.4528 - accuracy: 0.8368
90 Epoch 37/350
91 143/143 [=====] - 0s
590us/step - loss: 0.4318 - accuracy: 0.8438
92 Epoch 38/350
93 143/143 [=====] - 0s
657us/step - loss: 0.4152 - accuracy: 0.8499
94 Epoch 39/350
95 143/143 [=====] - 0s
601us/step - loss: 0.4265 - accuracy: 0.8503
96 Epoch 40/350
97 143/143 [=====] - 0s
606us/step - loss: 0.4377 - accuracy: 0.8442
98 Epoch 41/350
99 143/143 [=====] - 0s
605us/step - loss: 0.4209 - accuracy: 0.8452
100 Epoch 42/350
101 143/143 [=====] - 0s
568us/step - loss: 0.4095 - accuracy: 0.8531
102 Epoch 43/350
103 143/143 [=====] - 0s
636us/step - loss: 0.4192 - accuracy: 0.8457
104 Epoch 44/350
105 143/143 [=====] - 0s
619us/step - loss: 0.4099 - accuracy: 0.8485
106 Epoch 45/350
107 143/143 [=====] - 0s
615us/step - loss: 0.4054 - accuracy: 0.8508
108 Epoch 46/350
109 143/143 [=====] - 0s
589us/step - loss: 0.3998 - accuracy: 0.8475
110 Epoch 47/350
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111 143/143 [=====] - 0s
    562us/step - loss: 0.4042 - accuracy: 0.8457
112 Epoch 48/350
113 143/143 [=====] - 0s
    689us/step - loss: 0.4066 - accuracy: 0.8485
114 Epoch 49/350
115 143/143 [=====] - 0s
    604us/step - loss: 0.4085 - accuracy: 0.8508
116 Epoch 50/350
117 143/143 [=====] - 0s
    599us/step - loss: 0.4121 - accuracy: 0.8447
118 Epoch 51/350
119 143/143 [=====] - 0s
    624us/step - loss: 0.4083 - accuracy: 0.8475
120 Epoch 52/350
121 143/143 [=====] - 0s
    570us/step - loss: 0.3856 - accuracy: 0.8545
122 Epoch 53/350
123 143/143 [=====] - 0s
    655us/step - loss: 0.4070 - accuracy: 0.8480
124 Epoch 54/350
125 143/143 [=====] - 0s
    597us/step - loss: 0.4026 - accuracy: 0.8517
126 Epoch 55/350
127 143/143 [=====] - 0s
    596us/step - loss: 0.3833 - accuracy: 0.8569
128 Epoch 56/350
129 143/143 [=====] - 0s
    630us/step - loss: 0.3832 - accuracy: 0.8597
130 Epoch 57/350
131 143/143 [=====] - 0s
    571us/step - loss: 0.3810 - accuracy: 0.8606
132 Epoch 58/350
133 143/143 [=====] - 0s
    685us/step - loss: 0.3952 - accuracy: 0.8583
134 Epoch 59/350
135 143/143 [=====] - 0s
    597us/step - loss: 0.3823 - accuracy: 0.8601
136 Epoch 60/350
137 143/143 [=====] - 0s
    592us/step - loss: 0.3811 - accuracy: 0.8601
138 Epoch 61/350
139 143/143 [=====] - 0s
    606us/step - loss: 0.3764 - accuracy: 0.8606
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140 Epoch 62/350
141 143/143 [=====] - 0s
    592us/step - loss: 0.3645 - accuracy: 0.8597
142 Epoch 63/350
143 143/143 [=====] - 0s
    652us/step - loss: 0.3745 - accuracy: 0.8592
144 Epoch 64/350
145 143/143 [=====] - 0s
    595us/step - loss: 0.3965 - accuracy: 0.8499
146 Epoch 65/350
147 143/143 [=====] - 0s
    577us/step - loss: 0.3738 - accuracy: 0.8606
148 Epoch 66/350
149 143/143 [=====] - 0s
    615us/step - loss: 0.3694 - accuracy: 0.8658
150 Epoch 67/350
151 143/143 [=====] - 0s
    569us/step - loss: 0.3602 - accuracy: 0.8690
152 Epoch 68/350
153 143/143 [=====] - 0s
    665us/step - loss: 0.3557 - accuracy: 0.8648
154 Epoch 69/350
155 143/143 [=====] - 0s
    581us/step - loss: 0.3676 - accuracy: 0.8592
156 Epoch 70/350
157 143/143 [=====] - 0s
    562us/step - loss: 0.3617 - accuracy: 0.8630
158 Epoch 71/350
159 143/143 [=====] - 0s
    595us/step - loss: 0.3725 - accuracy: 0.8587
160 Epoch 72/350
161 143/143 [=====] - 0s
    553us/step - loss: 0.3577 - accuracy: 0.8667
162 Epoch 73/350
163 143/143 [=====] - 0s
    651us/step - loss: 0.3589 - accuracy: 0.8676
164 Epoch 74/350
165 143/143 [=====] - 0s
    669us/step - loss: 0.3636 - accuracy: 0.8644
166 Epoch 75/350
167 143/143 [=====] - 0s
    615us/step - loss: 0.3640 - accuracy: 0.8648
168 Epoch 76/350
169 143/143 [=====] - 0s
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169 674us/step - loss: 0.3598 - accuracy: 0.8672
170 Epoch 77/350
171 143/143 [=====] - 0s
    567us/step - loss: 0.3555 - accuracy: 0.8704
172 Epoch 78/350
173 143/143 [=====] - 0s
    679us/step - loss: 0.3467 - accuracy: 0.8732
174 Epoch 79/350
175 143/143 [=====] - 0s
    688us/step - loss: 0.3439 - accuracy: 0.8742
176 Epoch 80/350
177 143/143 [=====] - 0s
    621us/step - loss: 0.3546 - accuracy: 0.8714
178 Epoch 81/350
179 143/143 [=====] - 0s
    612us/step - loss: 0.3576 - accuracy: 0.8639
180 Epoch 82/350
181 143/143 [=====] - 0s
    568us/step - loss: 0.3418 - accuracy: 0.8704
182 Epoch 83/350
183 143/143 [=====] - 0s
    638us/step - loss: 0.3446 - accuracy: 0.8728
184 Epoch 84/350
185 143/143 [=====] - 0s
    602us/step - loss: 0.3488 - accuracy: 0.8784
186 Epoch 85/350
187 143/143 [=====] - 0s
    605us/step - loss: 0.3465 - accuracy: 0.8704
188 Epoch 86/350
189 143/143 [=====] - 0s
    604us/step - loss: 0.3383 - accuracy: 0.8672
190 Epoch 87/350
191 143/143 [=====] - 0s
    569us/step - loss: 0.3401 - accuracy: 0.8700
192 Epoch 88/350
193 143/143 [=====] - 0s
    639us/step - loss: 0.3361 - accuracy: 0.8751
194 Epoch 89/350
195 143/143 [=====] - 0s
    607us/step - loss: 0.3435 - accuracy: 0.8742
196 Epoch 90/350
197 143/143 [=====] - 0s
    605us/step - loss: 0.3387 - accuracy: 0.8704
198 Epoch 91/350
```

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199 143/143 [=====] - 0s
    614us/step - loss: 0.3227 - accuracy: 0.8709
200 Epoch 92/350
201 143/143 [=====] - 0s
    569us/step - loss: 0.3307 - accuracy: 0.8765
202 Epoch 93/350
203 143/143 [=====] - 0s
    658us/step - loss: 0.3606 - accuracy: 0.8634
204 Epoch 94/350
205 143/143 [=====] - 0s
    587us/step - loss: 0.3646 - accuracy: 0.8634
206 Epoch 95/350
207 143/143 [=====] - 0s
    570us/step - loss: 0.3269 - accuracy: 0.8714
208 Epoch 96/350
209 143/143 [=====] - 0s
    654us/step - loss: 0.3256 - accuracy: 0.8751
210 Epoch 97/350
211 143/143 [=====] - 0s
    568us/step - loss: 0.3429 - accuracy: 0.8709
212 Epoch 98/350
213 143/143 [=====] - 0s
    647us/step - loss: 0.3281 - accuracy: 0.8714
214 Epoch 99/350
215 143/143 [=====] - 0s
    591us/step - loss: 0.3393 - accuracy: 0.8695
216 Epoch 100/350
217 143/143 [=====] - 0s
    635us/step - loss: 0.3388 - accuracy: 0.8742
218 Epoch 101/350
219 143/143 [=====] - 0s
    607us/step - loss: 0.3418 - accuracy: 0.8690
220 Epoch 102/350
221 143/143 [=====] - 0s
    590us/step - loss: 0.3057 - accuracy: 0.8835
222 Epoch 103/350
223 143/143 [=====] - 0s
    654us/step - loss: 0.3247 - accuracy: 0.8756
224 Epoch 104/350
225 143/143 [=====] - 0s
    585us/step - loss: 0.3319 - accuracy: 0.8765
226 Epoch 105/350
227 143/143 [=====] - 0s
    555us/step - loss: 0.3248 - accuracy: 0.8779
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228 Epoch 106/350
229 143/143 [=====] - 0s
    615us/step - loss: 0.3247 - accuracy: 0.8779
230 Epoch 107/350
231 143/143 [=====] - 0s
    643us/step - loss: 0.3155 - accuracy: 0.8873
232 Epoch 108/350
233 143/143 [=====] - 0s
    673us/step - loss: 0.3241 - accuracy: 0.8789
234 Epoch 109/350
235 143/143 [=====] - 0s
    595us/step - loss: 0.3214 - accuracy: 0.8779
236 Epoch 110/350
237 143/143 [=====] - 0s
    596us/step - loss: 0.3162 - accuracy: 0.8789
238 Epoch 111/350
239 143/143 [=====] - 0s
    590us/step - loss: 0.3067 - accuracy: 0.8831
240 Epoch 112/350
241 143/143 [=====] - 0s
    581us/step - loss: 0.3106 - accuracy: 0.8877
242 Epoch 113/350
243 143/143 [=====] - 0s
    728us/step - loss: 0.3253 - accuracy: 0.8845
244 Epoch 114/350
245 143/143 [=====] - 0s
    597us/step - loss: 0.3270 - accuracy: 0.8704
246 Epoch 115/350
247 143/143 [=====] - 0s
    587us/step - loss: 0.3232 - accuracy: 0.8798
248 Epoch 116/350
249 143/143 [=====] - 0s
    607us/step - loss: 0.3159 - accuracy: 0.8821
250 Epoch 117/350
251 143/143 [=====] - 0s
    622us/step - loss: 0.3162 - accuracy: 0.8765
252 Epoch 118/350
253 143/143 [=====] - 0s
    647us/step - loss: 0.2970 - accuracy: 0.8831
254 Epoch 119/350
255 143/143 [=====] - 0s
    596us/step - loss: 0.3317 - accuracy: 0.8793
256 Epoch 120/350
257 143/143 [=====] - 0s
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257 567us/step - loss: 0.3186 - accuracy: 0.8789
258 Epoch 121/350
259 143/143 [=====] - 0s
    643us/step - loss: 0.3144 - accuracy: 0.8761
260 Epoch 122/350
261 143/143 [=====] - 0s
    590us/step - loss: 0.3094 - accuracy: 0.8803
262 Epoch 123/350
263 143/143 [=====] - 0s
    668us/step - loss: 0.3065 - accuracy: 0.8817
264 Epoch 124/350
265 143/143 [=====] - 0s
    619us/step - loss: 0.3071 - accuracy: 0.8793
266 Epoch 125/350
267 143/143 [=====] - 0s
    596us/step - loss: 0.3002 - accuracy: 0.8868
268 Epoch 126/350
269 143/143 [=====] - 0s
    595us/step - loss: 0.3005 - accuracy: 0.8868
270 Epoch 127/350
271 143/143 [=====] - 0s
    554us/step - loss: 0.3061 - accuracy: 0.8812
272 Epoch 128/350
273 143/143 [=====] - 0s
    707us/step - loss: 0.3010 - accuracy: 0.8831
274 Epoch 129/350
275 143/143 [=====] - 0s
    628us/step - loss: 0.2929 - accuracy: 0.8966
276 Epoch 130/350
277 143/143 [=====] - 0s
    639us/step - loss: 0.2917 - accuracy: 0.8887
278 Epoch 131/350
279 143/143 [=====] - 0s
    615us/step - loss: 0.3113 - accuracy: 0.8728
280 Epoch 132/350
281 143/143 [=====] - 0s
    554us/step - loss: 0.3139 - accuracy: 0.8779
282 Epoch 133/350
283 143/143 [=====] - 0s
    676us/step - loss: 0.2992 - accuracy: 0.8845
284 Epoch 134/350
285 143/143 [=====] - 0s
    649us/step - loss: 0.3157 - accuracy: 0.8812
286 Epoch 135/350
```

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287 143/143 [=====] - 0s
    643us/step - loss: 0.3236 - accuracy: 0.8742
288 Epoch 136/350
289 143/143 [=====] - 0s
    602us/step - loss: 0.3081 - accuracy: 0.8784
290 Epoch 137/350
291 143/143 [=====] - 0s
    570us/step - loss: 0.2906 - accuracy: 0.8943
292 Epoch 138/350
293 143/143 [=====] - 0s
    650us/step - loss: 0.2900 - accuracy: 0.8934
294 Epoch 139/350
295 143/143 [=====] - 0s
    601us/step - loss: 0.2960 - accuracy: 0.8868
296 Epoch 140/350
297 143/143 [=====] - 0s
    582us/step - loss: 0.3017 - accuracy: 0.8868
298 Epoch 141/350
299 143/143 [=====] - 0s
    619us/step - loss: 0.2959 - accuracy: 0.8920
300 Epoch 142/350
301 143/143 [=====] - 0s
    617us/step - loss: 0.3031 - accuracy: 0.8863
302 Epoch 143/350
303 143/143 [=====] - 0s
    667us/step - loss: 0.2810 - accuracy: 0.8891
304 Epoch 144/350
305 143/143 [=====] - 0s
    596us/step - loss: 0.2880 - accuracy: 0.8868
306 Epoch 145/350
307 143/143 [=====] - 0s
    584us/step - loss: 0.2744 - accuracy: 0.8994
308 Epoch 146/350
309 143/143 [=====] - 0s
    633us/step - loss: 0.2860 - accuracy: 0.8901
310 Epoch 147/350
311 143/143 [=====] - 0s
    568us/step - loss: 0.3068 - accuracy: 0.8812
312 Epoch 148/350
313 143/143 [=====] - 0s
    660us/step - loss: 0.2981 - accuracy: 0.8877
314 Epoch 149/350
315 143/143 [=====] - 0s
    601us/step - loss: 0.2889 - accuracy: 0.8882
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316 Epoch 150/350
317 143/143 [=====] - 0s
    601us/step - loss: 0.2864 - accuracy: 0.8868
318 Epoch 151/350
319 143/143 [=====] - 0s
    629us/step - loss: 0.2949 - accuracy: 0.8873
320 Epoch 152/350
321 143/143 [=====] - 0s
    595us/step - loss: 0.2851 - accuracy: 0.8863
322 Epoch 153/350
323 143/143 [=====] - 0s
    658us/step - loss: 0.2939 - accuracy: 0.8826
324 Epoch 154/350
325 143/143 [=====] - 0s
    629us/step - loss: 0.3034 - accuracy: 0.8868
326 Epoch 155/350
327 143/143 [=====] - 0s
    642us/step - loss: 0.3128 - accuracy: 0.8821
328 Epoch 156/350
329 143/143 [=====] - 0s
    631us/step - loss: 0.2824 - accuracy: 0.8887
330 Epoch 157/350
331 143/143 [=====] - 0s
    606us/step - loss: 0.2927 - accuracy: 0.8849
332 Epoch 158/350
333 143/143 [=====] - 0s
    671us/step - loss: 0.2890 - accuracy: 0.8873
334 Epoch 159/350
335 143/143 [=====] - 0s
    600us/step - loss: 0.2829 - accuracy: 0.8924
336 Epoch 160/350
337 143/143 [=====] - 0s
    577us/step - loss: 0.2741 - accuracy: 0.8976
338 Epoch 161/350
339 143/143 [=====] - 0s
    615us/step - loss: 0.2770 - accuracy: 0.8980
340 Epoch 162/350
341 143/143 [=====] - 0s
    568us/step - loss: 0.2881 - accuracy: 0.8962
342 Epoch 163/350
343 143/143 [=====] - 0s
    643us/step - loss: 0.2794 - accuracy: 0.8863
344 Epoch 164/350
345 143/143 [=====] - 0s
```

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345 641us/step - loss: 0.2763 - accuracy: 0.9013
346 Epoch 165/350
347 143/143 [=====] - 0s
    608us/step - loss: 0.2841 - accuracy: 0.8929
348 Epoch 166/350
349 143/143 [=====] - 0s
    607us/step - loss: 0.2743 - accuracy: 0.8943
350 Epoch 167/350
351 143/143 [=====] - 0s
    573us/step - loss: 0.2763 - accuracy: 0.8934
352 Epoch 168/350
353 143/143 [=====] - 0s
    629us/step - loss: 0.2907 - accuracy: 0.8924
354 Epoch 169/350
355 143/143 [=====] - 0s
    656us/step - loss: 0.2847 - accuracy: 0.8976
356 Epoch 170/350
357 143/143 [=====] - 0s
    596us/step - loss: 0.2651 - accuracy: 0.8943
358 Epoch 171/350
359 143/143 [=====] - 0s
    583us/step - loss: 0.2960 - accuracy: 0.8910
360 Epoch 172/350
361 143/143 [=====] - 0s
    573us/step - loss: 0.2731 - accuracy: 0.8924
362 Epoch 173/350
363 143/143 [=====] - 0s
    701us/step - loss: 0.2739 - accuracy: 0.8952
364 Epoch 174/350
365 143/143 [=====] - 0s
    606us/step - loss: 0.2684 - accuracy: 0.8971
366 Epoch 175/350
367 143/143 [=====] - 0s
    590us/step - loss: 0.2871 - accuracy: 0.8896
368 Epoch 176/350
369 143/143 [=====] - 0s
    599us/step - loss: 0.2724 - accuracy: 0.8934
370 Epoch 177/350
371 143/143 [=====] - 0s
    581us/step - loss: 0.2696 - accuracy: 0.8971
372 Epoch 178/350
373 143/143 [=====] - 0s
    658us/step - loss: 0.2707 - accuracy: 0.8994
374 Epoch 179/350
```

```
375 143/143 [=====] - 0s
    592us/step - loss: 0.2589 - accuracy: 0.9004
376 Epoch 180/350
377 143/143 [=====] - 0s
    600us/step - loss: 0.2852 - accuracy: 0.8873
378 Epoch 181/350
379 143/143 [=====] - 0s
    651us/step - loss: 0.2795 - accuracy: 0.8929
380 Epoch 182/350
381 143/143 [=====] - 0s
    579us/step - loss: 0.2566 - accuracy: 0.9027
382 Epoch 183/350
383 143/143 [=====] - 0s
    656us/step - loss: 0.2925 - accuracy: 0.8896
384 Epoch 184/350
385 143/143 [=====] - 0s
    596us/step - loss: 0.2516 - accuracy: 0.9051
386 Epoch 185/350
387 143/143 [=====] - 0s
    574us/step - loss: 0.2618 - accuracy: 0.9022
388 Epoch 186/350
389 143/143 [=====] - 0s
    641us/step - loss: 0.2886 - accuracy: 0.8924
390 Epoch 187/350
391 143/143 [=====] - 0s
    566us/step - loss: 0.2623 - accuracy: 0.8920
392 Epoch 188/350
393 143/143 [=====] - 0s
    657us/step - loss: 0.2566 - accuracy: 0.9074
394 Epoch 189/350
395 143/143 [=====] - 0s
    603us/step - loss: 0.2611 - accuracy: 0.9060
396 Epoch 190/350
397 143/143 [=====] - 0s
    591us/step - loss: 0.2693 - accuracy: 0.8924
398 Epoch 191/350
399 143/143 [=====] - 0s
    618us/step - loss: 0.2515 - accuracy: 0.9036
400 Epoch 192/350
401 143/143 [=====] - 0s
    573us/step - loss: 0.2671 - accuracy: 0.9004
402 Epoch 193/350
403 143/143 [=====] - 0s
    657us/step - loss: 0.2528 - accuracy: 0.9036
```

```
404 Epoch 194/350
405 143/143 [=====] - 0s
    604us/step - loss: 0.2825 - accuracy: 0.8934
406 Epoch 195/350
407 143/143 [=====] - 0s
    605us/step - loss: 0.2794 - accuracy: 0.8868
408 Epoch 196/350
409 143/143 [=====] - 0s
    606us/step - loss: 0.2565 - accuracy: 0.9004
410 Epoch 197/350
411 143/143 [=====] - 0s
    592us/step - loss: 0.2659 - accuracy: 0.8957
412 Epoch 198/350
413 143/143 [=====] - 0s
    645us/step - loss: 0.2607 - accuracy: 0.8994
414 Epoch 199/350
415 143/143 [=====] - 0s
    604us/step - loss: 0.2498 - accuracy: 0.9069
416 Epoch 200/350
417 143/143 [=====] - 0s
    581us/step - loss: 0.2694 - accuracy: 0.8966
418 Epoch 201/350
419 143/143 [=====] - 0s
    611us/step - loss: 0.2577 - accuracy: 0.8999
420 Epoch 202/350
421 143/143 [=====] - 0s
    576us/step - loss: 0.2562 - accuracy: 0.9051
422 Epoch 203/350
423 143/143 [=====] - 0s
    676us/step - loss: 0.2714 - accuracy: 0.8957
424 Epoch 204/350
425 143/143 [=====] - 0s
    604us/step - loss: 0.2442 - accuracy: 0.9041
426 Epoch 205/350
427 143/143 [=====] - 0s
    601us/step - loss: 0.2493 - accuracy: 0.9065
428 Epoch 206/350
429 143/143 [=====] - 0s
    608us/step - loss: 0.2511 - accuracy: 0.9055
430 Epoch 207/350
431 143/143 [=====] - 0s
    567us/step - loss: 0.2457 - accuracy: 0.9111
432 Epoch 208/350
433 143/143 [=====] - 0s
```

```
433 666us/step - loss: 0.2497 - accuracy: 0.9018
434 Epoch 209/350
435 143/143 [=====] - 0s
    612us/step - loss: 0.2434 - accuracy: 0.9111
436 Epoch 210/350
437 143/143 [=====] - 0s
    594us/step - loss: 0.2558 - accuracy: 0.8957
438 Epoch 211/350
439 143/143 [=====] - 0s
    605us/step - loss: 0.2449 - accuracy: 0.9060
440 Epoch 212/350
441 143/143 [=====] - 0s
    567us/step - loss: 0.2461 - accuracy: 0.9051
442 Epoch 213/350
443 143/143 [=====] - 0s
    652us/step - loss: 0.2534 - accuracy: 0.9074
444 Epoch 214/350
445 143/143 [=====] - 0s
    625us/step - loss: 0.2381 - accuracy: 0.9069
446 Epoch 215/350
447 143/143 [=====] - 0s
    563us/step - loss: 0.2417 - accuracy: 0.9013
448 Epoch 216/350
449 143/143 [=====] - 0s
    617us/step - loss: 0.2567 - accuracy: 0.9022
450 Epoch 217/350
451 143/143 [=====] - 0s
    596us/step - loss: 0.2602 - accuracy: 0.8985
452 Epoch 218/350
453 143/143 [=====] - 0s
    664us/step - loss: 0.2353 - accuracy: 0.9051
454 Epoch 219/350
455 143/143 [=====] - 0s
    596us/step - loss: 0.2405 - accuracy: 0.9102
456 Epoch 220/350
457 143/143 [=====] - 0s
    619us/step - loss: 0.2286 - accuracy: 0.9121
458 Epoch 221/350
459 143/143 [=====] - 0s
    605us/step - loss: 0.2421 - accuracy: 0.9083
460 Epoch 222/350
461 143/143 [=====] - 0s
    570us/step - loss: 0.2630 - accuracy: 0.9018
462 Epoch 223/350
```

```
463 143/143 [=====] - 0s
    642us/step - loss: 0.2567 - accuracy: 0.8999
464 Epoch 224/350
465 143/143 [=====] - 0s
    607us/step - loss: 0.2462 - accuracy: 0.9022
466 Epoch 225/350
467 143/143 [=====] - 0s
    605us/step - loss: 0.2532 - accuracy: 0.9032
468 Epoch 226/350
469 143/143 [=====] - 0s
    616us/step - loss: 0.2354 - accuracy: 0.9083
470 Epoch 227/350
471 143/143 [=====] - 0s
    569us/step - loss: 0.2229 - accuracy: 0.9144
472 Epoch 228/350
473 143/143 [=====] - 0s
    655us/step - loss: 0.2329 - accuracy: 0.9102
474 Epoch 229/350
475 143/143 [=====] - 0s
    606us/step - loss: 0.2371 - accuracy: 0.9088
476 Epoch 230/350
477 143/143 [=====] - 0s
    583us/step - loss: 0.2341 - accuracy: 0.9074
478 Epoch 231/350
479 143/143 [=====] - 0s
    627us/step - loss: 0.2413 - accuracy: 0.9041
480 Epoch 232/350
481 143/143 [=====] - 0s
    570us/step - loss: 0.2725 - accuracy: 0.8952
482 Epoch 233/350
483 143/143 [=====] - 0s
    655us/step - loss: 0.2308 - accuracy: 0.9107
484 Epoch 234/350
485 143/143 [=====] - 0s
    603us/step - loss: 0.2253 - accuracy: 0.9214
486 Epoch 235/350
487 143/143 [=====] - 0s
    596us/step - loss: 0.2383 - accuracy: 0.9097
488 Epoch 236/350
489 143/143 [=====] - 0s
    608us/step - loss: 0.2327 - accuracy: 0.9093
490 Epoch 237/350
491 143/143 [=====] - 0s
    592us/step - loss: 0.2268 - accuracy: 0.9163
```

```
492 Epoch 238/350
493 143/143 [=====] - 0s
    650us/step - loss: 0.2165 - accuracy: 0.9163
494 Epoch 239/350
495 143/143 [=====] - 0s
    583us/step - loss: 0.2359 - accuracy: 0.9102
496 Epoch 240/350
497 143/143 [=====] - 0s
    610us/step - loss: 0.2200 - accuracy: 0.9139
498 Epoch 241/350
499 143/143 [=====] - 0s
    642us/step - loss: 0.2284 - accuracy: 0.9163
500 Epoch 242/350
501 143/143 [=====] - 0s
    589us/step - loss: 0.2234 - accuracy: 0.9135
502 Epoch 243/350
503 143/143 [=====] - 0s
    662us/step - loss: 0.2279 - accuracy: 0.9181
504 Epoch 244/350
505 143/143 [=====] - 0s
    596us/step - loss: 0.2294 - accuracy: 0.9125
506 Epoch 245/350
507 143/143 [=====] - 0s
    581us/step - loss: 0.2382 - accuracy: 0.9125
508 Epoch 246/350
509 143/143 [=====] - 0s
    588us/step - loss: 0.2567 - accuracy: 0.9022
510 Epoch 247/350
511 143/143 [=====] - 0s
    583us/step - loss: 0.2184 - accuracy: 0.9167
512 Epoch 248/350
513 143/143 [=====] - 0s
    712us/step - loss: 0.2135 - accuracy: 0.9205
514 Epoch 249/350
515 143/143 [=====] - 0s
    608us/step - loss: 0.2169 - accuracy: 0.9107
516 Epoch 250/350
517 143/143 [=====] - 0s
    595us/step - loss: 0.2376 - accuracy: 0.9102
518 Epoch 251/350
519 143/143 [=====] - 0s
    597us/step - loss: 0.2170 - accuracy: 0.9177
520 Epoch 252/350
521 143/143 [=====] - 0s
```

```
521 568us/step - loss: 0.2169 - accuracy: 0.9069
522 Epoch 253/350
523 143/143 [=====] - 0s
    631us/step - loss: 0.2230 - accuracy: 0.9130
524 Epoch 254/350
525 143/143 [=====] - 0s
    652us/step - loss: 0.2282 - accuracy: 0.9051
526 Epoch 255/350
527 143/143 [=====] - 0s
    589us/step - loss: 0.2109 - accuracy: 0.9149
528 Epoch 256/350
529 143/143 [=====] - 0s
    598us/step - loss: 0.2076 - accuracy: 0.9191
530 Epoch 257/350
531 143/143 [=====] - 0s
    554us/step - loss: 0.2182 - accuracy: 0.9139
532 Epoch 258/350
533 143/143 [=====] - 0s
    665us/step - loss: 0.2209 - accuracy: 0.9125
534 Epoch 259/350
535 143/143 [=====] - 0s
    670us/step - loss: 0.2068 - accuracy: 0.9247
536 Epoch 260/350
537 143/143 [=====] - 0s
    594us/step - loss: 0.2275 - accuracy: 0.9065
538 Epoch 261/350
539 143/143 [=====] - 0s
    596us/step - loss: 0.2311 - accuracy: 0.9116
540 Epoch 262/350
541 143/143 [=====] - 0s
    568us/step - loss: 0.1950 - accuracy: 0.9181
542 Epoch 263/350
543 143/143 [=====] - 0s
    655us/step - loss: 0.1964 - accuracy: 0.9233
544 Epoch 264/350
545 143/143 [=====] - 0s
    606us/step - loss: 0.2458 - accuracy: 0.9069
546 Epoch 265/350
547 143/143 [=====] - 0s
    619us/step - loss: 0.2184 - accuracy: 0.9177
548 Epoch 266/350
549 143/143 [=====] - 0s
    605us/step - loss: 0.2007 - accuracy: 0.9200
550 Epoch 267/350
```

```
551 143/143 [=====] - 0s
    566us/step - loss: 0.2100 - accuracy: 0.9130
552 Epoch 268/350
553 143/143 [=====] - 0s
    635us/step - loss: 0.2150 - accuracy: 0.9177
554 Epoch 269/350
555 143/143 [=====] - 0s
    613us/step - loss: 0.2149 - accuracy: 0.9205
556 Epoch 270/350
557 143/143 [=====] - 0s
    560us/step - loss: 0.2229 - accuracy: 0.9135
558 Epoch 271/350
559 143/143 [=====] - 0s
    639us/step - loss: 0.1979 - accuracy: 0.9228
560 Epoch 272/350
561 143/143 [=====] - 0s
    604us/step - loss: 0.2083 - accuracy: 0.9172
562 Epoch 273/350
563 143/143 [=====] - 0s
    655us/step - loss: 0.2159 - accuracy: 0.9224
564 Epoch 274/350
565 143/143 [=====] - 0s
    601us/step - loss: 0.2078 - accuracy: 0.9200
566 Epoch 275/350
567 143/143 [=====] - 0s
    573us/step - loss: 0.2062 - accuracy: 0.9158
568 Epoch 276/350
569 143/143 [=====] - 0s
    633us/step - loss: 0.2051 - accuracy: 0.9214
570 Epoch 277/350
571 143/143 [=====] - 0s
    569us/step - loss: 0.1930 - accuracy: 0.9205
572 Epoch 278/350
573 143/143 [=====] - 0s
    653us/step - loss: 0.2017 - accuracy: 0.9181
574 Epoch 279/350
575 143/143 [=====] - 0s
    605us/step - loss: 0.2046 - accuracy: 0.9186
576 Epoch 280/350
577 143/143 [=====] - 0s
    572us/step - loss: 0.2101 - accuracy: 0.9167
578 Epoch 281/350
579 143/143 [=====] - 0s
    609us/step - loss: 0.2042 - accuracy: 0.9210
```

```
580 Epoch 282/350
581 143/143 [=====] - 0s
    587us/step - loss: 0.1967 - accuracy: 0.9219
582 Epoch 283/350
583 143/143 [=====] - 0s
    680us/step - loss: 0.2081 - accuracy: 0.9181
584 Epoch 284/350
585 143/143 [=====] - 0s
    600us/step - loss: 0.2034 - accuracy: 0.9163
586 Epoch 285/350
587 143/143 [=====] - 0s
    590us/step - loss: 0.1929 - accuracy: 0.9219
588 Epoch 286/350
589 143/143 [=====] - 0s
    603us/step - loss: 0.1937 - accuracy: 0.9242
590 Epoch 287/350
591 143/143 [=====] - 0s
    565us/step - loss: 0.1992 - accuracy: 0.9210
592 Epoch 288/350
593 143/143 [=====] - 0s
    668us/step - loss: 0.1982 - accuracy: 0.9172
594 Epoch 289/350
595 143/143 [=====] - 0s
    594us/step - loss: 0.1894 - accuracy: 0.9214
596 Epoch 290/350
597 143/143 [=====] - 0s
    633us/step - loss: 0.2036 - accuracy: 0.9191
598 Epoch 291/350
599 143/143 [=====] - 0s
    612us/step - loss: 0.2170 - accuracy: 0.9116
600 Epoch 292/350
601 143/143 [=====] - 0s
    564us/step - loss: 0.1990 - accuracy: 0.9177
602 Epoch 293/350
603 143/143 [=====] - 0s
    678us/step - loss: 0.2239 - accuracy: 0.9102
604 Epoch 294/350
605 143/143 [=====] - 0s
    592us/step - loss: 0.1922 - accuracy: 0.9261
606 Epoch 295/350
607 143/143 [=====] - 0s
    610us/step - loss: 0.1809 - accuracy: 0.9326
608 Epoch 296/350
609 143/143 [=====] - 0s
```

```
609 644us/step - loss: 0.1775 - accuracy: 0.9294
610 Epoch 297/350
611 143/143 [=====] - 0s
    566us/step - loss: 0.1914 - accuracy: 0.9200
612 Epoch 298/350
613 143/143 [=====] - 0s
    657us/step - loss: 0.1839 - accuracy: 0.9247
614 Epoch 299/350
615 143/143 [=====] - 0s
    671us/step - loss: 0.1842 - accuracy: 0.9289
616 Epoch 300/350
617 143/143 [=====] - 0s
    596us/step - loss: 0.1932 - accuracy: 0.9261
618 Epoch 301/350
619 143/143 [=====] - 0s
    579us/step - loss: 0.2108 - accuracy: 0.9149
620 Epoch 302/350
621 143/143 [=====] - 0s
    581us/step - loss: 0.1900 - accuracy: 0.9247
622 Epoch 303/350
623 143/143 [=====] - 0s
    693us/step - loss: 0.1711 - accuracy: 0.9331
624 Epoch 304/350
625 143/143 [=====] - 0s
    614us/step - loss: 0.1991 - accuracy: 0.9210
626 Epoch 305/350
627 143/143 [=====] - 0s
    579us/step - loss: 0.1837 - accuracy: 0.9322
628 Epoch 306/350
629 143/143 [=====] - 0s
    602us/step - loss: 0.1777 - accuracy: 0.9252
630 Epoch 307/350
631 143/143 [=====] - 0s
    596us/step - loss: 0.2118 - accuracy: 0.9191
632 Epoch 308/350
633 143/143 [=====] - 0s
    657us/step - loss: 0.1867 - accuracy: 0.9228
634 Epoch 309/350
635 143/143 [=====] - 0s
    601us/step - loss: 0.1759 - accuracy: 0.9294
636 Epoch 310/350
637 143/143 [=====] - 0s
    617us/step - loss: 0.2189 - accuracy: 0.9074
638 Epoch 311/350
```

```
639 143/143 [=====] - 0s
    602us/step - loss: 0.1646 - accuracy: 0.9387
640 Epoch 312/350
641 143/143 [=====] - 0s
    567us/step - loss: 0.1887 - accuracy: 0.9252
642 Epoch 313/350
643 143/143 [=====] - 0s
    652us/step - loss: 0.1845 - accuracy: 0.9247
644 Epoch 314/350
645 143/143 [=====] - 0s
    604us/step - loss: 0.1815 - accuracy: 0.9317
646 Epoch 315/350
647 143/143 [=====] - 0s
    593us/step - loss: 0.1753 - accuracy: 0.9280
648 Epoch 316/350
649 143/143 [=====] - 0s
    637us/step - loss: 0.1742 - accuracy: 0.9284
650 Epoch 317/350
651 143/143 [=====] - 0s
    567us/step - loss: 0.1801 - accuracy: 0.9280
652 Epoch 318/350
653 143/143 [=====] - 0s
    650us/step - loss: 0.1834 - accuracy: 0.9247
654 Epoch 319/350
655 143/143 [=====] - 0s
    601us/step - loss: 0.1763 - accuracy: 0.9298
656 Epoch 320/350
657 143/143 [=====] - 0s
    592us/step - loss: 0.1757 - accuracy: 0.9326
658 Epoch 321/350
659 143/143 [=====] - 0s
    625us/step - loss: 0.1752 - accuracy: 0.9270
660 Epoch 322/350
661 143/143 [=====] - 0s
    568us/step - loss: 0.1816 - accuracy: 0.9256
662 Epoch 323/350
663 143/143 [=====] - 0s
    648us/step - loss: 0.1780 - accuracy: 0.9294
664 Epoch 324/350
665 143/143 [=====] - 0s
    600us/step - loss: 0.1825 - accuracy: 0.9336
666 Epoch 325/350
667 143/143 [=====] - 0s
    585us/step - loss: 0.1861 - accuracy: 0.9294
```

```
668 Epoch 326/350
669 143/143 [=====] - 0s
    605us/step - loss: 0.1868 - accuracy: 0.9252
670 Epoch 327/350
671 143/143 [=====] - 0s
    589us/step - loss: 0.1871 - accuracy: 0.9224
672 Epoch 328/350
673 143/143 [=====] - 0s
    657us/step - loss: 0.1657 - accuracy: 0.9373
674 Epoch 329/350
675 143/143 [=====] - 0s
    592us/step - loss: 0.1765 - accuracy: 0.9308
676 Epoch 330/350
677 143/143 [=====] - 0s
    568us/step - loss: 0.1791 - accuracy: 0.9326
678 Epoch 331/350
679 143/143 [=====] - 0s
    643us/step - loss: 0.1772 - accuracy: 0.9294
680 Epoch 332/350
681 143/143 [=====] - 0s
    565us/step - loss: 0.1775 - accuracy: 0.9261
682 Epoch 333/350
683 143/143 [=====] - 0s
    673us/step - loss: 0.1565 - accuracy: 0.9355
684 Epoch 334/350
685 143/143 [=====] - 0s
    584us/step - loss: 0.1564 - accuracy: 0.9420
686 Epoch 335/350
687 143/143 [=====] - 0s
    599us/step - loss: 0.1561 - accuracy: 0.9425
688 Epoch 336/350
689 143/143 [=====] - 0s
    614us/step - loss: 0.1595 - accuracy: 0.9383
690 Epoch 337/350
691 143/143 [=====] - 0s
    566us/step - loss: 0.1964 - accuracy: 0.9261
692 Epoch 338/350
693 143/143 [=====] - 0s
    666us/step - loss: 0.1652 - accuracy: 0.9387
694 Epoch 339/350
695 143/143 [=====] - 0s
    612us/step - loss: 0.1710 - accuracy: 0.9312
696 Epoch 340/350
697 143/143 [=====] - 0s
```

```
697 593us/step - loss: 0.1841 - accuracy: 0.9261
698 Epoch 341/350
699 143/143 [=====] - 0s
    608us/step - loss: 0.2057 - accuracy: 0.9186
700 Epoch 342/350
701 143/143 [=====] - 0s
    564us/step - loss: 0.1867 - accuracy: 0.9205
702 Epoch 343/350
703 143/143 [=====] - 0s
    649us/step - loss: 0.1791 - accuracy: 0.9312
704 Epoch 344/350
705 143/143 [=====] - 0s
    627us/step - loss: 0.1668 - accuracy: 0.9289
706 Epoch 345/350
707 143/143 [=====] - 0s
    590us/step - loss: 0.1774 - accuracy: 0.9303
708 Epoch 346/350
709 143/143 [=====] - 0s
    606us/step - loss: 0.1468 - accuracy: 0.9392
710 Epoch 347/350
711 143/143 [=====] - 0s
    568us/step - loss: 0.1776 - accuracy: 0.9256
712 Epoch 348/350
713 143/143 [=====] - 0s
    638us/step - loss: 0.1548 - accuracy: 0.9411
714 Epoch 349/350
715 143/143 [=====] - 0s
    610us/step - loss: 0.1403 - accuracy: 0.9443
716 Epoch 350/350
717 143/143 [=====] - 0s
    621us/step - loss: 0.1783 - accuracy: 0.9280
718 WARNING:tensorflow:From /Library/Frameworks/Python
.framework/Versions/3.8/lib/python3.8/site-
packages/tensorflow/python/training/tracking/
tracking.py:111: Model.state_updates (from
tensorflow.python.keras.engine.training) is
deprecated and will be removed in a future version
.
719 Instructions for updating:
720 This property should not be used in TensorFlow 2.0
, as updates are applied automatically.
721 2020-09-03 19:25:21.300064: W tensorflow/python/
util/util.cc:348] Sets are not currently
considered sequences, but this may change in the
```

```
721 future, so consider avoiding using them.  
722 WARNING:tensorflow:From /Library/Frameworks/Python  
.framework/Versions/3.8/lib/python3.8/site-  
packages/tensorflow/python/training/tracking/  
tracking.py:111: Layer.updates (from tensorflow.  
python.keras.engine.base_layer) is deprecated and  
will be removed in a future version.  
723 Instructions for updating:  
724 This property should not be used in TensorFlow 2.0  
, as updates are applied automatically.  
725  
726 Process finished with exit code 0  
727
```