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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 2020-09-04 00:47:25.173540: 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 2020-09-04 00:47:25.183003: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x7fdf6b910c40 initialized for platform Host (this does not guarantee that XLA will be used). Devices:
5 2020-09-04 00:47:25.183012: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
6 Epoch 1/500
7 136/136 [=====] - 0s 590us /step - loss: 1.4744 - accuracy: 0.4078
8 Epoch 2/500
9 136/136 [=====] - 0s 549us /step - loss: 1.0797 - accuracy: 0.6324
10 Epoch 3/500
11 136/136 [=====] - 0s 569us /step - loss: 0.7808 - accuracy: 0.7377
12 Epoch 4/500
13 136/136 [=====] - 0s 540us /step - loss: 0.6622 - accuracy: 0.7740
14 Epoch 5/500
15 136/136 [=====] - 0s 540us /step - loss: 0.6168 - accuracy: 0.7755
16 Epoch 6/500
17 136/136 [=====] - 0s 568us /step - loss: 0.5993 - accuracy: 0.7838
18 Epoch 7/500
19 136/136 [=====] - 0s 565us /step - loss: 0.5781 - accuracy: 0.7907
20 Epoch 8/500
21 136/136 [=====] - 0s 559us /step - loss: 0.5624 - accuracy: 0.7926
22 Epoch 9/500
23 136/136 [=====] - 0s 591us
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23 /step - loss: 0.5649 - accuracy: 0.7887
24 Epoch 10/500
25 136/136 [=====] - 0s 586us
    /step - loss: 0.5527 - accuracy: 0.7951
26 Epoch 11/500
27 136/136 [=====] - 0s 536us
    /step - loss: 0.5413 - accuracy: 0.7990
28 Epoch 12/500
29 136/136 [=====] - 0s 726us
    /step - loss: 0.5396 - accuracy: 0.8142
30 Epoch 13/500
31 136/136 [=====] - 0s 682us
    /step - loss: 0.5173 - accuracy: 0.8167
32 Epoch 14/500
33 136/136 [=====] - 0s 592us
    /step - loss: 0.5208 - accuracy: 0.8230
34 Epoch 15/500
35 136/136 [=====] - 0s 565us
    /step - loss: 0.5104 - accuracy: 0.8152
36 Epoch 16/500
37 136/136 [=====] - 0s 528us
    /step - loss: 0.5095 - accuracy: 0.8098
38 Epoch 17/500
39 136/136 [=====] - 0s 556us
    /step - loss: 0.4996 - accuracy: 0.8186
40 Epoch 18/500
41 136/136 [=====] - 0s 628us
    /step - loss: 0.4943 - accuracy: 0.8225
42 Epoch 19/500
43 136/136 [=====] - 0s 533us
    /step - loss: 0.4839 - accuracy: 0.8260
44 Epoch 20/500
45 136/136 [=====] - 0s 649us
    /step - loss: 0.4770 - accuracy: 0.8324
46 Epoch 21/500
47 136/136 [=====] - 0s 836us
    /step - loss: 0.4906 - accuracy: 0.8245
48 Epoch 22/500
49 136/136 [=====] - 0s 582us
    /step - loss: 0.4771 - accuracy: 0.8314
50 Epoch 23/500
51 136/136 [=====] - 0s 576us
    /step - loss: 0.4737 - accuracy: 0.8373
52 Epoch 24/500
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53 136/136 [=====] - 0s 552us
  /step - loss: 0.4662 - accuracy: 0.8309
54 Epoch 25/500
55 136/136 [=====] - 0s 691us
  /step - loss: 0.4595 - accuracy: 0.8358
56 Epoch 26/500
57 136/136 [=====] - 0s 613us
  /step - loss: 0.4613 - accuracy: 0.8289
58 Epoch 27/500
59 136/136 [=====] - 0s 549us
  /step - loss: 0.4646 - accuracy: 0.8309
60 Epoch 28/500
61 136/136 [=====] - 0s 604us
  /step - loss: 0.4532 - accuracy: 0.8431
62 Epoch 29/500
63 136/136 [=====] - 0s 547us
  /step - loss: 0.4462 - accuracy: 0.8343
64 Epoch 30/500
65 136/136 [=====] - 0s 667us
  /step - loss: 0.4425 - accuracy: 0.8412
66 Epoch 31/500
67 136/136 [=====] - 0s 652us
  /step - loss: 0.4381 - accuracy: 0.8417
68 Epoch 32/500
69 136/136 [=====] - 0s 554us
  /step - loss: 0.4487 - accuracy: 0.8333
70 Epoch 33/500
71 136/136 [=====] - 0s 592us
  /step - loss: 0.4272 - accuracy: 0.8490
72 Epoch 34/500
73 136/136 [=====] - 0s 548us
  /step - loss: 0.4437 - accuracy: 0.8299
74 Epoch 35/500
75 136/136 [=====] - 0s 569us
  /step - loss: 0.4440 - accuracy: 0.8402
76 Epoch 36/500
77 136/136 [=====] - 0s 600us
  /step - loss: 0.4322 - accuracy: 0.8348
78 Epoch 37/500
79 136/136 [=====] - 0s 562us
  /step - loss: 0.4263 - accuracy: 0.8451
80 Epoch 38/500
81 136/136 [=====] - 0s 633us
  /step - loss: 0.4255 - accuracy: 0.8397
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82 Epoch 39/500
83 136/136 [=====] - 0s
    562us/step - loss: 0.4217 - accuracy: 0.8485
84 Epoch 40/500
85 136/136 [=====] - 0s
    537us/step - loss: 0.4214 - accuracy: 0.8480
86 Epoch 41/500
87 136/136 [=====] - 0s
    618us/step - loss: 0.4226 - accuracy: 0.8451
88 Epoch 42/500
89 136/136 [=====] - 0s
    563us/step - loss: 0.4153 - accuracy: 0.8515
90 Epoch 43/500
91 136/136 [=====] - 0s
    537us/step - loss: 0.4177 - accuracy: 0.8451
92 Epoch 44/500
93 136/136 [=====] - 0s
    675us/step - loss: 0.4099 - accuracy: 0.8475
94 Epoch 45/500
95 136/136 [=====] - 0s
    577us/step - loss: 0.4075 - accuracy: 0.8544
96 Epoch 46/500
97 136/136 [=====] - 0s
    538us/step - loss: 0.4186 - accuracy: 0.8461
98 Epoch 47/500
99 136/136 [=====] - 0s
    622us/step - loss: 0.4224 - accuracy: 0.8436
100 Epoch 48/500
101 136/136 [=====] - 0s
    562us/step - loss: 0.4235 - accuracy: 0.8441
102 Epoch 49/500
103 136/136 [=====] - 0s
    539us/step - loss: 0.4050 - accuracy: 0.8505
104 Epoch 50/500
105 136/136 [=====] - 0s
    621us/step - loss: 0.4051 - accuracy: 0.8603
106 Epoch 51/500
107 136/136 [=====] - 0s
    583us/step - loss: 0.3943 - accuracy: 0.8544
108 Epoch 52/500
109 136/136 [=====] - 0s
    535us/step - loss: 0.4045 - accuracy: 0.8534
110 Epoch 53/500
111 136/136 [=====] - 0s
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111 621us/step - loss: 0.3963 - accuracy: 0.8520
112 Epoch 54/500
113 136/136 [=====] - 0s
    562us/step - loss: 0.3972 - accuracy: 0.8559
114 Epoch 55/500
115 136/136 [=====] - 0s
    535us/step - loss: 0.3945 - accuracy: 0.8505
116 Epoch 56/500
117 136/136 [=====] - 0s
    616us/step - loss: 0.4049 - accuracy: 0.8480
118 Epoch 57/500
119 136/136 [=====] - 0s
    590us/step - loss: 0.3811 - accuracy: 0.8623
120 Epoch 58/500
121 136/136 [=====] - 0s
    538us/step - loss: 0.4001 - accuracy: 0.8510
122 Epoch 59/500
123 136/136 [=====] - 0s
    617us/step - loss: 0.3999 - accuracy: 0.8539
124 Epoch 60/500
125 136/136 [=====] - 0s
    562us/step - loss: 0.3998 - accuracy: 0.8598
126 Epoch 61/500
127 136/136 [=====] - 0s
    534us/step - loss: 0.3859 - accuracy: 0.8515
128 Epoch 62/500
129 136/136 [=====] - 0s
    621us/step - loss: 0.3897 - accuracy: 0.8603
130 Epoch 63/500
131 136/136 [=====] - 0s
    583us/step - loss: 0.3962 - accuracy: 0.8539
132 Epoch 64/500
133 136/136 [=====] - 0s
    536us/step - loss: 0.3925 - accuracy: 0.8539
134 Epoch 65/500
135 136/136 [=====] - 0s
    621us/step - loss: 0.3815 - accuracy: 0.8598
136 Epoch 66/500
137 136/136 [=====] - 0s
    557us/step - loss: 0.3823 - accuracy: 0.8598
138 Epoch 67/500
139 136/136 [=====] - 0s
    541us/step - loss: 0.3841 - accuracy: 0.8539
140 Epoch 68/500
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141 136/136 [=====] - 0s
    624us/step - loss: 0.3791 - accuracy: 0.8608
142 Epoch 69/500
143 136/136 [=====] - 0s
    591us/step - loss: 0.3964 - accuracy: 0.8569
144 Epoch 70/500
145 136/136 [=====] - 0s
    539us/step - loss: 0.3755 - accuracy: 0.8578
146 Epoch 71/500
147 136/136 [=====] - 0s
    640us/step - loss: 0.3695 - accuracy: 0.8686
148 Epoch 72/500
149 136/136 [=====] - 0s
    562us/step - loss: 0.3808 - accuracy: 0.8559
150 Epoch 73/500
151 136/136 [=====] - 0s
    535us/step - loss: 0.3790 - accuracy: 0.8559
152 Epoch 74/500
153 136/136 [=====] - 0s
    615us/step - loss: 0.3947 - accuracy: 0.8588
154 Epoch 75/500
155 136/136 [=====] - 0s
    553us/step - loss: 0.3808 - accuracy: 0.8583
156 Epoch 76/500
157 136/136 [=====] - 0s
    560us/step - loss: 0.3779 - accuracy: 0.8603
158 Epoch 77/500
159 136/136 [=====] - 0s
    615us/step - loss: 0.3785 - accuracy: 0.8627
160 Epoch 78/500
161 136/136 [=====] - 0s
    565us/step - loss: 0.3768 - accuracy: 0.8613
162 Epoch 79/500
163 136/136 [=====] - 0s
    538us/step - loss: 0.3678 - accuracy: 0.8657
164 Epoch 80/500
165 136/136 [=====] - 0s
    618us/step - loss: 0.3743 - accuracy: 0.8667
166 Epoch 81/500
167 136/136 [=====] - 0s
    563us/step - loss: 0.3704 - accuracy: 0.8613
168 Epoch 82/500
169 136/136 [=====] - 0s
    556us/step - loss: 0.3758 - accuracy: 0.8583
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170 Epoch 83/500
171 136/136 [=====] - 0s
    620us/step - loss: 0.3721 - accuracy: 0.8618
172 Epoch 84/500
173 136/136 [=====] - 0s
    558us/step - loss: 0.3639 - accuracy: 0.8623
174 Epoch 85/500
175 136/136 [=====] - 0s
    538us/step - loss: 0.3749 - accuracy: 0.8623
176 Epoch 86/500
177 136/136 [=====] - 0s
    621us/step - loss: 0.3631 - accuracy: 0.8681
178 Epoch 87/500
179 136/136 [=====] - 0s
    562us/step - loss: 0.3639 - accuracy: 0.8642
180 Epoch 88/500
181 136/136 [=====] - 0s
    554us/step - loss: 0.3734 - accuracy: 0.8613
182 Epoch 89/500
183 136/136 [=====] - 0s
    619us/step - loss: 0.3818 - accuracy: 0.8569
184 Epoch 90/500
185 136/136 [=====] - 0s
    566us/step - loss: 0.3762 - accuracy: 0.8583
186 Epoch 91/500
187 136/136 [=====] - 0s
    536us/step - loss: 0.3620 - accuracy: 0.8662
188 Epoch 92/500
189 136/136 [=====] - 0s
    606us/step - loss: 0.3569 - accuracy: 0.8686
190 Epoch 93/500
191 136/136 [=====] - 0s
    560us/step - loss: 0.3620 - accuracy: 0.8686
192 Epoch 94/500
193 136/136 [=====] - 0s
    556us/step - loss: 0.3613 - accuracy: 0.8627
194 Epoch 95/500
195 136/136 [=====] - 0s
    644us/step - loss: 0.3549 - accuracy: 0.8647
196 Epoch 96/500
197 136/136 [=====] - 0s
    553us/step - loss: 0.3625 - accuracy: 0.8632
198 Epoch 97/500
199 136/136 [=====] - 0s
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199 527us/step - loss: 0.3610 - accuracy: 0.8701
200 Epoch 98/500
201 136/136 [=====] - 0s
    616us/step - loss: 0.3628 - accuracy: 0.8657
202 Epoch 99/500
203 136/136 [=====] - 0s
    569us/step - loss: 0.3655 - accuracy: 0.8613
204 Epoch 100/500
205 136/136 [=====] - 0s
    515us/step - loss: 0.3528 - accuracy: 0.8711
206 Epoch 101/500
207 136/136 [=====] - 0s
    630us/step - loss: 0.3577 - accuracy: 0.8706
208 Epoch 102/500
209 136/136 [=====] - 0s
    565us/step - loss: 0.3605 - accuracy: 0.8647
210 Epoch 103/500
211 136/136 [=====] - 0s
    540us/step - loss: 0.3563 - accuracy: 0.8706
212 Epoch 104/500
213 136/136 [=====] - 0s
    618us/step - loss: 0.3581 - accuracy: 0.8637
214 Epoch 105/500
215 136/136 [=====] - 0s
    563us/step - loss: 0.3525 - accuracy: 0.8706
216 Epoch 106/500
217 136/136 [=====] - 0s
    522us/step - loss: 0.3562 - accuracy: 0.8721
218 Epoch 107/500
219 136/136 [=====] - 0s
    632us/step - loss: 0.3557 - accuracy: 0.8676
220 Epoch 108/500
221 136/136 [=====] - 0s
    583us/step - loss: 0.3579 - accuracy: 0.8686
222 Epoch 109/500
223 136/136 [=====] - 0s
    544us/step - loss: 0.3553 - accuracy: 0.8686
224 Epoch 110/500
225 136/136 [=====] - 0s
    617us/step - loss: 0.3547 - accuracy: 0.8686
226 Epoch 111/500
227 136/136 [=====] - 0s
    565us/step - loss: 0.3652 - accuracy: 0.8647
228 Epoch 112/500
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229 136/136 [=====] - 0s
    537us/step - loss: 0.3489 - accuracy: 0.8745
230 Epoch 113/500
231 136/136 [=====] - 0s
    622us/step - loss: 0.3471 - accuracy: 0.8701
232 Epoch 114/500
233 136/136 [=====] - 0s
    604us/step - loss: 0.3596 - accuracy: 0.8672
234 Epoch 115/500
235 136/136 [=====] - 0s
    539us/step - loss: 0.3579 - accuracy: 0.8740
236 Epoch 116/500
237 136/136 [=====] - 0s
    624us/step - loss: 0.3749 - accuracy: 0.8652
238 Epoch 117/500
239 136/136 [=====] - 0s
    558us/step - loss: 0.3517 - accuracy: 0.8686
240 Epoch 118/500
241 136/136 [=====] - 0s
    540us/step - loss: 0.3455 - accuracy: 0.8696
242 Epoch 119/500
243 136/136 [=====] - 0s
    615us/step - loss: 0.3450 - accuracy: 0.8676
244 Epoch 120/500
245 136/136 [=====] - 0s
    589us/step - loss: 0.3371 - accuracy: 0.8725
246 Epoch 121/500
247 136/136 [=====] - 0s
    539us/step - loss: 0.3456 - accuracy: 0.8701
248 Epoch 122/500
249 136/136 [=====] - 0s
    619us/step - loss: 0.3678 - accuracy: 0.8623
250 Epoch 123/500
251 136/136 [=====] - 0s
    558us/step - loss: 0.3452 - accuracy: 0.8740
252 Epoch 124/500
253 136/136 [=====] - 0s
    539us/step - loss: 0.3513 - accuracy: 0.8716
254 Epoch 125/500
255 136/136 [=====] - 0s
    619us/step - loss: 0.3485 - accuracy: 0.8701
256 Epoch 126/500
257 136/136 [=====] - 0s
    588us/step - loss: 0.3615 - accuracy: 0.8642
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258 Epoch 127/500
259 136/136 [=====] - 0s
    540us/step - loss: 0.3462 - accuracy: 0.8706
260 Epoch 128/500
261 136/136 [=====] - 0s
    619us/step - loss: 0.3508 - accuracy: 0.8691
262 Epoch 129/500
263 136/136 [=====] - 0s
    562us/step - loss: 0.3364 - accuracy: 0.8735
264 Epoch 130/500
265 136/136 [=====] - 0s
    535us/step - loss: 0.3509 - accuracy: 0.8676
266 Epoch 131/500
267 136/136 [=====] - 0s
    619us/step - loss: 0.3485 - accuracy: 0.8716
268 Epoch 132/500
269 136/136 [=====] - 0s
    589us/step - loss: 0.3424 - accuracy: 0.8662
270 Epoch 133/500
271 136/136 [=====] - 0s
    537us/step - loss: 0.3453 - accuracy: 0.8740
272 Epoch 134/500
273 136/136 [=====] - 0s
    621us/step - loss: 0.3437 - accuracy: 0.8716
274 Epoch 135/500
275 136/136 [=====] - 0s
    565us/step - loss: 0.3325 - accuracy: 0.8735
276 Epoch 136/500
277 136/136 [=====] - 0s
    538us/step - loss: 0.3270 - accuracy: 0.8794
278 Epoch 137/500
279 136/136 [=====] - 0s
    619us/step - loss: 0.3392 - accuracy: 0.8750
280 Epoch 138/500
281 136/136 [=====] - 0s
    562us/step - loss: 0.3316 - accuracy: 0.8760
282 Epoch 139/500
283 136/136 [=====] - 0s
    562us/step - loss: 0.3436 - accuracy: 0.8657
284 Epoch 140/500
285 136/136 [=====] - 0s
    617us/step - loss: 0.3363 - accuracy: 0.8725
286 Epoch 141/500
287 136/136 [=====] - 0s
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287 559us/step - loss: 0.3321 - accuracy: 0.8721
288 Epoch 142/500
289 136/136 [=====] - 0s
    528us/step - loss: 0.3381 - accuracy: 0.8721
290 Epoch 143/500
291 136/136 [=====] - 0s
    613us/step - loss: 0.3406 - accuracy: 0.8789
292 Epoch 144/500
293 136/136 [=====] - 0s
    569us/step - loss: 0.3369 - accuracy: 0.8711
294 Epoch 145/500
295 136/136 [=====] - 0s
    563us/step - loss: 0.3314 - accuracy: 0.8794
296 Epoch 146/500
297 136/136 [=====] - 0s
    617us/step - loss: 0.3296 - accuracy: 0.8804
298 Epoch 147/500
299 136/136 [=====] - 0s
    565us/step - loss: 0.3356 - accuracy: 0.8735
300 Epoch 148/500
301 136/136 [=====] - 0s
    537us/step - loss: 0.3366 - accuracy: 0.8784
302 Epoch 149/500
303 136/136 [=====] - 0s
    619us/step - loss: 0.3292 - accuracy: 0.8814
304 Epoch 150/500
305 136/136 [=====] - 0s
    563us/step - loss: 0.3286 - accuracy: 0.8770
306 Epoch 151/500
307 136/136 [=====] - 0s
    557us/step - loss: 0.3350 - accuracy: 0.8819
308 Epoch 152/500
309 136/136 [=====] - 0s
    618us/step - loss: 0.3306 - accuracy: 0.8755
310 Epoch 153/500
311 136/136 [=====] - 0s
    564us/step - loss: 0.3285 - accuracy: 0.8765
312 Epoch 154/500
313 136/136 [=====] - 0s
    538us/step - loss: 0.3326 - accuracy: 0.8750
314 Epoch 155/500
315 136/136 [=====] - 0s
    616us/step - loss: 0.3319 - accuracy: 0.8804
316 Epoch 156/500
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317 136/136 [=====] - 0s
    567us/step - loss: 0.3337 - accuracy: 0.8745
318 Epoch 157/500
319 136/136 [=====] - 0s
    551us/step - loss: 0.3285 - accuracy: 0.8730
320 Epoch 158/500
321 136/136 [=====] - 0s
    621us/step - loss: 0.3362 - accuracy: 0.8735
322 Epoch 159/500
323 136/136 [=====] - 0s
    561us/step - loss: 0.3248 - accuracy: 0.8814
324 Epoch 160/500
325 136/136 [=====] - 0s
    537us/step - loss: 0.3300 - accuracy: 0.8814
326 Epoch 161/500
327 136/136 [=====] - 0s
    614us/step - loss: 0.3151 - accuracy: 0.8828
328 Epoch 162/500
329 136/136 [=====] - 0s
    567us/step - loss: 0.3240 - accuracy: 0.8863
330 Epoch 163/500
331 136/136 [=====] - 0s
    523us/step - loss: 0.3273 - accuracy: 0.8814
332 Epoch 164/500
333 136/136 [=====] - 0s
    648us/step - loss: 0.3135 - accuracy: 0.8755
334 Epoch 165/500
335 136/136 [=====] - 0s
    587us/step - loss: 0.3240 - accuracy: 0.8828
336 Epoch 166/500
337 136/136 [=====] - 0s
    537us/step - loss: 0.3281 - accuracy: 0.8740
338 Epoch 167/500
339 136/136 [=====] - 0s
    616us/step - loss: 0.3154 - accuracy: 0.8848
340 Epoch 168/500
341 136/136 [=====] - 0s
    551us/step - loss: 0.3174 - accuracy: 0.8853
342 Epoch 169/500
343 136/136 [=====] - 0s
    556us/step - loss: 0.3198 - accuracy: 0.8750
344 Epoch 170/500
345 136/136 [=====] - 0s
    651us/step - loss: 0.3232 - accuracy: 0.8775
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346 Epoch 171/500
347 136/136 [=====] - 0s
      569us/step - loss: 0.3109 - accuracy: 0.8824
348 Epoch 172/500
349 136/136 [=====] - 0s
      535us/step - loss: 0.3196 - accuracy: 0.8814
350 Epoch 173/500
351 136/136 [=====] - 0s
      619us/step - loss: 0.3301 - accuracy: 0.8750
352 Epoch 174/500
353 136/136 [=====] - 0s
      563us/step - loss: 0.3225 - accuracy: 0.8804
354 Epoch 175/500
355 136/136 [=====] - 0s
      539us/step - loss: 0.3330 - accuracy: 0.8760
356 Epoch 176/500
357 136/136 [=====] - 0s
      642us/step - loss: 0.3190 - accuracy: 0.8775
358 Epoch 177/500
359 136/136 [=====] - 0s
      566us/step - loss: 0.3140 - accuracy: 0.8804
360 Epoch 178/500
361 136/136 [=====] - 0s
      532us/step - loss: 0.3203 - accuracy: 0.8770
362 Epoch 179/500
363 136/136 [=====] - 0s
      622us/step - loss: 0.3164 - accuracy: 0.8809
364 Epoch 180/500
365 136/136 [=====] - 0s
      559us/step - loss: 0.3212 - accuracy: 0.8745
366 Epoch 181/500
367 136/136 [=====] - 0s
      531us/step - loss: 0.3126 - accuracy: 0.8819
368 Epoch 182/500
369 136/136 [=====] - 0s
      668us/step - loss: 0.3310 - accuracy: 0.8784
370 Epoch 183/500
371 136/136 [=====] - 0s
      596us/step - loss: 0.3126 - accuracy: 0.8804
372 Epoch 184/500
373 136/136 [=====] - 0s
      537us/step - loss: 0.3208 - accuracy: 0.8789
374 Epoch 185/500
375 136/136 [=====] - 0s
```

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375 618us/step - loss: 0.3171 - accuracy: 0.8814
376 Epoch 186/500
377 136/136 [=====] - 0s
      560us/step - loss: 0.3073 - accuracy: 0.8902
378 Epoch 187/500
379 136/136 [=====] - 0s
      536us/step - loss: 0.3227 - accuracy: 0.8789
380 Epoch 188/500
381 136/136 [=====] - 0s
      617us/step - loss: 0.3123 - accuracy: 0.8804
382 Epoch 189/500
383 136/136 [=====] - 0s
      587us/step - loss: 0.3053 - accuracy: 0.8765
384 Epoch 190/500
385 136/136 [=====] - 0s
      533us/step - loss: 0.3049 - accuracy: 0.8858
386 Epoch 191/500
387 136/136 [=====] - 0s
      615us/step - loss: 0.3253 - accuracy: 0.8740
388 Epoch 192/500
389 136/136 [=====] - 0s
      562us/step - loss: 0.3055 - accuracy: 0.8897
390 Epoch 193/500
391 136/136 [=====] - 0s
      532us/step - loss: 0.3123 - accuracy: 0.8833
392 Epoch 194/500
393 136/136 [=====] - 0s
      616us/step - loss: 0.3125 - accuracy: 0.8809
394 Epoch 195/500
395 136/136 [=====] - 0s
      585us/step - loss: 0.3173 - accuracy: 0.8824
396 Epoch 196/500
397 136/136 [=====] - 0s
      533us/step - loss: 0.3044 - accuracy: 0.8833
398 Epoch 197/500
399 136/136 [=====] - 0s
      612us/step - loss: 0.3051 - accuracy: 0.8858
400 Epoch 198/500
401 136/136 [=====] - 0s
      560us/step - loss: 0.3189 - accuracy: 0.8755
402 Epoch 199/500
403 136/136 [=====] - 0s
      535us/step - loss: 0.3175 - accuracy: 0.8789
404 Epoch 200/500
```

```
405 136/136 [=====] - 0s
    604us/step - loss: 0.3219 - accuracy: 0.8779
406 Epoch 201/500
407 136/136 [=====] - 0s
    584us/step - loss: 0.3048 - accuracy: 0.8863
408 Epoch 202/500
409 136/136 [=====] - 0s
    540us/step - loss: 0.3206 - accuracy: 0.8765
410 Epoch 203/500
411 136/136 [=====] - 0s
    619us/step - loss: 0.3029 - accuracy: 0.8843
412 Epoch 204/500
413 136/136 [=====] - 0s
    565us/step - loss: 0.3138 - accuracy: 0.8779
414 Epoch 205/500
415 136/136 [=====] - 0s
    534us/step - loss: 0.3094 - accuracy: 0.8868
416 Epoch 206/500
417 136/136 [=====] - 0s
    616us/step - loss: 0.3012 - accuracy: 0.8877
418 Epoch 207/500
419 136/136 [=====] - 0s
    563us/step - loss: 0.2959 - accuracy: 0.8877
420 Epoch 208/500
421 136/136 [=====] - 0s
    560us/step - loss: 0.2999 - accuracy: 0.8912
422 Epoch 209/500
423 136/136 [=====] - 0s
    616us/step - loss: 0.3107 - accuracy: 0.8853
424 Epoch 210/500
425 136/136 [=====] - 0s
    560us/step - loss: 0.3001 - accuracy: 0.8907
426 Epoch 211/500
427 136/136 [=====] - 0s
    532us/step - loss: 0.3006 - accuracy: 0.8868
428 Epoch 212/500
429 136/136 [=====] - 0s
    616us/step - loss: 0.2972 - accuracy: 0.8926
430 Epoch 213/500
431 136/136 [=====] - 0s
    560us/step - loss: 0.2923 - accuracy: 0.8912
432 Epoch 214/500
433 136/136 [=====] - 0s
    557us/step - loss: 0.2986 - accuracy: 0.8868
```

```
434 Epoch 215/500
435 136/136 [=====] - 0s
    617us/step - loss: 0.3027 - accuracy: 0.8936
436 Epoch 216/500
437 136/136 [=====] - 0s
    559us/step - loss: 0.3073 - accuracy: 0.8824
438 Epoch 217/500
439 136/136 [=====] - 0s
    532us/step - loss: 0.2929 - accuracy: 0.8907
440 Epoch 218/500
441 136/136 [=====] - 0s
    616us/step - loss: 0.2999 - accuracy: 0.8863
442 Epoch 219/500
443 136/136 [=====] - 0s
    567us/step - loss: 0.2904 - accuracy: 0.8877
444 Epoch 220/500
445 136/136 [=====] - 0s
    550us/step - loss: 0.3006 - accuracy: 0.8897
446 Epoch 221/500
447 136/136 [=====] - 0s
    621us/step - loss: 0.2936 - accuracy: 0.8897
448 Epoch 222/500
449 136/136 [=====] - 0s
    561us/step - loss: 0.2919 - accuracy: 0.8892
450 Epoch 223/500
451 136/136 [=====] - 0s
    533us/step - loss: 0.2957 - accuracy: 0.8892
452 Epoch 224/500
453 136/136 [=====] - 0s
    615us/step - loss: 0.2966 - accuracy: 0.8892
454 Epoch 225/500
455 136/136 [=====] - 0s
    561us/step - loss: 0.3024 - accuracy: 0.8863
456 Epoch 226/500
457 136/136 [=====] - 0s
    532us/step - loss: 0.2951 - accuracy: 0.8853
458 Epoch 227/500
459 136/136 [=====] - 0s
    656us/step - loss: 0.2944 - accuracy: 0.8931
460 Epoch 228/500
461 136/136 [=====] - 0s
    564us/step - loss: 0.2997 - accuracy: 0.8877
462 Epoch 229/500
463 136/136 [=====] - 0s
```

```
463 538us/step - loss: 0.3028 - accuracy: 0.8853
464 Epoch 230/500
465 136/136 [=====] - 0s
    619us/step - loss: 0.2986 - accuracy: 0.8941
466 Epoch 231/500
467 136/136 [=====] - 0s
    559us/step - loss: 0.2976 - accuracy: 0.8858
468 Epoch 232/500
469 136/136 [=====] - 0s
    530us/step - loss: 0.2913 - accuracy: 0.8907
470 Epoch 233/500
471 136/136 [=====] - 0s
    650us/step - loss: 0.2844 - accuracy: 0.8931
472 Epoch 234/500
473 136/136 [=====] - 0s
    558us/step - loss: 0.2934 - accuracy: 0.8922
474 Epoch 235/500
475 136/136 [=====] - 0s
    533us/step - loss: 0.2923 - accuracy: 0.8902
476 Epoch 236/500
477 136/136 [=====] - 0s
    613us/step - loss: 0.2908 - accuracy: 0.8931
478 Epoch 237/500
479 136/136 [=====] - 0s
    547us/step - loss: 0.3010 - accuracy: 0.8907
480 Epoch 238/500
481 136/136 [=====] - 0s
    537us/step - loss: 0.2894 - accuracy: 0.8897
482 Epoch 239/500
483 136/136 [=====] - 0s
    644us/step - loss: 0.2903 - accuracy: 0.8922
484 Epoch 240/500
485 136/136 [=====] - 0s
    584us/step - loss: 0.3001 - accuracy: 0.8858
486 Epoch 241/500
487 136/136 [=====] - 0s
    536us/step - loss: 0.2882 - accuracy: 0.8912
488 Epoch 242/500
489 136/136 [=====] - 0s
    623us/step - loss: 0.2814 - accuracy: 0.8941
490 Epoch 243/500
491 136/136 [=====] - 0s
    565us/step - loss: 0.2970 - accuracy: 0.8877
492 Epoch 244/500
```

```
493 136/136 [=====] - 0s
    535us/step - loss: 0.2895 - accuracy: 0.8907
494 Epoch 245/500
495 136/136 [=====] - 0s
    618us/step - loss: 0.2883 - accuracy: 0.8897
496 Epoch 246/500
497 136/136 [=====] - 0s
    597us/step - loss: 0.2965 - accuracy: 0.8936
498 Epoch 247/500
499 136/136 [=====] - 0s
    535us/step - loss: 0.2884 - accuracy: 0.8907
500 Epoch 248/500
501 136/136 [=====] - 0s
    623us/step - loss: 0.3015 - accuracy: 0.8882
502 Epoch 249/500
503 136/136 [=====] - 0s
    557us/step - loss: 0.2866 - accuracy: 0.8873
504 Epoch 250/500
505 136/136 [=====] - 0s
    533us/step - loss: 0.2878 - accuracy: 0.8917
506 Epoch 251/500
507 136/136 [=====] - 0s
    614us/step - loss: 0.2906 - accuracy: 0.8897
508 Epoch 252/500
509 136/136 [=====] - 0s
    584us/step - loss: 0.2825 - accuracy: 0.9015
510 Epoch 253/500
511 136/136 [=====] - 0s
    531us/step - loss: 0.2813 - accuracy: 0.8917
512 Epoch 254/500
513 136/136 [=====] - 0s
    612us/step - loss: 0.2869 - accuracy: 0.8902
514 Epoch 255/500
515 136/136 [=====] - 0s
    563us/step - loss: 0.2839 - accuracy: 0.8922
516 Epoch 256/500
517 136/136 [=====] - 0s
    530us/step - loss: 0.2881 - accuracy: 0.8853
518 Epoch 257/500
519 136/136 [=====] - 0s
    617us/step - loss: 0.2862 - accuracy: 0.8931
520 Epoch 258/500
521 136/136 [=====] - 0s
    581us/step - loss: 0.2932 - accuracy: 0.8912
```

```
522 Epoch 259/500
523 136/136 [=====] - 0s
    532us/step - loss: 0.2824 - accuracy: 0.8936
524 Epoch 260/500
525 136/136 [=====] - 0s
    619us/step - loss: 0.2829 - accuracy: 0.8956
526 Epoch 261/500
527 136/136 [=====] - 0s
    566us/step - loss: 0.2949 - accuracy: 0.8873
528 Epoch 262/500
529 136/136 [=====] - 0s
    531us/step - loss: 0.2858 - accuracy: 0.8931
530 Epoch 263/500
531 136/136 [=====] - 0s
    595us/step - loss: 0.2861 - accuracy: 0.8917
532 Epoch 264/500
533 136/136 [=====] - 0s
    591us/step - loss: 0.2839 - accuracy: 0.8902
534 Epoch 265/500
535 136/136 [=====] - 0s
    537us/step - loss: 0.2750 - accuracy: 0.8990
536 Epoch 266/500
537 136/136 [=====] - 0s
    614us/step - loss: 0.2845 - accuracy: 0.8902
538 Epoch 267/500
539 136/136 [=====] - 0s
    558us/step - loss: 0.2797 - accuracy: 0.8975
540 Epoch 268/500
541 136/136 [=====] - 0s
    533us/step - loss: 0.2767 - accuracy: 0.9000
542 Epoch 269/500
543 136/136 [=====] - 0s
    616us/step - loss: 0.2830 - accuracy: 0.8946
544 Epoch 270/500
545 136/136 [=====] - 0s
    570us/step - loss: 0.2766 - accuracy: 0.8971
546 Epoch 271/500
547 136/136 [=====] - 0s
    556us/step - loss: 0.2761 - accuracy: 0.8956
548 Epoch 272/500
549 136/136 [=====] - 0s
    616us/step - loss: 0.2800 - accuracy: 0.8956
550 Epoch 273/500
551 136/136 [=====] - 0s
```

```
551 565us/step - loss: 0.2885 - accuracy: 0.8897
552 Epoch 274/500
553 136/136 [=====] - 0s
    530us/step - loss: 0.2720 - accuracy: 0.8926
554 Epoch 275/500
555 136/136 [=====] - 0s
    616us/step - loss: 0.2789 - accuracy: 0.8892
556 Epoch 276/500
557 136/136 [=====] - 0s
    564us/step - loss: 0.2903 - accuracy: 0.8917
558 Epoch 277/500
559 136/136 [=====] - 0s
    554us/step - loss: 0.2819 - accuracy: 0.8966
560 Epoch 278/500
561 136/136 [=====] - 0s
    621us/step - loss: 0.2747 - accuracy: 0.8971
562 Epoch 279/500
563 136/136 [=====] - 0s
    559us/step - loss: 0.2715 - accuracy: 0.8980
564 Epoch 280/500
565 136/136 [=====] - 0s
    531us/step - loss: 0.2820 - accuracy: 0.8912
566 Epoch 281/500
567 136/136 [=====] - 0s
    612us/step - loss: 0.2786 - accuracy: 0.8922
568 Epoch 282/500
569 136/136 [=====] - 0s
    563us/step - loss: 0.2815 - accuracy: 0.8951
570 Epoch 283/500
571 136/136 [=====] - 0s
    547us/step - loss: 0.2772 - accuracy: 0.8931
572 Epoch 284/500
573 136/136 [=====] - 0s
    671us/step - loss: 0.2726 - accuracy: 0.8975
574 Epoch 285/500
575 136/136 [=====] - 0s
    565us/step - loss: 0.2802 - accuracy: 0.8926
576 Epoch 286/500
577 136/136 [=====] - 0s
    531us/step - loss: 0.2662 - accuracy: 0.8966
578 Epoch 287/500
579 136/136 [=====] - 0s
    666us/step - loss: 0.2696 - accuracy: 0.9005
580 Epoch 288/500
```

```
581 136/136 [=====] - 0s
    563us/step - loss: 0.2659 - accuracy: 0.9000
582 Epoch 289/500
583 136/136 [=====] - 0s
    530us/step - loss: 0.2773 - accuracy: 0.8912
584 Epoch 290/500
585 136/136 [=====] - 0s
    637us/step - loss: 0.2776 - accuracy: 0.8966
586 Epoch 291/500
587 136/136 [=====] - 0s
    562us/step - loss: 0.2750 - accuracy: 0.8941
588 Epoch 292/500
589 136/136 [=====] - 0s
    534us/step - loss: 0.2681 - accuracy: 0.8971
590 Epoch 293/500
591 136/136 [=====] - 0s
    613us/step - loss: 0.2676 - accuracy: 0.8951
592 Epoch 294/500
593 136/136 [=====] - 0s
    560us/step - loss: 0.2662 - accuracy: 0.8961
594 Epoch 295/500
595 136/136 [=====] - 0s
    530us/step - loss: 0.2643 - accuracy: 0.8975
596 Epoch 296/500
597 136/136 [=====] - 0s
    606us/step - loss: 0.2703 - accuracy: 0.9000
598 Epoch 297/500
599 136/136 [=====] - 0s
    592us/step - loss: 0.2618 - accuracy: 0.9025
600 Epoch 298/500
601 136/136 [=====] - 0s
    533us/step - loss: 0.2638 - accuracy: 0.9054
602 Epoch 299/500
603 136/136 [=====] - 0s
    595us/step - loss: 0.2710 - accuracy: 0.9054
604 Epoch 300/500
605 136/136 [=====] - 0s
    552us/step - loss: 0.2833 - accuracy: 0.8902
606 Epoch 301/500
607 136/136 [=====] - 0s
    545us/step - loss: 0.2700 - accuracy: 0.8961
608 Epoch 302/500
609 136/136 [=====] - 0s
    678us/step - loss: 0.2768 - accuracy: 0.8946
```

```
610 Epoch 303/500
611 136/136 [=====] - 0s
    571us/step - loss: 0.2717 - accuracy: 0.9015
612 Epoch 304/500
613 136/136 [=====] - 0s
    532us/step - loss: 0.2704 - accuracy: 0.8975
614 Epoch 305/500
615 136/136 [=====] - 0s
    615us/step - loss: 0.2637 - accuracy: 0.9010
616 Epoch 306/500
617 136/136 [=====] - 0s
    558us/step - loss: 0.2607 - accuracy: 0.8985
618 Epoch 307/500
619 136/136 [=====] - 0s
    533us/step - loss: 0.2722 - accuracy: 0.8971
620 Epoch 308/500
621 136/136 [=====] - 0s
    614us/step - loss: 0.2603 - accuracy: 0.9025
622 Epoch 309/500
623 136/136 [=====] - 0s
    582us/step - loss: 0.2708 - accuracy: 0.8980
624 Epoch 310/500
625 136/136 [=====] - 0s
    525us/step - loss: 0.2680 - accuracy: 0.8975
626 Epoch 311/500
627 136/136 [=====] - 0s
    600us/step - loss: 0.2627 - accuracy: 0.9000
628 Epoch 312/500
629 136/136 [=====] - 0s
    576us/step - loss: 0.2827 - accuracy: 0.8897
630 Epoch 313/500
631 136/136 [=====] - 0s
    544us/step - loss: 0.2564 - accuracy: 0.9064
632 Epoch 314/500
633 136/136 [=====] - 0s
    617us/step - loss: 0.2695 - accuracy: 0.8980
634 Epoch 315/500
635 136/136 [=====] - 0s
    582us/step - loss: 0.2736 - accuracy: 0.8931
636 Epoch 316/500
637 136/136 [=====] - 0s
    531us/step - loss: 0.2740 - accuracy: 0.8951
638 Epoch 317/500
639 136/136 [=====] - 0s
```

```
639 619us/step - loss: 0.2648 - accuracy: 0.9034
640 Epoch 318/500
641 136/136 [=====] - 0s
    561us/step - loss: 0.2716 - accuracy: 0.9049
642 Epoch 319/500
643 136/136 [=====] - 0s
    529us/step - loss: 0.2683 - accuracy: 0.9029
644 Epoch 320/500
645 136/136 [=====] - 0s
    614us/step - loss: 0.2672 - accuracy: 0.8971
646 Epoch 321/500
647 136/136 [=====] - 0s
    590us/step - loss: 0.2558 - accuracy: 0.9000
648 Epoch 322/500
649 136/136 [=====] - 0s
    532us/step - loss: 0.2533 - accuracy: 0.9064
650 Epoch 323/500
651 136/136 [=====] - 0s
    617us/step - loss: 0.2602 - accuracy: 0.9020
652 Epoch 324/500
653 136/136 [=====] - 0s
    560us/step - loss: 0.2597 - accuracy: 0.9000
654 Epoch 325/500
655 136/136 [=====] - 0s
    530us/step - loss: 0.2603 - accuracy: 0.8975
656 Epoch 326/500
657 136/136 [=====] - 0s
    625us/step - loss: 0.2590 - accuracy: 0.9044
658 Epoch 327/500
659 136/136 [=====] - 0s
    589us/step - loss: 0.2795 - accuracy: 0.8971
660 Epoch 328/500
661 136/136 [=====] - 0s
    533us/step - loss: 0.2612 - accuracy: 0.9059
662 Epoch 329/500
663 136/136 [=====] - 0s
    618us/step - loss: 0.2604 - accuracy: 0.9049
664 Epoch 330/500
665 136/136 [=====] - 0s
    561us/step - loss: 0.2742 - accuracy: 0.8966
666 Epoch 331/500
667 136/136 [=====] - 0s
    531us/step - loss: 0.2691 - accuracy: 0.8995
668 Epoch 332/500
```

```
669 136/136 [=====] - 0s
    653us/step - loss: 0.2648 - accuracy: 0.9000
670 Epoch 333/500
671 136/136 [=====] - 0s
    565us/step - loss: 0.2561 - accuracy: 0.9005
672 Epoch 334/500
673 136/136 [=====] - 0s
    557us/step - loss: 0.2645 - accuracy: 0.8956
674 Epoch 335/500
675 136/136 [=====] - 0s
    615us/step - loss: 0.2613 - accuracy: 0.9010
676 Epoch 336/500
677 136/136 [=====] - 0s
    558us/step - loss: 0.2481 - accuracy: 0.9137
678 Epoch 337/500
679 136/136 [=====] - 0s
    532us/step - loss: 0.2542 - accuracy: 0.9010
680 Epoch 338/500
681 136/136 [=====] - 0s
    639us/step - loss: 0.2509 - accuracy: 0.9005
682 Epoch 339/500
683 136/136 [=====] - 0s
    569us/step - loss: 0.2498 - accuracy: 0.9039
684 Epoch 340/500
685 136/136 [=====] - 0s
    551us/step - loss: 0.2618 - accuracy: 0.8995
686 Epoch 341/500
687 136/136 [=====] - 0s
    624us/step - loss: 0.2562 - accuracy: 0.9083
688 Epoch 342/500
689 136/136 [=====] - 0s
    546us/step - loss: 0.2573 - accuracy: 0.9039
690 Epoch 343/500
691 136/136 [=====] - 0s
    529us/step - loss: 0.2491 - accuracy: 0.9054
692 Epoch 344/500
693 136/136 [=====] - 0s
    637us/step - loss: 0.2649 - accuracy: 0.9049
694 Epoch 345/500
695 136/136 [=====] - 0s
    566us/step - loss: 0.2462 - accuracy: 0.9113
696 Epoch 346/500
697 136/136 [=====] - 0s
    556us/step - loss: 0.2540 - accuracy: 0.8985
```

```
698 Epoch 347/500
699 136/136 [=====] - 0s
    650us/step - loss: 0.2521 - accuracy: 0.9069
700 Epoch 348/500
701 136/136 [=====] - 0s
    552us/step - loss: 0.2564 - accuracy: 0.9010
702 Epoch 349/500
703 136/136 [=====] - 0s
    520us/step - loss: 0.2521 - accuracy: 0.9049
704 Epoch 350/500
705 136/136 [=====] - 0s
    640us/step - loss: 0.2488 - accuracy: 0.9049
706 Epoch 351/500
707 136/136 [=====] - 0s
    570us/step - loss: 0.2598 - accuracy: 0.9064
708 Epoch 352/500
709 136/136 [=====] - 0s
    542us/step - loss: 0.2453 - accuracy: 0.9074
710 Epoch 353/500
711 136/136 [=====] - 0s
    624us/step - loss: 0.2490 - accuracy: 0.9093
712 Epoch 354/500
713 136/136 [=====] - 0s
    555us/step - loss: 0.2487 - accuracy: 0.9054
714 Epoch 355/500
715 136/136 [=====] - 0s
    521us/step - loss: 0.2521 - accuracy: 0.9020
716 Epoch 356/500
717 136/136 [=====] - 0s
    617us/step - loss: 0.2497 - accuracy: 0.9078
718 Epoch 357/500
719 136/136 [=====] - 0s
    572us/step - loss: 0.2424 - accuracy: 0.9039
720 Epoch 358/500
721 136/136 [=====] - 0s
    531us/step - loss: 0.2665 - accuracy: 0.9029
722 Epoch 359/500
723 136/136 [=====] - 0s
    690us/step - loss: 0.2555 - accuracy: 0.9029
724 Epoch 360/500
725 136/136 [=====] - 0s
    568us/step - loss: 0.2469 - accuracy: 0.9108
726 Epoch 361/500
727 136/136 [=====] - 0s
```

```
727 534us/step - loss: 0.2537 - accuracy: 0.8990
728 Epoch 362/500
729 136/136 [=====] - 0s
    644us/step - loss: 0.2513 - accuracy: 0.9059
730 Epoch 363/500
731 136/136 [=====] - 0s
    559us/step - loss: 0.2540 - accuracy: 0.9010
732 Epoch 364/500
733 136/136 [=====] - 0s
    520us/step - loss: 0.2515 - accuracy: 0.9103
734 Epoch 365/500
735 136/136 [=====] - 0s
    635us/step - loss: 0.2440 - accuracy: 0.9059
736 Epoch 366/500
737 136/136 [=====] - 0s
    548us/step - loss: 0.2419 - accuracy: 0.9142
738 Epoch 367/500
739 136/136 [=====] - 0s
    518us/step - loss: 0.2401 - accuracy: 0.9118
740 Epoch 368/500
741 136/136 [=====] - 0s
    611us/step - loss: 0.2490 - accuracy: 0.9044
742 Epoch 369/500
743 136/136 [=====] - 0s
    566us/step - loss: 0.2502 - accuracy: 0.9010
744 Epoch 370/500
745 136/136 [=====] - 0s
    530us/step - loss: 0.2498 - accuracy: 0.9083
746 Epoch 371/500
747 136/136 [=====] - 0s
    634us/step - loss: 0.2484 - accuracy: 0.9054
748 Epoch 372/500
749 136/136 [=====] - 0s
    584us/step - loss: 0.2364 - accuracy: 0.9074
750 Epoch 373/500
751 136/136 [=====] - 0s
    532us/step - loss: 0.2397 - accuracy: 0.9103
752 Epoch 374/500
753 136/136 [=====] - 0s
    624us/step - loss: 0.2418 - accuracy: 0.9088
754 Epoch 375/500
755 136/136 [=====] - 0s
    564us/step - loss: 0.2459 - accuracy: 0.9000
756 Epoch 376/500
```

```
757 136/136 [=====] - 0s
    531us/step - loss: 0.2382 - accuracy: 0.9093
758 Epoch 377/500
759 136/136 [=====] - 0s
    622us/step - loss: 0.2497 - accuracy: 0.9029
760 Epoch 378/500
761 136/136 [=====] - 0s
    600us/step - loss: 0.2587 - accuracy: 0.8980
762 Epoch 379/500
763 136/136 [=====] - 0s
    536us/step - loss: 0.2406 - accuracy: 0.9064
764 Epoch 380/500
765 136/136 [=====] - 0s
    619us/step - loss: 0.2561 - accuracy: 0.9005
766 Epoch 381/500
767 136/136 [=====] - 0s
    545us/step - loss: 0.2498 - accuracy: 0.9015
768 Epoch 382/500
769 136/136 [=====] - 0s
    520us/step - loss: 0.2517 - accuracy: 0.9010
770 Epoch 383/500
771 136/136 [=====] - 0s
    602us/step - loss: 0.2492 - accuracy: 0.9020
772 Epoch 384/500
773 136/136 [=====] - 0s
    594us/step - loss: 0.2501 - accuracy: 0.9039
774 Epoch 385/500
775 136/136 [=====] - 0s
    531us/step - loss: 0.2360 - accuracy: 0.9074
776 Epoch 386/500
777 136/136 [=====] - 0s
    644us/step - loss: 0.2432 - accuracy: 0.9083
778 Epoch 387/500
779 136/136 [=====] - 0s
    565us/step - loss: 0.2389 - accuracy: 0.9113
780 Epoch 388/500
781 136/136 [=====] - 0s
    531us/step - loss: 0.2367 - accuracy: 0.9118
782 Epoch 389/500
783 136/136 [=====] - 0s
    617us/step - loss: 0.2372 - accuracy: 0.9113
784 Epoch 390/500
785 136/136 [=====] - 0s
    580us/step - loss: 0.2420 - accuracy: 0.9132
```

```
786 Epoch 391/500
787 136/136 [=====] - 0s
    533us/step - loss: 0.2372 - accuracy: 0.9142
788 Epoch 392/500
789 136/136 [=====] - 0s
    610us/step - loss: 0.2391 - accuracy: 0.9118
790 Epoch 393/500
791 136/136 [=====] - 0s
    554us/step - loss: 0.2360 - accuracy: 0.9123
792 Epoch 394/500
793 136/136 [=====] - 0s
    548us/step - loss: 0.2333 - accuracy: 0.9118
794 Epoch 395/500
795 136/136 [=====] - 0s
    609us/step - loss: 0.2389 - accuracy: 0.9127
796 Epoch 396/500
797 136/136 [=====] - 0s
    659us/step - loss: 0.2476 - accuracy: 0.9015
798 Epoch 397/500
799 136/136 [=====] - 0s
    535us/step - loss: 0.2336 - accuracy: 0.9113
800 Epoch 398/500
801 136/136 [=====] - 0s
    620us/step - loss: 0.2432 - accuracy: 0.9064
802 Epoch 399/500
803 136/136 [=====] - 0s
    559us/step - loss: 0.2442 - accuracy: 0.9078
804 Epoch 400/500
805 136/136 [=====] - 0s
    532us/step - loss: 0.2279 - accuracy: 0.9132
806 Epoch 401/500
807 136/136 [=====] - 0s
    599us/step - loss: 0.2348 - accuracy: 0.9118
808 Epoch 402/500
809 136/136 [=====] - 0s
    562us/step - loss: 0.2326 - accuracy: 0.9152
810 Epoch 403/500
811 136/136 [=====] - 0s
    566us/step - loss: 0.2262 - accuracy: 0.9157
812 Epoch 404/500
813 136/136 [=====] - 0s
    629us/step - loss: 0.2280 - accuracy: 0.9098
814 Epoch 405/500
815 136/136 [=====] - 0s
```

```
815 560us/step - loss: 0.2414 - accuracy: 0.9083
816 Epoch 406/500
817 136/136 [=====] - 0s
    532us/step - loss: 0.2374 - accuracy: 0.9088
818 Epoch 407/500
819 136/136 [=====] - 0s
    620us/step - loss: 0.2346 - accuracy: 0.9142
820 Epoch 408/500
821 136/136 [=====] - 0s
    570us/step - loss: 0.2308 - accuracy: 0.9132
822 Epoch 409/500
823 136/136 [=====] - 0s
    557us/step - loss: 0.2340 - accuracy: 0.9118
824 Epoch 410/500
825 136/136 [=====] - 0s
    617us/step - loss: 0.2343 - accuracy: 0.9127
826 Epoch 411/500
827 136/136 [=====] - 0s
    561us/step - loss: 0.2422 - accuracy: 0.9088
828 Epoch 412/500
829 136/136 [=====] - 0s
    534us/step - loss: 0.2338 - accuracy: 0.9157
830 Epoch 413/500
831 136/136 [=====] - 0s
    612us/step - loss: 0.2328 - accuracy: 0.9108
832 Epoch 414/500
833 136/136 [=====] - 0s
    567us/step - loss: 0.2410 - accuracy: 0.9093
834 Epoch 415/500
835 136/136 [=====] - 0s
    558us/step - loss: 0.2301 - accuracy: 0.9113
836 Epoch 416/500
837 136/136 [=====] - 0s
    618us/step - loss: 0.2311 - accuracy: 0.9118
838 Epoch 417/500
839 136/136 [=====] - 0s
    555us/step - loss: 0.2441 - accuracy: 0.9083
840 Epoch 418/500
841 136/136 [=====] - 0s
    534us/step - loss: 0.2334 - accuracy: 0.9201
842 Epoch 419/500
843 136/136 [=====] - 0s
    611us/step - loss: 0.2368 - accuracy: 0.9074
844 Epoch 420/500
```

```
845 136/136 [=====] - 0s
  564us/step - loss: 0.2352 - accuracy: 0.9132
846 Epoch 421/500
847 136/136 [=====] - 0s
  535us/step - loss: 0.2300 - accuracy: 0.9172
848 Epoch 422/500
849 136/136 [=====] - 0s
  645us/step - loss: 0.2333 - accuracy: 0.9162
850 Epoch 423/500
851 136/136 [=====] - 0s
  564us/step - loss: 0.2285 - accuracy: 0.9152
852 Epoch 424/500
853 136/136 [=====] - 0s
  535us/step - loss: 0.2453 - accuracy: 0.9093
854 Epoch 425/500
855 136/136 [=====] - 0s
  622us/step - loss: 0.2314 - accuracy: 0.9088
856 Epoch 426/500
857 136/136 [=====] - 0s
  562us/step - loss: 0.2283 - accuracy: 0.9127
858 Epoch 427/500
859 136/136 [=====] - 0s
  533us/step - loss: 0.2245 - accuracy: 0.9152
860 Epoch 428/500
861 136/136 [=====] - 0s
  646us/step - loss: 0.2292 - accuracy: 0.9078
862 Epoch 429/500
863 136/136 [=====] - 0s
  574us/step - loss: 0.2283 - accuracy: 0.9093
864 Epoch 430/500
865 136/136 [=====] - 0s
  530us/step - loss: 0.2243 - accuracy: 0.9132
866 Epoch 431/500
867 136/136 [=====] - 0s
  623us/step - loss: 0.2254 - accuracy: 0.9127
868 Epoch 432/500
869 136/136 [=====] - 0s
  567us/step - loss: 0.2301 - accuracy: 0.9088
870 Epoch 433/500
871 136/136 [=====] - 0s
  531us/step - loss: 0.2264 - accuracy: 0.9123
872 Epoch 434/500
873 136/136 [=====] - 0s
  639us/step - loss: 0.2351 - accuracy: 0.9113
```

```
874 Epoch 435/500
875 136/136 [=====] - 0s
      564us/step - loss: 0.2298 - accuracy: 0.9127
876 Epoch 436/500
877 136/136 [=====] - 0s
      525us/step - loss: 0.2280 - accuracy: 0.9142
878 Epoch 437/500
879 136/136 [=====] - 0s
      608us/step - loss: 0.2267 - accuracy: 0.9123
880 Epoch 438/500
881 136/136 [=====] - 0s
      576us/step - loss: 0.2248 - accuracy: 0.9157
882 Epoch 439/500
883 136/136 [=====] - 0s
      542us/step - loss: 0.2338 - accuracy: 0.9088
884 Epoch 440/500
885 136/136 [=====] - 0s
      642us/step - loss: 0.2231 - accuracy: 0.9147
886 Epoch 441/500
887 136/136 [=====] - 0s
      575us/step - loss: 0.2395 - accuracy: 0.9152
888 Epoch 442/500
889 136/136 [=====] - 0s
      534us/step - loss: 0.2269 - accuracy: 0.9152
890 Epoch 443/500
891 136/136 [=====] - 0s
      618us/step - loss: 0.2228 - accuracy: 0.9167
892 Epoch 444/500
893 136/136 [=====] - 0s
      560us/step - loss: 0.2202 - accuracy: 0.9157
894 Epoch 445/500
895 136/136 [=====] - 0s
      532us/step - loss: 0.2193 - accuracy: 0.9088
896 Epoch 446/500
897 136/136 [=====] - 0s
      592us/step - loss: 0.2167 - accuracy: 0.9157
898 Epoch 447/500
899 136/136 [=====] - 0s
      608us/step - loss: 0.2331 - accuracy: 0.9127
900 Epoch 448/500
901 136/136 [=====] - 0s
      550us/step - loss: 0.2279 - accuracy: 0.9118
902 Epoch 449/500
903 136/136 [=====] - 0s
```

```
903 599us/step - loss: 0.2375 - accuracy: 0.9132
904 Epoch 450/500
905 136/136 [=====] - 0s
    583us/step - loss: 0.2213 - accuracy: 0.9206
906 Epoch 451/500
907 136/136 [=====] - 0s
    552us/step - loss: 0.2296 - accuracy: 0.9132
908 Epoch 452/500
909 136/136 [=====] - 0s
    636us/step - loss: 0.2222 - accuracy: 0.9172
910 Epoch 453/500
911 136/136 [=====] - 0s
    583us/step - loss: 0.2270 - accuracy: 0.9167
912 Epoch 454/500
913 136/136 [=====] - 0s
    516us/step - loss: 0.2201 - accuracy: 0.9157
914 Epoch 455/500
915 136/136 [=====] - 0s
    635us/step - loss: 0.2168 - accuracy: 0.9191
916 Epoch 456/500
917 136/136 [=====] - 0s
    589us/step - loss: 0.2192 - accuracy: 0.9191
918 Epoch 457/500
919 136/136 [=====] - 0s
    550us/step - loss: 0.2266 - accuracy: 0.9181
920 Epoch 458/500
921 136/136 [=====] - 0s
    631us/step - loss: 0.2176 - accuracy: 0.9225
922 Epoch 459/500
923 136/136 [=====] - 0s
    582us/step - loss: 0.2329 - accuracy: 0.9132
924 Epoch 460/500
925 136/136 [=====] - 0s
    540us/step - loss: 0.2211 - accuracy: 0.9132
926 Epoch 461/500
927 136/136 [=====] - 0s
    624us/step - loss: 0.2168 - accuracy: 0.9201
928 Epoch 462/500
929 136/136 [=====] - 0s
    566us/step - loss: 0.2208 - accuracy: 0.9186
930 Epoch 463/500
931 136/136 [=====] - 0s
    534us/step - loss: 0.2151 - accuracy: 0.9201
932 Epoch 464/500
```

```
933 136/136 [=====] - 0s
    656us/step - loss: 0.2225 - accuracy: 0.9216
934 Epoch 465/500
935 136/136 [=====] - 0s
    589us/step - loss: 0.2272 - accuracy: 0.9137
936 Epoch 466/500
937 136/136 [=====] - 0s
    538us/step - loss: 0.2188 - accuracy: 0.9147
938 Epoch 467/500
939 136/136 [=====] - 0s
    617us/step - loss: 0.2322 - accuracy: 0.9103
940 Epoch 468/500
941 136/136 [=====] - 0s
    566us/step - loss: 0.2254 - accuracy: 0.9196
942 Epoch 469/500
943 136/136 [=====] - 0s
    526us/step - loss: 0.2226 - accuracy: 0.9157
944 Epoch 470/500
945 136/136 [=====] - 0s
    612us/step - loss: 0.2125 - accuracy: 0.9147
946 Epoch 471/500
947 136/136 [=====] - 0s
    585us/step - loss: 0.2160 - accuracy: 0.9157
948 Epoch 472/500
949 136/136 [=====] - 0s
    557us/step - loss: 0.2290 - accuracy: 0.9059
950 Epoch 473/500
951 136/136 [=====] - 0s
    613us/step - loss: 0.2165 - accuracy: 0.9132
952 Epoch 474/500
953 136/136 [=====] - 0s
    555us/step - loss: 0.2234 - accuracy: 0.9093
954 Epoch 475/500
955 136/136 [=====] - 0s
    542us/step - loss: 0.2178 - accuracy: 0.9186
956 Epoch 476/500
957 136/136 [=====] - 0s
    645us/step - loss: 0.2186 - accuracy: 0.9211
958 Epoch 477/500
959 136/136 [=====] - 0s
    565us/step - loss: 0.2318 - accuracy: 0.9108
960 Epoch 478/500
961 136/136 [=====] - 0s
    556us/step - loss: 0.2135 - accuracy: 0.9260
```

```
962 Epoch 479/500
963 136/136 [=====] - 0s
    620us/step - loss: 0.2102 - accuracy: 0.9225
964 Epoch 480/500
965 136/136 [=====] - 0s
    564us/step - loss: 0.2192 - accuracy: 0.9127
966 Epoch 481/500
967 136/136 [=====] - 0s
    540us/step - loss: 0.2090 - accuracy: 0.9225
968 Epoch 482/500
969 136/136 [=====] - 0s
    618us/step - loss: 0.2093 - accuracy: 0.9191
970 Epoch 483/500
971 136/136 [=====] - 0s
    567us/step - loss: 0.2145 - accuracy: 0.9201
972 Epoch 484/500
973 136/136 [=====] - 0s
    558us/step - loss: 0.2267 - accuracy: 0.9127
974 Epoch 485/500
975 136/136 [=====] - 0s
    617us/step - loss: 0.2282 - accuracy: 0.9147
976 Epoch 486/500
977 136/136 [=====] - 0s
    563us/step - loss: 0.2213 - accuracy: 0.9147
978 Epoch 487/500
979 136/136 [=====] - 0s
    539us/step - loss: 0.2154 - accuracy: 0.9157
980 Epoch 488/500
981 136/136 [=====] - 0s
    628us/step - loss: 0.2147 - accuracy: 0.9186
982 Epoch 489/500
983 136/136 [=====] - 0s
    564us/step - loss: 0.2237 - accuracy: 0.9142
984 Epoch 490/500
985 136/136 [=====] - 0s
    535us/step - loss: 0.2185 - accuracy: 0.9211
986 Epoch 491/500
987 136/136 [=====] - 0s
    649us/step - loss: 0.2161 - accuracy: 0.9167
988 Epoch 492/500
989 136/136 [=====] - 0s
    564us/step - loss: 0.2083 - accuracy: 0.9206
990 Epoch 493/500
991 136/136 [=====] - 0s
```

```
991 539us/step - loss: 0.2204 - accuracy: 0.9201
992 Epoch 494/500
993 136/136 [=====] - 0s
    618us/step - loss: 0.2199 - accuracy: 0.9225
994 Epoch 495/500
995 136/136 [=====] - 0s
    563us/step - loss: 0.2108 - accuracy: 0.9240
996 Epoch 496/500
997 136/136 [=====] - 0s
    539us/step - loss: 0.2141 - accuracy: 0.9216
998 Epoch 497/500
999 136/136 [=====] - 0s
    654us/step - loss: 0.2050 - accuracy: 0.9235
1000 Epoch 498/500
1001 136/136 [=====] - 0s
    574us/step - loss: 0.2143 - accuracy: 0.9245
1002 Epoch 499/500
1003 136/136 [=====] - 0s
    540us/step - loss: 0.2205 - accuracy: 0.9142
1004 Epoch 500/500
1005 136/136 [=====] - 0s
    622us/step - loss: 0.2136 - accuracy: 0.9176
1006 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.
1007 Instructions for updating:
1008 This property should not be used in TensorFlow 2.
0, as updates are applied automatically.
1009 2020-09-04 00:48:05.546645: W tensorflow/python/
util/util.cc:348] Sets are not currently
considered sequences, but this may change in the
future, so consider avoiding using them.
1010 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.
1011 Instructions for updating:
1012 This property should not be used in TensorFlow 2.
```

```
1012 0, as updates are applied automatically.  
1013  
1014 Process finished with exit code 0  
1015
```