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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 ['norm_imperVIOUS' 'tan_imperVIOUS' '
norm_imperVIOUS' ...]
3 ['norm_imperVIOUS' 'dry_pervious' 'norm_pervious']
4 [2 5 2 ... 2 0 3]
5 2020-09-03 19:21:45.514092: 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
6 To enable them in other operations, rebuild
TensorFlow with the appropriate compiler flags.
7 2020-09-03 19:21:45.525960: I tensorflow/compiler/
xla/service/service.cc:168] XLA service
0x7fd609e38170 initialized for platform Host (this
does not guarantee that XLA will be used). Devices:
8 2020-09-03 19:21:45.525975: 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 619us
/step - loss: 1.6229 - accuracy: 0.3910
20 Epoch 2/350
21 143/143 [=====] - 0s 580us
/step - loss: 1.0843 - accuracy: 0.6328
22 Epoch 3/350

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23 143/143 [=====] - 0s 662us
  /step - loss: 0.7873 - accuracy: 0.7362
24 Epoch 4/350
25 143/143 [=====] - 0s 584us
  /step - loss: 0.6896 - accuracy: 0.7638
26 Epoch 5/350
27 143/143 [=====] - 0s 583us
  /step - loss: 0.6507 - accuracy: 0.7661
28 Epoch 6/350
29 143/143 [=====] - 0s 629us
  /step - loss: 0.6072 - accuracy: 0.7825
30 Epoch 7/350
31 143/143 [=====] - 0s 582us
  /step - loss: 0.5949 - accuracy: 0.7900
32 Epoch 8/350
33 143/143 [=====] - 0s 697us
  /step - loss: 0.5719 - accuracy: 0.7979
34 Epoch 9/350
35 143/143 [=====] - 0s 656us
  /step - loss: 0.5688 - accuracy: 0.7965
36 Epoch 10/350
37 143/143 [=====] - 0s 603us
  /step - loss: 0.5671 - accuracy: 0.7909
38 Epoch 11/350
39 143/143 [=====] - 0s 766us
  /step - loss: 0.5447 - accuracy: 0.8026
40 Epoch 12/350
41 143/143 [=====] - 0s 686us
  /step - loss: 0.5453 - accuracy: 0.8040
42 Epoch 13/350
43 143/143 [=====] - 0s 651us
  /step - loss: 0.5180 - accuracy: 0.8157
44 Epoch 14/350
45 143/143 [=====] - 0s 620us
  /step - loss: 0.5456 - accuracy: 0.8012
46 Epoch 15/350
47 143/143 [=====] - 0s 668us
  /step - loss: 0.5109 - accuracy: 0.8152
48 Epoch 16/350
49 143/143 [=====] - 0s 597us
  /step - loss: 0.5098 - accuracy: 0.8101
50 Epoch 17/350
51 143/143 [=====] - 0s 595us
  /step - loss: 0.4871 - accuracy: 0.8251
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52 Epoch 18/350
53 143/143 [=====] - 0s 609us
    /step - loss: 0.4910 - accuracy: 0.8312
54 Epoch 19/350
55 143/143 [=====] - 0s 587us
    /step - loss: 0.4846 - accuracy: 0.8251
56 Epoch 20/350
57 143/143 [=====] - 0s 683us
    /step - loss: 0.4750 - accuracy: 0.8232
58 Epoch 21/350
59 143/143 [=====] - 0s 596us
    /step - loss: 0.4839 - accuracy: 0.8312
60 Epoch 22/350
61 143/143 [=====] - 0s 558us
    /step - loss: 0.4768 - accuracy: 0.8316
62 Epoch 23/350
63 143/143 [=====] - 0s 610us
    /step - loss: 0.4613 - accuracy: 0.8354
64 Epoch 24/350
65 143/143 [=====] - 0s 553us
    /step - loss: 0.4660 - accuracy: 0.8354
66 Epoch 25/350
67 143/143 [=====] - 0s 632us
    /step - loss: 0.4747 - accuracy: 0.8274
68 Epoch 26/350
69 143/143 [=====] - 0s 646us
    /step - loss: 0.4729 - accuracy: 0.8274
70 Epoch 27/350
71 143/143 [=====] - 0s 584us
    /step - loss: 0.4701 - accuracy: 0.8307
72 Epoch 28/350
73 143/143 [=====] - 0s 610us
    /step - loss: 0.4399 - accuracy: 0.8433
74 Epoch 29/350
75 143/143 [=====] - 0s 570us
    /step - loss: 0.4595 - accuracy: 0.8368
76 Epoch 30/350
77 143/143 [=====] - 0s 658us
    /step - loss: 0.4590 - accuracy: 0.8358
78 Epoch 31/350
79 143/143 [=====] - 0s 620us
    /step - loss: 0.4738 - accuracy: 0.8288
80 Epoch 32/350
81 143/143 [=====] - 0s 596us
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81 /step - loss: 0.4533 - accuracy: 0.8312
82 Epoch 33/350
83 143/143 [=====] - 0s
607us/step - loss: 0.4428 - accuracy: 0.8405
84 Epoch 34/350
85 143/143 [=====] - 0s
556us/step - loss: 0.4506 - accuracy: 0.8382
86 Epoch 35/350
87 143/143 [=====] - 0s
609us/step - loss: 0.4309 - accuracy: 0.8400
88 Epoch 36/350
89 143/143 [=====] - 0s
627us/step - loss: 0.4501 - accuracy: 0.8326
90 Epoch 37/350
91 143/143 [=====] - 0s
562us/step - loss: 0.4462 - accuracy: 0.8368
92 Epoch 38/350
93 143/143 [=====] - 0s
632us/step - loss: 0.4318 - accuracy: 0.8438
94 Epoch 39/350
95 143/143 [=====] - 0s
599us/step - loss: 0.4313 - accuracy: 0.8447
96 Epoch 40/350
97 143/143 [=====] - 0s
669us/step - loss: 0.4289 - accuracy: 0.8485
98 Epoch 41/350
99 143/143 [=====] - 0s
595us/step - loss: 0.4362 - accuracy: 0.8400
100 Epoch 42/350
101 143/143 [=====] - 0s
626us/step - loss: 0.4190 - accuracy: 0.8461
102 Epoch 43/350
103 143/143 [=====] - 0s
605us/step - loss: 0.4318 - accuracy: 0.8424
104 Epoch 44/350
105 143/143 [=====] - 0s
569us/step - loss: 0.4285 - accuracy: 0.8433
106 Epoch 45/350
107 143/143 [=====] - 0s
640us/step - loss: 0.4263 - accuracy: 0.8480
108 Epoch 46/350
109 143/143 [=====] - 0s
589us/step - loss: 0.4205 - accuracy: 0.8489
110 Epoch 47/350
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111 143/143 [=====] - 0s
    633us/step - loss: 0.4296 - accuracy: 0.8424
112 Epoch 48/350
113 143/143 [=====] - 0s
    654us/step - loss: 0.4080 - accuracy: 0.8494
114 Epoch 49/350
115 143/143 [=====] - 0s
    568us/step - loss: 0.4240 - accuracy: 0.8447
116 Epoch 50/350
117 143/143 [=====] - 0s
    659us/step - loss: 0.4231 - accuracy: 0.8480
118 Epoch 51/350
119 143/143 [=====] - 0s
    600us/step - loss: 0.4146 - accuracy: 0.8485
120 Epoch 52/350
121 143/143 [=====] - 0s
    595us/step - loss: 0.4040 - accuracy: 0.8471
122 Epoch 53/350
123 143/143 [=====] - 0s
    631us/step - loss: 0.4025 - accuracy: 0.8499
124 Epoch 54/350
125 143/143 [=====] - 0s
    571us/step - loss: 0.4267 - accuracy: 0.8508
126 Epoch 55/350
127 143/143 [=====] - 0s
    649us/step - loss: 0.4074 - accuracy: 0.8494
128 Epoch 56/350
129 143/143 [=====] - 0s
    595us/step - loss: 0.4055 - accuracy: 0.8428
130 Epoch 57/350
131 143/143 [=====] - 0s
    641us/step - loss: 0.4079 - accuracy: 0.8503
132 Epoch 58/350
133 143/143 [=====] - 0s
    622us/step - loss: 0.4098 - accuracy: 0.8466
134 Epoch 59/350
135 143/143 [=====] - 0s
    598us/step - loss: 0.4103 - accuracy: 0.8545
136 Epoch 60/350
137 143/143 [=====] - 0s
    660us/step - loss: 0.4100 - accuracy: 0.8466
138 Epoch 61/350
139 143/143 [=====] - 0s
    595us/step - loss: 0.4095 - accuracy: 0.8471
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140 Epoch 62/350
141 143/143 [=====] - 0s
    596us/step - loss: 0.3989 - accuracy: 0.8489
142 Epoch 63/350
143 143/143 [=====] - 0s
    610us/step - loss: 0.4085 - accuracy: 0.8531
144 Epoch 64/350
145 143/143 [=====] - 0s
    556us/step - loss: 0.3990 - accuracy: 0.8513
146 Epoch 65/350
147 143/143 [=====] - 0s
    702us/step - loss: 0.4080 - accuracy: 0.8489
148 Epoch 66/350
149 143/143 [=====] - 0s
    622us/step - loss: 0.4045 - accuracy: 0.8471
150 Epoch 67/350
151 143/143 [=====] - 0s
    601us/step - loss: 0.3771 - accuracy: 0.8639
152 Epoch 68/350
153 143/143 [=====] - 0s
    604us/step - loss: 0.3875 - accuracy: 0.8522
154 Epoch 69/350
155 143/143 [=====] - 0s
    573us/step - loss: 0.3829 - accuracy: 0.8545
156 Epoch 70/350
157 143/143 [=====] - 0s
    676us/step - loss: 0.3866 - accuracy: 0.8578
158 Epoch 71/350
159 143/143 [=====] - 0s
    609us/step - loss: 0.3740 - accuracy: 0.8634
160 Epoch 72/350
161 143/143 [=====] - 0s
    597us/step - loss: 0.3846 - accuracy: 0.8573
162 Epoch 73/350
163 143/143 [=====] - 0s
    609us/step - loss: 0.3735 - accuracy: 0.8620
164 Epoch 74/350
165 143/143 [=====] - 0s
    571us/step - loss: 0.3803 - accuracy: 0.8531
166 Epoch 75/350
167 143/143 [=====] - 0s
    648us/step - loss: 0.3797 - accuracy: 0.8597
168 Epoch 76/350
169 143/143 [=====] - 0s
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169 625us/step - loss: 0.3726 - accuracy: 0.8573
170 Epoch 77/350
171 143/143 [=====] - 0s
599us/step - loss: 0.3697 - accuracy: 0.8616
172 Epoch 78/350
173 143/143 [=====] - 0s
608us/step - loss: 0.4078 - accuracy: 0.8536
174 Epoch 79/350
175 143/143 [=====] - 0s
562us/step - loss: 0.3807 - accuracy: 0.8634
176 Epoch 80/350
177 143/143 [=====] - 0s
637us/step - loss: 0.3756 - accuracy: 0.8639
178 Epoch 81/350
179 143/143 [=====] - 0s
659us/step - loss: 0.3761 - accuracy: 0.8592
180 Epoch 82/350
181 143/143 [=====] - 0s
613us/step - loss: 0.3803 - accuracy: 0.8625
182 Epoch 83/350
183 143/143 [=====] - 0s
606us/step - loss: 0.3847 - accuracy: 0.8597
184 Epoch 84/350
185 143/143 [=====] - 0s
570us/step - loss: 0.3632 - accuracy: 0.8653
186 Epoch 85/350
187 143/143 [=====] - 0s
652us/step - loss: 0.3677 - accuracy: 0.8625
188 Epoch 86/350
189 143/143 [=====] - 0s
602us/step - loss: 0.3553 - accuracy: 0.8695
190 Epoch 87/350
191 143/143 [=====] - 0s
622us/step - loss: 0.3506 - accuracy: 0.8704
192 Epoch 88/350
193 143/143 [=====] - 0s
609us/step - loss: 0.3683 - accuracy: 0.8597
194 Epoch 89/350
195 143/143 [=====] - 0s
568us/step - loss: 0.3824 - accuracy: 0.8578
196 Epoch 90/350
197 143/143 [=====] - 0s
639us/step - loss: 0.3572 - accuracy: 0.8681
198 Epoch 91/350
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199 143/143 [=====] - 0s
    613us/step - loss: 0.3618 - accuracy: 0.8634
200 Epoch 92/350
201 143/143 [=====] - 0s
    569us/step - loss: 0.3734 - accuracy: 0.8578
202 Epoch 93/350
203 143/143 [=====] - 0s
    642us/step - loss: 0.3530 - accuracy: 0.8658
204 Epoch 94/350
205 143/143 [=====] - 0s
    595us/step - loss: 0.3537 - accuracy: 0.8709
206 Epoch 95/350
207 143/143 [=====] - 0s
    698us/step - loss: 0.3637 - accuracy: 0.8630
208 Epoch 96/350
209 143/143 [=====] - 0s
    597us/step - loss: 0.3552 - accuracy: 0.8700
210 Epoch 97/350
211 143/143 [=====] - 0s
    604us/step - loss: 0.3441 - accuracy: 0.8718
212 Epoch 98/350
213 143/143 [=====] - 0s
    626us/step - loss: 0.3432 - accuracy: 0.8653
214 Epoch 99/350
215 143/143 [=====] - 0s
    571us/step - loss: 0.3541 - accuracy: 0.8686
216 Epoch 100/350
217 143/143 [=====] - 0s
    662us/step - loss: 0.3521 - accuracy: 0.8765
218 Epoch 101/350
219 143/143 [=====] - 0s
    603us/step - loss: 0.3520 - accuracy: 0.8718
220 Epoch 102/350
221 143/143 [=====] - 0s
    594us/step - loss: 0.3470 - accuracy: 0.8746
222 Epoch 103/350
223 143/143 [=====] - 0s
    610us/step - loss: 0.3402 - accuracy: 0.8718
224 Epoch 104/350
225 143/143 [=====] - 0s
    593us/step - loss: 0.3355 - accuracy: 0.8704
226 Epoch 105/350
227 143/143 [=====] - 0s
    666us/step - loss: 0.3447 - accuracy: 0.8704
```

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228 Epoch 106/350
229 143/143 [=====] - 0s
    604us/step - loss: 0.3396 - accuracy: 0.8709
230 Epoch 107/350
231 143/143 [=====] - 0s
    593us/step - loss: 0.3420 - accuracy: 0.8718
232 Epoch 108/350
233 143/143 [=====] - 0s
    608us/step - loss: 0.3377 - accuracy: 0.8653
234 Epoch 109/350
235 143/143 [=====] - 0s
    573us/step - loss: 0.3317 - accuracy: 0.8732
236 Epoch 110/350
237 143/143 [=====] - 0s
    664us/step - loss: 0.3315 - accuracy: 0.8737
238 Epoch 111/350
239 143/143 [=====] - 0s
    598us/step - loss: 0.3316 - accuracy: 0.8756
240 Epoch 112/350
241 143/143 [=====] - 0s
    628us/step - loss: 0.3387 - accuracy: 0.8737
242 Epoch 113/350
243 143/143 [=====] - 0s
    607us/step - loss: 0.3289 - accuracy: 0.8812
244 Epoch 114/350
245 143/143 [=====] - 0s
    570us/step - loss: 0.3478 - accuracy: 0.8658
246 Epoch 115/350
247 143/143 [=====] - 0s
    673us/step - loss: 0.3262 - accuracy: 0.8765
248 Epoch 116/350
249 143/143 [=====] - 0s
    595us/step - loss: 0.3517 - accuracy: 0.8728
250 Epoch 117/350
251 143/143 [=====] - 0s
    623us/step - loss: 0.3427 - accuracy: 0.8616
252 Epoch 118/350
253 143/143 [=====] - 0s
    645us/step - loss: 0.3230 - accuracy: 0.8807
254 Epoch 119/350
255 143/143 [=====] - 0s
    573us/step - loss: 0.3220 - accuracy: 0.8770
256 Epoch 120/350
257 143/143 [=====] - 0s
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257 670us/step - loss: 0.3382 - accuracy: 0.8728
258 Epoch 121/350
259 143/143 [=====] - 0s
    689us/step - loss: 0.3237 - accuracy: 0.8756
260 Epoch 122/350
261 143/143 [=====] - 0s
    600us/step - loss: 0.3284 - accuracy: 0.8784
262 Epoch 123/350
263 143/143 [=====] - 0s
    604us/step - loss: 0.3381 - accuracy: 0.8681
264 Epoch 124/350
265 143/143 [=====] - 0s
    573us/step - loss: 0.3244 - accuracy: 0.8737
266 Epoch 125/350
267 143/143 [=====] - 0s
    663us/step - loss: 0.3194 - accuracy: 0.8840
268 Epoch 126/350
269 143/143 [=====] - 0s
    631us/step - loss: 0.3170 - accuracy: 0.8793
270 Epoch 127/350
271 143/143 [=====] - 0s
    600us/step - loss: 0.3108 - accuracy: 0.8859
272 Epoch 128/350
273 143/143 [=====] - 0s
    595us/step - loss: 0.3248 - accuracy: 0.8789
274 Epoch 129/350
275 143/143 [=====] - 0s
    560us/step - loss: 0.3156 - accuracy: 0.8821
276 Epoch 130/350
277 143/143 [=====] - 0s
    704us/step - loss: 0.3246 - accuracy: 0.8798
278 Epoch 131/350
279 143/143 [=====] - 0s
    605us/step - loss: 0.3261 - accuracy: 0.8756
280 Epoch 132/350
281 143/143 [=====] - 0s
    629us/step - loss: 0.3260 - accuracy: 0.8845
282 Epoch 133/350
283 143/143 [=====] - 0s
    586us/step - loss: 0.3363 - accuracy: 0.8751
284 Epoch 134/350
285 143/143 [=====] - 0s
    621us/step - loss: 0.3001 - accuracy: 0.8835
286 Epoch 135/350
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287 143/143 [=====] - 0s
    682us/step - loss: 0.3161 - accuracy: 0.8859
288 Epoch 136/350
289 143/143 [=====] - 0s
    598us/step - loss: 0.3055 - accuracy: 0.8854
290 Epoch 137/350
291 143/143 [=====] - 0s
    600us/step - loss: 0.3012 - accuracy: 0.8887
292 Epoch 138/350
293 143/143 [=====] - 0s
    625us/step - loss: 0.3159 - accuracy: 0.8779
294 Epoch 139/350
295 143/143 [=====] - 0s
    571us/step - loss: 0.3002 - accuracy: 0.8891
296 Epoch 140/350
297 143/143 [=====] - 0s
    660us/step - loss: 0.2920 - accuracy: 0.8882
298 Epoch 141/350
299 143/143 [=====] - 0s
    607us/step - loss: 0.3125 - accuracy: 0.8831
300 Epoch 142/350
301 143/143 [=====] - 0s
    583us/step - loss: 0.3117 - accuracy: 0.8831
302 Epoch 143/350
303 143/143 [=====] - 0s
    625us/step - loss: 0.3096 - accuracy: 0.8817
304 Epoch 144/350
305 143/143 [=====] - 0s
    573us/step - loss: 0.2955 - accuracy: 0.8891
306 Epoch 145/350
307 143/143 [=====] - 0s
    653us/step - loss: 0.3053 - accuracy: 0.8821
308 Epoch 146/350
309 143/143 [=====] - 0s
    605us/step - loss: 0.3016 - accuracy: 0.8901
310 Epoch 147/350
311 143/143 [=====] - 0s
    576us/step - loss: 0.3157 - accuracy: 0.8812
312 Epoch 148/350
313 143/143 [=====] - 0s
    632us/step - loss: 0.3040 - accuracy: 0.8821
314 Epoch 149/350
315 143/143 [=====] - 0s
    599us/step - loss: 0.3012 - accuracy: 0.8868
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316 Epoch 150/350
317 143/143 [=====] - 0s
    674us/step - loss: 0.3060 - accuracy: 0.8845
318 Epoch 151/350
319 143/143 [=====] - 0s
    584us/step - loss: 0.3066 - accuracy: 0.8821
320 Epoch 152/350
321 143/143 [=====] - 0s
    622us/step - loss: 0.3104 - accuracy: 0.8873
322 Epoch 153/350
323 143/143 [=====] - 0s
    633us/step - loss: 0.2987 - accuracy: 0.8803
324 Epoch 154/350
325 143/143 [=====] - 0s
    594us/step - loss: 0.2962 - accuracy: 0.8873
326 Epoch 155/350
327 143/143 [=====] - 0s
    661us/step - loss: 0.2951 - accuracy: 0.8807
328 Epoch 156/350
329 143/143 [=====] - 0s
    607us/step - loss: 0.2940 - accuracy: 0.8859
330 Epoch 157/350
331 143/143 [=====] - 0s
    597us/step - loss: 0.3016 - accuracy: 0.8877
332 Epoch 158/350
333 143/143 [=====] - 0s
    590us/step - loss: 0.2890 - accuracy: 0.8891
334 Epoch 159/350
335 143/143 [=====] - 0s
    604us/step - loss: 0.2994 - accuracy: 0.8863
336 Epoch 160/350
337 143/143 [=====] - 0s
    697us/step - loss: 0.3022 - accuracy: 0.8831
338 Epoch 161/350
339 143/143 [=====] - 0s
    582us/step - loss: 0.2939 - accuracy: 0.8887
340 Epoch 162/350
341 143/143 [=====] - 0s
    559us/step - loss: 0.2901 - accuracy: 0.8957
342 Epoch 163/350
343 143/143 [=====] - 0s
    625us/step - loss: 0.2817 - accuracy: 0.8924
344 Epoch 164/350
345 143/143 [=====] - 0s
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345 598us/step - loss: 0.2948 - accuracy: 0.8854
346 Epoch 165/350
347 143/143 [=====] - 0s
    674us/step - loss: 0.2828 - accuracy: 0.8990
348 Epoch 166/350
349 143/143 [=====] - 0s
    612us/step - loss: 0.2787 - accuracy: 0.9008
350 Epoch 167/350
351 143/143 [=====] - 0s
    601us/step - loss: 0.2905 - accuracy: 0.8901
352 Epoch 168/350
353 143/143 [=====] - 0s
    602us/step - loss: 0.2839 - accuracy: 0.8873
354 Epoch 169/350
355 143/143 [=====] - 0s
    572us/step - loss: 0.2838 - accuracy: 0.8938
356 Epoch 170/350
357 143/143 [=====] - 0s
    656us/step - loss: 0.2770 - accuracy: 0.8934
358 Epoch 171/350
359 143/143 [=====] - 0s
    625us/step - loss: 0.2800 - accuracy: 0.8952
360 Epoch 172/350
361 143/143 [=====] - 0s
    578us/step - loss: 0.2868 - accuracy: 0.8915
362 Epoch 173/350
363 143/143 [=====] - 0s
    589us/step - loss: 0.2685 - accuracy: 0.8943
364 Epoch 174/350
365 143/143 [=====] - 0s
    555us/step - loss: 0.2754 - accuracy: 0.8920
366 Epoch 175/350
367 143/143 [=====] - 0s
    615us/step - loss: 0.2735 - accuracy: 0.9013
368 Epoch 176/350
369 143/143 [=====] - 0s
    652us/step - loss: 0.2874 - accuracy: 0.8915
370 Epoch 177/350
371 143/143 [=====] - 0s
    645us/step - loss: 0.2861 - accuracy: 0.8985
372 Epoch 178/350
373 143/143 [=====] - 0s
    603us/step - loss: 0.2693 - accuracy: 0.8943
374 Epoch 179/350
```

```
375 143/143 [=====] - 0s
    570us/step - loss: 0.2715 - accuracy: 0.8962
376 Epoch 180/350
377 143/143 [=====] - 0s
    666us/step - loss: 0.2813 - accuracy: 0.8920
378 Epoch 181/350
379 143/143 [=====] - 0s
    608us/step - loss: 0.2665 - accuracy: 0.8934
380 Epoch 182/350
381 143/143 [=====] - 0s
    617us/step - loss: 0.2906 - accuracy: 0.8891
382 Epoch 183/350
383 143/143 [=====] - 0s
    619us/step - loss: 0.2864 - accuracy: 0.8920
384 Epoch 184/350
385 143/143 [=====] - 0s
    570us/step - loss: 0.2767 - accuracy: 0.8938
386 Epoch 185/350
387 143/143 [=====] - 0s
    642us/step - loss: 0.2647 - accuracy: 0.9008
388 Epoch 186/350
389 143/143 [=====] - 0s
    620us/step - loss: 0.2772 - accuracy: 0.8999
390 Epoch 187/350
391 143/143 [=====] - 0s
    599us/step - loss: 0.2764 - accuracy: 0.8976
392 Epoch 188/350
393 143/143 [=====] - 0s
    626us/step - loss: 0.2707 - accuracy: 0.8990
394 Epoch 189/350
395 143/143 [=====] - 0s
    572us/step - loss: 0.2694 - accuracy: 0.8938
396 Epoch 190/350
397 143/143 [=====] - 0s
    661us/step - loss: 0.2744 - accuracy: 0.8962
398 Epoch 191/350
399 143/143 [=====] - 0s
    604us/step - loss: 0.2625 - accuracy: 0.8980
400 Epoch 192/350
401 143/143 [=====] - 0s
    597us/step - loss: 0.2706 - accuracy: 0.8976
402 Epoch 193/350
403 143/143 [=====] - 0s
    604us/step - loss: 0.2723 - accuracy: 0.8896
```

```
404 Epoch 194/350
405 143/143 [=====] - 0s
    593us/step - loss: 0.2704 - accuracy: 0.8957
406 Epoch 195/350
407 143/143 [=====] - 0s
    655us/step - loss: 0.2553 - accuracy: 0.9041
408 Epoch 196/350
409 143/143 [=====] - 0s
    601us/step - loss: 0.2724 - accuracy: 0.8948
410 Epoch 197/350
411 143/143 [=====] - 0s
    586us/step - loss: 0.2697 - accuracy: 0.8957
412 Epoch 198/350
413 143/143 [=====] - 0s
    618us/step - loss: 0.2658 - accuracy: 0.9008
414 Epoch 199/350
415 143/143 [=====] - 0s
    588us/step - loss: 0.2573 - accuracy: 0.9041
416 Epoch 200/350
417 143/143 [=====] - 0s
    637us/step - loss: 0.2745 - accuracy: 0.8906
418 Epoch 201/350
419 143/143 [=====] - 0s
    605us/step - loss: 0.2514 - accuracy: 0.9036
420 Epoch 202/350
421 143/143 [=====] - 0s
    586us/step - loss: 0.2632 - accuracy: 0.9051
422 Epoch 203/350
423 143/143 [=====] - 0s
    634us/step - loss: 0.2443 - accuracy: 0.9036
424 Epoch 204/350
425 143/143 [=====] - 0s
    571us/step - loss: 0.2451 - accuracy: 0.9079
426 Epoch 205/350
427 143/143 [=====] - 0s
    677us/step - loss: 0.2501 - accuracy: 0.8990
428 Epoch 206/350
429 143/143 [=====] - 0s
    608us/step - loss: 0.2537 - accuracy: 0.9022
430 Epoch 207/350
431 143/143 [=====] - 0s
    605us/step - loss: 0.2530 - accuracy: 0.8985
432 Epoch 208/350
433 143/143 [=====] - 0s
```

```
433 601us/step - loss: 0.2530 - accuracy: 0.9065
434 Epoch 209/350
435 143/143 [=====] - 0s
    568us/step - loss: 0.2544 - accuracy: 0.9074
436 Epoch 210/350
437 143/143 [=====] - 0s
    651us/step - loss: 0.2629 - accuracy: 0.8962
438 Epoch 211/350
439 143/143 [=====] - 0s
    634us/step - loss: 0.2487 - accuracy: 0.9036
440 Epoch 212/350
441 143/143 [=====] - 0s
    592us/step - loss: 0.2448 - accuracy: 0.9074
442 Epoch 213/350
443 143/143 [=====] - 0s
    603us/step - loss: 0.2558 - accuracy: 0.9069
444 Epoch 214/350
445 143/143 [=====] - 0s
    568us/step - loss: 0.2453 - accuracy: 0.9022
446 Epoch 215/350
447 143/143 [=====] - 0s
    660us/step - loss: 0.2452 - accuracy: 0.9060
448 Epoch 216/350
449 143/143 [=====] - 0s
    630us/step - loss: 0.2448 - accuracy: 0.9041
450 Epoch 217/350
451 143/143 [=====] - 0s
    593us/step - loss: 0.2479 - accuracy: 0.9008
452 Epoch 218/350
453 143/143 [=====] - 0s
    596us/step - loss: 0.2400 - accuracy: 0.9097
454 Epoch 219/350
455 143/143 [=====] - 0s
    552us/step - loss: 0.2429 - accuracy: 0.9046
456 Epoch 220/350
457 143/143 [=====] - 0s
    614us/step - loss: 0.2416 - accuracy: 0.9093
458 Epoch 221/350
459 143/143 [=====] - 0s
    608us/step - loss: 0.2520 - accuracy: 0.9041
460 Epoch 222/350
461 143/143 [=====] - 0s
    613us/step - loss: 0.2400 - accuracy: 0.9051
462 Epoch 223/350
```

```
463 143/143 [=====] - 0s
    656us/step - loss: 0.2394 - accuracy: 0.9083
464 Epoch 224/350
465 143/143 [=====] - 0s
    560us/step - loss: 0.2453 - accuracy: 0.9060
466 Epoch 225/350
467 143/143 [=====] - 0s
    639us/step - loss: 0.2430 - accuracy: 0.9116
468 Epoch 226/350
469 143/143 [=====] - 0s
    583us/step - loss: 0.2497 - accuracy: 0.9022
470 Epoch 227/350
471 143/143 [=====] - 0s
    596us/step - loss: 0.2361 - accuracy: 0.9088
472 Epoch 228/350
473 143/143 [=====] - 0s
    650us/step - loss: 0.2402 - accuracy: 0.9060
474 Epoch 229/350
475 143/143 [=====] - 0s
    559us/step - loss: 0.2450 - accuracy: 0.9046
476 Epoch 230/350
477 143/143 [=====] - 0s
    697us/step - loss: 0.2268 - accuracy: 0.9139
478 Epoch 231/350
479 143/143 [=====] - 0s
    605us/step - loss: 0.2448 - accuracy: 0.9102
480 Epoch 232/350
481 143/143 [=====] - 0s
    584us/step - loss: 0.2497 - accuracy: 0.9018
482 Epoch 233/350
483 143/143 [=====] - 0s
    609us/step - loss: 0.2454 - accuracy: 0.9041
484 Epoch 234/350
485 143/143 [=====] - 0s
    620us/step - loss: 0.2354 - accuracy: 0.9135
486 Epoch 235/350
487 143/143 [=====] - 0s
    677us/step - loss: 0.2331 - accuracy: 0.9088
488 Epoch 236/350
489 143/143 [=====] - 0s
    599us/step - loss: 0.2386 - accuracy: 0.9069
490 Epoch 237/350
491 143/143 [=====] - 0s
    596us/step - loss: 0.2416 - accuracy: 0.9060
```

```
492 Epoch 238/350
493 143/143 [=====] - 0s
    604us/step - loss: 0.2296 - accuracy: 0.9121
494 Epoch 239/350
495 143/143 [=====] - 0s
    596us/step - loss: 0.2460 - accuracy: 0.9088
496 Epoch 240/350
497 143/143 [=====] - 0s
    668us/step - loss: 0.2285 - accuracy: 0.9097
498 Epoch 241/350
499 143/143 [=====] - 0s
    600us/step - loss: 0.2435 - accuracy: 0.9097
500 Epoch 242/350
501 143/143 [=====] - 0s
    599us/step - loss: 0.2240 - accuracy: 0.9158
502 Epoch 243/350
503 143/143 [=====] - 0s
    604us/step - loss: 0.2253 - accuracy: 0.9172
504 Epoch 244/350
505 143/143 [=====] - 0s
    566us/step - loss: 0.2284 - accuracy: 0.9130
506 Epoch 245/350
507 143/143 [=====] - 0s
    658us/step - loss: 0.2233 - accuracy: 0.9111
508 Epoch 246/350
509 143/143 [=====] - 0s
    622us/step - loss: 0.2268 - accuracy: 0.9135
510 Epoch 247/350
511 143/143 [=====] - 0s
    599us/step - loss: 0.2276 - accuracy: 0.9144
512 Epoch 248/350
513 143/143 [=====] - 0s
    603us/step - loss: 0.2539 - accuracy: 0.8999
514 Epoch 249/350
515 143/143 [=====] - 0s
    579us/step - loss: 0.2282 - accuracy: 0.9111
516 Epoch 250/350
517 143/143 [=====] - 0s
    681us/step - loss: 0.2309 - accuracy: 0.9065
518 Epoch 251/350
519 143/143 [=====] - 0s
    617us/step - loss: 0.2342 - accuracy: 0.9111
520 Epoch 252/350
521 143/143 [=====] - 0s
```

```
521 604us/step - loss: 0.2440 - accuracy: 0.9093
522 Epoch 253/350
523 143/143 [=====] - 0s
    618us/step - loss: 0.2196 - accuracy: 0.9172
524 Epoch 254/350
525 143/143 [=====] - 0s
    569us/step - loss: 0.2261 - accuracy: 0.9097
526 Epoch 255/350
527 143/143 [=====] - 0s
    645us/step - loss: 0.2328 - accuracy: 0.9116
528 Epoch 256/350
529 143/143 [=====] - 0s
    631us/step - loss: 0.2087 - accuracy: 0.9191
530 Epoch 257/350
531 143/143 [=====] - 0s
    596us/step - loss: 0.2220 - accuracy: 0.9153
532 Epoch 258/350
533 143/143 [=====] - 0s
    606us/step - loss: 0.2103 - accuracy: 0.9210
534 Epoch 259/350
535 143/143 [=====] - 0s
    556us/step - loss: 0.2217 - accuracy: 0.9149
536 Epoch 260/350
537 143/143 [=====] - 0s
    613us/step - loss: 0.2385 - accuracy: 0.9051
538 Epoch 261/350
539 143/143 [=====] - 0s
    611us/step - loss: 0.2133 - accuracy: 0.9153
540 Epoch 262/350
541 143/143 [=====] - 0s
    568us/step - loss: 0.2097 - accuracy: 0.9172
542 Epoch 263/350
543 143/143 [=====] - 0s
    638us/step - loss: 0.2256 - accuracy: 0.9153
544 Epoch 264/350
545 143/143 [=====] - 0s
    607us/step - loss: 0.2191 - accuracy: 0.9135
546 Epoch 265/350
547 143/143 [=====] - 0s
    659us/step - loss: 0.2417 - accuracy: 0.9102
548 Epoch 266/350
549 143/143 [=====] - 0s
    605us/step - loss: 0.2136 - accuracy: 0.9186
550 Epoch 267/350
```

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551 143/143 [=====] - 0s
    617us/step - loss: 0.2144 - accuracy: 0.9224
552 Epoch 268/350
553 143/143 [=====] - 0s
    603us/step - loss: 0.2128 - accuracy: 0.9196
554 Epoch 269/350
555 143/143 [=====] - 0s
    568us/step - loss: 0.1994 - accuracy: 0.9270
556 Epoch 270/350
557 143/143 [=====] - 0s
    635us/step - loss: 0.2029 - accuracy: 0.9242
558 Epoch 271/350
559 143/143 [=====] - 0s
    623us/step - loss: 0.2232 - accuracy: 0.9111
560 Epoch 272/350
561 143/143 [=====] - 0s
    582us/step - loss: 0.2105 - accuracy: 0.9200
562 Epoch 273/350
563 143/143 [=====] - 0s
    635us/step - loss: 0.2192 - accuracy: 0.9102
564 Epoch 274/350
565 143/143 [=====] - 0s
    569us/step - loss: 0.2140 - accuracy: 0.9210
566 Epoch 275/350
567 143/143 [=====] - 0s
    660us/step - loss: 0.2027 - accuracy: 0.9158
568 Epoch 276/350
569 143/143 [=====] - 0s
    606us/step - loss: 0.2090 - accuracy: 0.9233
570 Epoch 277/350
571 143/143 [=====] - 0s
    592us/step - loss: 0.2052 - accuracy: 0.9224
572 Epoch 278/350
573 143/143 [=====] - 0s
    586us/step - loss: 0.2317 - accuracy: 0.9018
574 Epoch 279/350
575 143/143 [=====] - 0s
    617us/step - loss: 0.2067 - accuracy: 0.9172
576 Epoch 280/350
577 143/143 [=====] - 0s
    682us/step - loss: 0.2068 - accuracy: 0.9210
578 Epoch 281/350
579 143/143 [=====] - 0s
    597us/step - loss: 0.2059 - accuracy: 0.9219
```

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580 Epoch 282/350
581 143/143 [=====] - 0s
    596us/step - loss: 0.2184 - accuracy: 0.9144
582 Epoch 283/350
583 143/143 [=====] - 0s
    608us/step - loss: 0.2102 - accuracy: 0.9242
584 Epoch 284/350
585 143/143 [=====] - 0s
    586us/step - loss: 0.2176 - accuracy: 0.9177
586 Epoch 285/350
587 143/143 [=====] - 0s
    617us/step - loss: 0.2118 - accuracy: 0.9177
588 Epoch 286/350
589 143/143 [=====] - 0s
    658us/step - loss: 0.1991 - accuracy: 0.9242
590 Epoch 287/350
591 143/143 [=====] - 0s
    619us/step - loss: 0.2065 - accuracy: 0.9224
592 Epoch 288/350
593 143/143 [=====] - 0s
    601us/step - loss: 0.2043 - accuracy: 0.9233
594 Epoch 289/350
595 143/143 [=====] - 0s
    554us/step - loss: 0.1921 - accuracy: 0.9308
596 Epoch 290/350
597 143/143 [=====] - 0s
    706us/step - loss: 0.1948 - accuracy: 0.9242
598 Epoch 291/350
599 143/143 [=====] - 0s
    635us/step - loss: 0.2086 - accuracy: 0.9200
600 Epoch 292/350
601 143/143 [=====] - 0s
    605us/step - loss: 0.1912 - accuracy: 0.9252
602 Epoch 293/350
603 143/143 [=====] - 0s
    600us/step - loss: 0.1924 - accuracy: 0.9233
604 Epoch 294/350
605 143/143 [=====] - 0s
    569us/step - loss: 0.1933 - accuracy: 0.9219
606 Epoch 295/350
607 143/143 [=====] - 0s
    659us/step - loss: 0.2006 - accuracy: 0.9228
608 Epoch 296/350
609 143/143 [=====] - 0s
```

```
609 614us/step - loss: 0.1850 - accuracy: 0.9298
610 Epoch 297/350
611 143/143 [=====] - 0s
    597us/step - loss: 0.1991 - accuracy: 0.9256
612 Epoch 298/350
613 143/143 [=====] - 0s
    603us/step - loss: 0.2033 - accuracy: 0.9200
614 Epoch 299/350
615 143/143 [=====] - 0s
    565us/step - loss: 0.1948 - accuracy: 0.9205
616 Epoch 300/350
617 143/143 [=====] - 0s
    655us/step - loss: 0.2223 - accuracy: 0.9210
618 Epoch 301/350
619 143/143 [=====] - 0s
    629us/step - loss: 0.1914 - accuracy: 0.9233
620 Epoch 302/350
621 143/143 [=====] - 0s
    598us/step - loss: 0.1800 - accuracy: 0.9261
622 Epoch 303/350
623 143/143 [=====] - 0s
    623us/step - loss: 0.1797 - accuracy: 0.9303
624 Epoch 304/350
625 143/143 [=====] - 0s
    572us/step - loss: 0.1971 - accuracy: 0.9228
626 Epoch 305/350
627 143/143 [=====] - 0s
    648us/step - loss: 0.1786 - accuracy: 0.9280
628 Epoch 306/350
629 143/143 [=====] - 0s
    603us/step - loss: 0.2016 - accuracy: 0.9228
630 Epoch 307/350
631 143/143 [=====] - 0s
    623us/step - loss: 0.1890 - accuracy: 0.9233
632 Epoch 308/350
633 143/143 [=====] - 0s
    611us/step - loss: 0.1993 - accuracy: 0.9219
634 Epoch 309/350
635 143/143 [=====] - 0s
    567us/step - loss: 0.1887 - accuracy: 0.9303
636 Epoch 310/350
637 143/143 [=====] - 0s
    652us/step - loss: 0.2072 - accuracy: 0.9163
638 Epoch 311/350
```

```
639 143/143 [=====] - 0s
    603us/step - loss: 0.1818 - accuracy: 0.9294
640 Epoch 312/350
641 143/143 [=====] - 0s
    598us/step - loss: 0.1912 - accuracy: 0.9200
642 Epoch 313/350
643 143/143 [=====] - 0s
    626us/step - loss: 0.1707 - accuracy: 0.9289
644 Epoch 314/350
645 143/143 [=====] - 0s
    568us/step - loss: 0.2027 - accuracy: 0.9191
646 Epoch 315/350
647 143/143 [=====] - 0s
    658us/step - loss: 0.1952 - accuracy: 0.9196
648 Epoch 316/350
649 143/143 [=====] - 0s
    606us/step - loss: 0.1924 - accuracy: 0.9270
650 Epoch 317/350
651 143/143 [=====] - 0s
    595us/step - loss: 0.1873 - accuracy: 0.9261
652 Epoch 318/350
653 143/143 [=====] - 0s
    628us/step - loss: 0.2098 - accuracy: 0.9200
654 Epoch 319/350
655 143/143 [=====] - 0s
    569us/step - loss: 0.1897 - accuracy: 0.9275
656 Epoch 320/350
657 143/143 [=====] - 0s
    657us/step - loss: 0.1850 - accuracy: 0.9252
658 Epoch 321/350
659 143/143 [=====] - 0s
    605us/step - loss: 0.1746 - accuracy: 0.9275
660 Epoch 322/350
661 143/143 [=====] - 0s
    595us/step - loss: 0.1916 - accuracy: 0.9252
662 Epoch 323/350
663 143/143 [=====] - 0s
    608us/step - loss: 0.1743 - accuracy: 0.9242
664 Epoch 324/350
665 143/143 [=====] - 0s
    594us/step - loss: 0.1764 - accuracy: 0.9322
666 Epoch 325/350
667 143/143 [=====] - 0s
    647us/step - loss: 0.1797 - accuracy: 0.9261
```

```
668 Epoch 326/350
669 143/143 [=====] - 0s
      592us/step - loss: 0.1845 - accuracy: 0.9247
670 Epoch 327/350
671 143/143 [=====] - 0s
      615us/step - loss: 0.1776 - accuracy: 0.9284
672 Epoch 328/350
673 143/143 [=====] - 0s
      635us/step - loss: 0.1695 - accuracy: 0.9336
674 Epoch 329/350
675 143/143 [=====] - 0s
      608us/step - loss: 0.1694 - accuracy: 0.9350
676 Epoch 330/350
677 143/143 [=====] - 0s
      689us/step - loss: 0.1727 - accuracy: 0.9289
678 Epoch 331/350
679 143/143 [=====] - 0s
      604us/step - loss: 0.1869 - accuracy: 0.9252
680 Epoch 332/350
681 143/143 [=====] - 0s
      601us/step - loss: 0.1764 - accuracy: 0.9303
682 Epoch 333/350
683 143/143 [=====] - 0s
      601us/step - loss: 0.1858 - accuracy: 0.9266
684 Epoch 334/350
685 143/143 [=====] - 0s
      569us/step - loss: 0.1623 - accuracy: 0.9322
686 Epoch 335/350
687 143/143 [=====] - 0s
      689us/step - loss: 0.1690 - accuracy: 0.9322
688 Epoch 336/350
689 143/143 [=====] - 0s
      602us/step - loss: 0.1660 - accuracy: 0.9341
690 Epoch 337/350
691 143/143 [=====] - 0s
      578us/step - loss: 0.1806 - accuracy: 0.9252
692 Epoch 338/350
693 143/143 [=====] - 0s
      644us/step - loss: 0.1938 - accuracy: 0.9284
694 Epoch 339/350
695 143/143 [=====] - 0s
      581us/step - loss: 0.1735 - accuracy: 0.9317
696 Epoch 340/350
697 143/143 [=====] - 0s
```

```
697 676us/step - loss: 0.1569 - accuracy: 0.9364
698 Epoch 341/350
699 143/143 [=====] - 0s
    611us/step - loss: 0.1549 - accuracy: 0.9453
700 Epoch 342/350
701 143/143 [=====] - 0s
    594us/step - loss: 0.1911 - accuracy: 0.9289
702 Epoch 343/350
703 143/143 [=====] - 0s
    609us/step - loss: 0.2080 - accuracy: 0.9247
704 Epoch 344/350
705 143/143 [=====] - 0s
    566us/step - loss: 0.1711 - accuracy: 0.9308
706 Epoch 345/350
707 143/143 [=====] - 0s
    656us/step - loss: 0.1661 - accuracy: 0.9369
708 Epoch 346/350
709 143/143 [=====] - 0s
    628us/step - loss: 0.1681 - accuracy: 0.9308
710 Epoch 347/350
711 143/143 [=====] - 0s
    596us/step - loss: 0.1705 - accuracy: 0.9298
712 Epoch 348/350
713 143/143 [=====] - 0s
    603us/step - loss: 0.1595 - accuracy: 0.9378
714 Epoch 349/350
715 143/143 [=====] - 0s
    556us/step - loss: 0.1606 - accuracy: 0.9345
716 Epoch 350/350
717 143/143 [=====] - 0s
    629us/step - loss: 0.1736 - accuracy: 0.9331
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 19:22:17.341009: 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
```