

In this exercise you'll try to build a neural network that predicts the price of a house according to a simple formula.

So, imagine if house pricing was as easy as a house costs 50k + 50k per bedroom, so that a 1 bedroom house costs 100k, a 2 bedroom house costs 150k etc.

How would you create a neural network that learns this relationship so that it would predict a 7 bedroom house as costing close to 400k etc.

Hint: Your network might work better if you scale the house price down. You don't have to give the answer 400...it might be better to create something that predicts the number 4, and then your answer is in the 'hundreds of thousands' etc.

In [6]:

```
import tensorflow as tf
import numpy as np
from tensorflow import keras
```

In [7]:

```
# GRADED FUNCTION: house_model
def house_model(y_new):
    xs = np.array([1.0, 2.0, 3.0, 4.0, 5.0, 6.0], dtype = float)
    ys = np.array([100, 150, 200, 250, 300, 350], dtype = float)
    model = tf.keras.Sequential([keras.layers.Dense(units = 1 , input_shape =[1
    ])])
    model.compile(optimizer = 'sgd', loss='mean_squared_error')
    model.fit(xs, ys/100, epochs=1000)
    return model.predict(y_new)[0]
```

In []:

```
prediction = house_model([7.0])  
print(prediction)
```

Epoch 1/1000
6/6 [=====] - 0s 32ms/sample - loss: 0.0483
Epoch 2/1000
6/6 [=====] - 0s 346us/sample - loss: 0.047
7
Epoch 3/1000
6/6 [=====] - 0s 268us/sample - loss: 0.047
3
Epoch 4/1000
6/6 [=====] - 0s 299us/sample - loss: 0.046
9
Epoch 5/1000
6/6 [=====] - 0s 385us/sample - loss: 0.046
5
Epoch 6/1000
6/6 [=====] - 0s 321us/sample - loss: 0.046
2
Epoch 7/1000
6/6 [=====] - 0s 268us/sample - loss: 0.045
8
Epoch 8/1000
6/6 [=====] - 0s 357us/sample - loss: 0.045
5
Epoch 9/1000
6/6 [=====] - 0s 335us/sample - loss: 0.045
1
Epoch 10/1000
6/6 [=====] - 0s 315us/sample - loss: 0.044
8
Epoch 11/1000
6/6 [=====] - 0s 13ms/sample - loss: 0.0445
Epoch 12/1000
6/6 [=====] - 0s 318us/sample - loss: 0.044
2
Epoch 13/1000
6/6 [=====] - 0s 296us/sample - loss: 0.043
8
Epoch 14/1000
6/6 [=====] - 0s 266us/sample - loss: 0.043
5
Epoch 15/1000
6/6 [=====] - 0s 399us/sample - loss: 0.043
2
Epoch 16/1000
6/6 [=====] - 0s 289us/sample - loss: 0.042
9
Epoch 17/1000
6/6 [=====] - 0s 297us/sample - loss: 0.042
6
Epoch 18/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0423
Epoch 19/1000
6/6 [=====] - 0s 333us/sample - loss: 0.042
0
Epoch 20/1000
6/6 [=====] - 0s 317us/sample - loss: 0.041
7
Epoch 21/1000
6/6 [=====] - 0s 370us/sample - loss: 0.041
4
Epoch 22/1000

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6/6 [=====] - 0s 344us/sample - loss: 0.041
1
Epoch 23/1000
6/6 [=====] - 0s 292us/sample - loss: 0.040
8
Epoch 24/1000
6/6 [=====] - 0s 294us/sample - loss: 0.040
5
Epoch 25/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0402
Epoch 26/1000
6/6 [=====] - 0s 354us/sample - loss: 0.039
9
Epoch 27/1000
6/6 [=====] - 0s 304us/sample - loss: 0.039
6
Epoch 28/1000
6/6 [=====] - 0s 343us/sample - loss: 0.039
3
Epoch 29/1000
6/6 [=====] - 0s 280us/sample - loss: 0.039
0
Epoch 30/1000
6/6 [=====] - 0s 308us/sample - loss: 0.038
7
Epoch 31/1000
6/6 [=====] - 0s 280us/sample - loss: 0.038
4
Epoch 32/1000
6/6 [=====] - 0s 385us/sample - loss: 0.038
2
Epoch 33/1000
6/6 [=====] - 0s 308us/sample - loss: 0.037
9
Epoch 34/1000
6/6 [=====] - 0s 317us/sample - loss: 0.037
6
Epoch 35/1000
6/6 [=====] - 0s 281us/sample - loss: 0.037
3
Epoch 36/1000
6/6 [=====] - 0s 333us/sample - loss: 0.037
1
Epoch 37/1000
6/6 [=====] - 0s 295us/sample - loss: 0.036
8
Epoch 38/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0365
Epoch 39/1000
6/6 [=====] - 0s 326us/sample - loss: 0.036
3
Epoch 40/1000
6/6 [=====] - 0s 404us/sample - loss: 0.036
0
Epoch 41/1000
6/6 [=====] - 0s 320us/sample - loss: 0.035
7
Epoch 42/1000
6/6 [=====] - 0s 340us/sample - loss: 0.035
5
Epoch 43/1000
```

```
6/6 [=====] - 0s 14ms/sample - loss: 0.0352
Epoch 44/1000
6/6 [=====] - 0s 290us/sample - loss: 0.035
0
Epoch 45/1000
6/6 [=====] - 0s 300us/sample - loss: 0.034
7
Epoch 46/1000
6/6 [=====] - 0s 288us/sample - loss: 0.034
4
Epoch 47/1000
6/6 [=====] - 0s 304us/sample - loss: 0.034
2
Epoch 48/1000
6/6 [=====] - 0s 332us/sample - loss: 0.033
9
Epoch 49/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0337
Epoch 50/1000
6/6 [=====] - 0s 277us/sample - loss: 0.033
5
Epoch 51/1000
6/6 [=====] - 0s 379us/sample - loss: 0.033
2
Epoch 52/1000
6/6 [=====] - 0s 303us/sample - loss: 0.033
0
Epoch 53/1000
6/6 [=====] - 0s 413us/sample - loss: 0.032
7
Epoch 54/1000
6/6 [=====] - 0s 344us/sample - loss: 0.032
5
Epoch 55/1000
6/6 [=====] - 0s 281us/sample - loss: 0.032
3
Epoch 56/1000
6/6 [=====] - 0s 267us/sample - loss: 0.032
0
Epoch 57/1000
6/6 [=====] - 0s 295us/sample - loss: 0.031
8
Epoch 58/1000
6/6 [=====] - 0s 364us/sample - loss: 0.031
6
Epoch 59/1000
6/6 [=====] - 0s 368us/sample - loss: 0.031
3
Epoch 60/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0311
Epoch 61/1000
6/6 [=====] - 0s 529us/sample - loss: 0.030
9
Epoch 62/1000
6/6 [=====] - 0s 484us/sample - loss: 0.030
6
Epoch 63/1000
6/6 [=====] - 0s 351us/sample - loss: 0.030
4
Epoch 64/1000
6/6 [=====] - 0s 347us/sample - loss: 0.030
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2
Epoch 65/1000
6/6 [=====] - 0s 566us/sample - loss: 0.030
0
Epoch 66/1000
6/6 [=====] - 0s 362us/sample - loss: 0.029
8
Epoch 67/1000
6/6 [=====] - 0s 339us/sample - loss: 0.029
5
Epoch 68/1000
6/6 [=====] - 0s 324us/sample - loss: 0.029
3
Epoch 69/1000
6/6 [=====] - 0s 301us/sample - loss: 0.029
1
Epoch 70/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0289
Epoch 71/1000
6/6 [=====] - 0s 311us/sample - loss: 0.028
7
Epoch 72/1000
6/6 [=====] - 0s 288us/sample - loss: 0.028
5
Epoch 73/1000
6/6 [=====] - 0s 324us/sample - loss: 0.028
3
Epoch 74/1000
6/6 [=====] - 0s 301us/sample - loss: 0.028
1
Epoch 75/1000
6/6 [=====] - 0s 410us/sample - loss: 0.027
9
Epoch 76/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0277
Epoch 77/1000
6/6 [=====] - 0s 391us/sample - loss: 0.027
5
Epoch 78/1000
6/6 [=====] - 0s 353us/sample - loss: 0.027
3
Epoch 79/1000
6/6 [=====] - 0s 344us/sample - loss: 0.027
1
Epoch 80/1000
6/6 [=====] - 0s 352us/sample - loss: 0.026
9
Epoch 81/1000
6/6 [=====] - 0s 325us/sample - loss: 0.026
7
Epoch 82/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0265
Epoch 83/1000
6/6 [=====] - 0s 319us/sample - loss: 0.026
3
Epoch 84/1000
6/6 [=====] - 0s 384us/sample - loss: 0.026
1
Epoch 85/1000
6/6 [=====] - 0s 316us/sample - loss: 0.025
9

Epoch 86/1000
6/6 [=====] - 0s 350us/sample - loss: 0.025
7

Epoch 87/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0255

Epoch 88/1000
6/6 [=====] - 0s 361us/sample - loss: 0.025
3

Epoch 89/1000
6/6 [=====] - 0s 324us/sample - loss: 0.025
2

Epoch 90/1000
6/6 [=====] - 0s 347us/sample - loss: 0.025
0

Epoch 91/1000
6/6 [=====] - 0s 317us/sample - loss: 0.024
8

Epoch 92/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0246

Epoch 93/1000
6/6 [=====] - 0s 318us/sample - loss: 0.024
4

Epoch 94/1000
6/6 [=====] - 0s 365us/sample - loss: 0.024
2

Epoch 95/1000
6/6 [=====] - 0s 314us/sample - loss: 0.024
1

Epoch 96/1000
6/6 [=====] - 0s 344us/sample - loss: 0.023
9

Epoch 97/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0237

Epoch 98/1000
6/6 [=====] - 0s 320us/sample - loss: 0.023
6

Epoch 99/1000
6/6 [=====] - 0s 366us/sample - loss: 0.023
4

Epoch 100/1000
6/6 [=====] - 0s 331us/sample - loss: 0.023
2

Epoch 101/1000
6/6 [=====] - 0s 388us/sample - loss: 0.023
0

Epoch 102/1000
6/6 [=====] - 0s 304us/sample - loss: 0.022
9

Epoch 103/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0227

Epoch 104/1000
6/6 [=====] - 0s 390us/sample - loss: 0.022
5

Epoch 105/1000
6/6 [=====] - 0s 374us/sample - loss: 0.022
4

Epoch 106/1000
6/6 [=====] - 0s 354us/sample - loss: 0.022
2

Epoch 107/1000
6/6 [=====] - 0s 338us/sample - loss: 0.022

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1
Epoch 108/1000
6/6 [=====] - 0s 311us/sample - loss: 0.021
9
Epoch 109/1000
6/6 [=====] - 0s 411us/sample - loss: 0.021
7
Epoch 110/1000
6/6 [=====] - 0s 333us/sample - loss: 0.021
6
Epoch 111/1000
6/6 [=====] - 0s 415us/sample - loss: 0.021
4
Epoch 112/1000
6/6 [=====] - 0s 321us/sample - loss: 0.021
3
Epoch 113/1000
6/6 [=====] - 0s 324us/sample - loss: 0.021
1
Epoch 114/1000
6/6 [=====] - 0s 436us/sample - loss: 0.021
0
Epoch 115/1000
6/6 [=====] - 0s 355us/sample - loss: 0.020
8
Epoch 116/1000
6/6 [=====] - 0s 339us/sample - loss: 0.020
6
Epoch 117/1000
6/6 [=====] - 0s 350us/sample - loss: 0.020
5
Epoch 118/1000
6/6 [=====] - 0s 387us/sample - loss: 0.020
3
Epoch 119/1000
6/6 [=====] - 0s 453us/sample - loss: 0.020
2
Epoch 120/1000
6/6 [=====] - 0s 403us/sample - loss: 0.020
1
Epoch 121/1000
6/6 [=====] - 0s 313us/sample - loss: 0.019
9
Epoch 122/1000
6/6 [=====] - 0s 363us/sample - loss: 0.019
8
Epoch 123/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0196
Epoch 124/1000
6/6 [=====] - 0s 428us/sample - loss: 0.019
5
Epoch 125/1000
6/6 [=====] - 0s 372us/sample - loss: 0.019
3
Epoch 126/1000
6/6 [=====] - 0s 403us/sample - loss: 0.019
2
Epoch 127/1000
6/6 [=====] - 0s 384us/sample - loss: 0.019
1
Epoch 128/1000
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6/6 [=====] - 0s 14ms/sample - loss: 0.0189
Epoch 129/1000
6/6 [=====] - 0s 385us/sample - loss: 0.018
8
Epoch 130/1000
6/6 [=====] - 0s 422us/sample - loss: 0.018
6
Epoch 131/1000
6/6 [=====] - 0s 360us/sample - loss: 0.018
5
Epoch 132/1000
6/6 [=====] - 0s 287us/sample - loss: 0.018
4
Epoch 133/1000
6/6 [=====] - 0s 371us/sample - loss: 0.018
2
Epoch 134/1000
6/6 [=====] - 0s 454us/sample - loss: 0.018
1
Epoch 135/1000
6/6 [=====] - 0s 396us/sample - loss: 0.018
0
Epoch 136/1000
6/6 [=====] - 0s 309us/sample - loss: 0.017
8
Epoch 137/1000
6/6 [=====] - 0s 311us/sample - loss: 0.017
7
Epoch 138/1000
6/6 [=====] - 0s 340us/sample - loss: 0.017
6
Epoch 139/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0175
Epoch 140/1000
6/6 [=====] - 0s 316us/sample - loss: 0.017
3
Epoch 141/1000
6/6 [=====] - 0s 345us/sample - loss: 0.017
2
Epoch 142/1000
6/6 [=====] - 0s 387us/sample - loss: 0.017
1
Epoch 143/1000
6/6 [=====] - 0s 392us/sample - loss: 0.016
9
Epoch 144/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0168
Epoch 145/1000
6/6 [=====] - 0s 378us/sample - loss: 0.016
7
Epoch 146/1000
6/6 [=====] - 0s 358us/sample - loss: 0.016
6
Epoch 147/1000
6/6 [=====] - 0s 329us/sample - loss: 0.016
5
Epoch 148/1000
6/6 [=====] - 0s 370us/sample - loss: 0.016
3
Epoch 149/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0162
```

```
Epoch 150/1000
6/6 [=====] - 0s 342us/sample - loss: 0.016
1
Epoch 151/1000
6/6 [=====] - 0s 333us/sample - loss: 0.016
0
Epoch 152/1000
6/6 [=====] - 0s 331us/sample - loss: 0.015
9
Epoch 153/1000
6/6 [=====] - 0s 356us/sample - loss: 0.015
8
Epoch 154/1000
6/6 [=====] - 0s 351us/sample - loss: 0.015
6
Epoch 155/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0155
Epoch 156/1000
6/6 [=====] - 0s 574us/sample - loss: 0.015
4
Epoch 157/1000
6/6 [=====] - 0s 542us/sample - loss: 0.015
3
Epoch 158/1000
6/6 [=====] - 0s 356us/sample - loss: 0.015
2
Epoch 159/1000
6/6 [=====] - 0s 334us/sample - loss: 0.015
1
Epoch 160/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0150
Epoch 161/1000
6/6 [=====] - 0s 638us/sample - loss: 0.014
9
Epoch 162/1000
6/6 [=====] - 0s 388us/sample - loss: 0.014
7
Epoch 163/1000
6/6 [=====] - 0s 433us/sample - loss: 0.014
6
Epoch 164/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0145
Epoch 165/1000
6/6 [=====] - 0s 374us/sample - loss: 0.014
4
Epoch 166/1000
6/6 [=====] - 0s 315us/sample - loss: 0.014
3
Epoch 167/1000
6/6 [=====] - 0s 412us/sample - loss: 0.014
2
Epoch 168/1000
6/6 [=====] - 0s 348us/sample - loss: 0.014
1
Epoch 169/1000
6/6 [=====] - 0s 381us/sample - loss: 0.014
0
Epoch 170/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0139
Epoch 171/1000
6/6 [=====] - 0s 407us/sample - loss: 0.013
```

8
Epoch 172/1000
6/6 [=====] - 0s 385us/sample - loss: 0.013
7
Epoch 173/1000
6/6 [=====] - 0s 375us/sample - loss: 0.013
6
Epoch 174/1000
6/6 [=====] - 0s 374us/sample - loss: 0.013
5
Epoch 175/1000
6/6 [=====] - 0s 344us/sample - loss: 0.013
4
Epoch 176/1000
6/6 [=====] - 0s 339us/sample - loss: 0.013
3
Epoch 177/1000
6/6 [=====] - 0s 345us/sample - loss: 0.013
2
Epoch 178/1000
6/6 [=====] - 0s 320us/sample - loss: 0.013
1
Epoch 179/1000
6/6 [=====] - 0s 381us/sample - loss: 0.013
0
Epoch 180/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0129
Epoch 181/1000
6/6 [=====] - 0s 306us/sample - loss: 0.012
8
Epoch 182/1000
6/6 [=====] - 0s 371us/sample - loss: 0.012
7
Epoch 183/1000
6/6 [=====] - 0s 286us/sample - loss: 0.012
6
Epoch 184/1000
6/6 [=====] - 0s 392us/sample - loss: 0.012
6
Epoch 185/1000
6/6 [=====] - 0s 283us/sample - loss: 0.012
5
Epoch 186/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0124
Epoch 187/1000
6/6 [=====] - 0s 438us/sample - loss: 0.012
3
Epoch 188/1000
6/6 [=====] - 0s 285us/sample - loss: 0.012
2
Epoch 189/1000
6/6 [=====] - 0s 324us/sample - loss: 0.012
1
Epoch 190/1000
6/6 [=====] - 0s 354us/sample - loss: 0.012
0
Epoch 191/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0119
Epoch 192/1000
6/6 [=====] - 0s 467us/sample - loss: 0.011
8

Epoch 193/1000
6/6 [=====] - 0s 399us/sample - loss: 0.011
8

Epoch 194/1000
6/6 [=====] - 0s 376us/sample - loss: 0.011
7

Epoch 195/1000
6/6 [=====] - 0s 425us/sample - loss: 0.011
6

Epoch 196/1000
6/6 [=====] - 0s 425us/sample - loss: 0.011
5

Epoch 197/1000
6/6 [=====] - 0s 369us/sample - loss: 0.011
4

Epoch 198/1000
6/6 [=====] - 0s 387us/sample - loss: 0.011
3

Epoch 199/1000
6/6 [=====] - 0s 462us/sample - loss: 0.011
3

Epoch 200/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0112

Epoch 201/1000
6/6 [=====] - 0s 472us/sample - loss: 0.011
1

Epoch 202/1000
6/6 [=====] - 0s 385us/sample - loss: 0.011
0

Epoch 203/1000
6/6 [=====] - 0s 309us/sample - loss: 0.010
9

Epoch 204/1000
6/6 [=====] - 0s 346us/sample - loss: 0.010
8

Epoch 205/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0108

Epoch 206/1000
6/6 [=====] - 0s 420us/sample - loss: 0.010
7

Epoch 207/1000
6/6 [=====] - 0s 382us/sample - loss: 0.010
6

Epoch 208/1000
6/6 [=====] - 0s 385us/sample - loss: 0.010
5

Epoch 209/1000
6/6 [=====] - 0s 384us/sample - loss: 0.010
5

Epoch 210/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0104

Epoch 211/1000
6/6 [=====] - 0s 318us/sample - loss: 0.010
3

Epoch 212/1000
6/6 [=====] - 0s 335us/sample - loss: 0.010
2

Epoch 213/1000
6/6 [=====] - 0s 364us/sample - loss: 0.010
2

Epoch 214/1000

```
6/6 [=====] - 0s 445us/sample - loss: 0.010
1
Epoch 215/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0100
Epoch 216/1000
6/6 [=====] - 0s 381us/sample - loss: 0.009
9
Epoch 217/1000
6/6 [=====] - 0s 335us/sample - loss: 0.009
9
Epoch 218/1000
6/6 [=====] - 0s 359us/sample - loss: 0.009
8
Epoch 219/1000
6/6 [=====] - 0s 342us/sample - loss: 0.009
7
Epoch 220/1000
6/6 [=====] - 0s 459us/sample - loss: 0.009
7
Epoch 221/1000
6/6 [=====] - 0s 482us/sample - loss: 0.009
6
Epoch 222/1000
6/6 [=====] - 0s 344us/sample - loss: 0.009
5
Epoch 223/1000
6/6 [=====] - 0s 344us/sample - loss: 0.009
4
Epoch 224/1000
6/6 [=====] - 0s 385us/sample - loss: 0.009
4
Epoch 225/1000
6/6 [=====] - 0s 324us/sample - loss: 0.009
3
Epoch 226/1000
6/6 [=====] - 0s 429us/sample - loss: 0.009
2
Epoch 227/1000
6/6 [=====] - 0s 383us/sample - loss: 0.009
2
Epoch 228/1000
6/6 [=====] - 0s 316us/sample - loss: 0.009
1
Epoch 229/1000
6/6 [=====] - 0s 335us/sample - loss: 0.009
0
Epoch 230/1000
6/6 [=====] - 0s 365us/sample - loss: 0.009
0
Epoch 231/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0089
Epoch 232/1000
6/6 [=====] - 0s 323us/sample - loss: 0.008
8
Epoch 233/1000
6/6 [=====] - 0s 364us/sample - loss: 0.008
8
Epoch 234/1000
6/6 [=====] - 0s 458us/sample - loss: 0.008
7
Epoch 235/1000
```

```
6/6 [=====] - 0s 425us/sample - loss: 0.008
6
Epoch 236/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0086
Epoch 237/1000
6/6 [=====] - 0s 346us/sample - loss: 0.008
5
Epoch 238/1000
6/6 [=====] - 0s 349us/sample - loss: 0.008
5
Epoch 239/1000
6/6 [=====] - 0s 394us/sample - loss: 0.008
4
Epoch 240/1000
6/6 [=====] - 0s 329us/sample - loss: 0.008
3
Epoch 241/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0083
Epoch 242/1000
6/6 [=====] - 0s 405us/sample - loss: 0.008
2
Epoch 243/1000
6/6 [=====] - 0s 412us/sample - loss: 0.008
2
Epoch 244/1000
6/6 [=====] - 0s 350us/sample - loss: 0.008
1
Epoch 245/1000
6/6 [=====] - 0s 399us/sample - loss: 0.008
0
Epoch 246/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0080
Epoch 247/1000
6/6 [=====] - 0s 426us/sample - loss: 0.007
9
Epoch 248/1000
6/6 [=====] - 0s 354us/sample - loss: 0.007
9
Epoch 249/1000
6/6 [=====] - 0s 421us/sample - loss: 0.007
8
Epoch 250/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0078
Epoch 251/1000
6/6 [=====] - 0s 371us/sample - loss: 0.007
7
Epoch 252/1000
6/6 [=====] - 0s 406us/sample - loss: 0.007
6
Epoch 253/1000
6/6 [=====] - 0s 329us/sample - loss: 0.007
6
Epoch 254/1000
6/6 [=====] - 0s 329us/sample - loss: 0.007
5
Epoch 255/1000
6/6 [=====] - 0s 376us/sample - loss: 0.007
5
Epoch 256/1000
6/6 [=====] - 0s 395us/sample - loss: 0.007
4
```

Epoch 257/1000
6/6 [=====] - 0s 330us/sample - loss: 0.007
4

Epoch 258/1000
6/6 [=====] - 0s 445us/sample - loss: 0.007
3

Epoch 259/1000
6/6 [=====] - 0s 310us/sample - loss: 0.007
3

Epoch 260/1000
6/6 [=====] - 0s 293us/sample - loss: 0.007
2

Epoch 261/1000
6/6 [=====] - 0s 412us/sample - loss: 0.007
2

Epoch 262/1000
6/6 [=====] - 0s 473us/sample - loss: 0.007
1

Epoch 263/1000
6/6 [=====] - 0s 339us/sample - loss: 0.007
0

Epoch 264/1000
6/6 [=====] - 0s 409us/sample - loss: 0.007
0

Epoch 265/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0069

Epoch 266/1000
6/6 [=====] - 0s 382us/sample - loss: 0.006
9

Epoch 267/1000
6/6 [=====] - 0s 368us/sample - loss: 0.006
8

Epoch 268/1000
6/6 [=====] - 0s 397us/sample - loss: 0.006
8

Epoch 269/1000
6/6 [=====] - 0s 324us/sample - loss: 0.006
7

Epoch 270/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0067

Epoch 271/1000
6/6 [=====] - 0s 421us/sample - loss: 0.006
6

Epoch 272/1000
6/6 [=====] - 0s 401us/sample - loss: 0.006
6

Epoch 273/1000
6/6 [=====] - 0s 425us/sample - loss: 0.006
6

Epoch 274/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0065

Epoch 275/1000
6/6 [=====] - 0s 402us/sample - loss: 0.006
5

Epoch 276/1000
6/6 [=====] - 0s 346us/sample - loss: 0.006
4

Epoch 277/1000
6/6 [=====] - 0s 355us/sample - loss: 0.006
4

Epoch 278/1000

```
6/6 [=====] - 0s 368us/sample - loss: 0.006
3
Epoch 279/1000
6/6 [=====] - 0s 347us/sample - loss: 0.006
3
Epoch 280/1000
6/6 [=====] - 0s 451us/sample - loss: 0.006
2
Epoch 281/1000
6/6 [=====] - 0s 441us/sample - loss: 0.006
2
Epoch 282/1000
6/6 [=====] - 0s 378us/sample - loss: 0.006
1
Epoch 283/1000
6/6 [=====] - 0s 387us/sample - loss: 0.006
1
Epoch 284/1000
6/6 [=====] - 0s 322us/sample - loss: 0.006
0
Epoch 285/1000
6/6 [=====] - 0s 384us/sample - loss: 0.006
0
Epoch 286/1000
6/6 [=====] - 0s 374us/sample - loss: 0.006
0
Epoch 287/1000
6/6 [=====] - 0s 382us/sample - loss: 0.005
9
Epoch 288/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0059
Epoch 289/1000
6/6 [=====] - 0s 533us/sample - loss: 0.005
8
Epoch 290/1000
6/6 [=====] - 0s 381us/sample - loss: 0.005
8
Epoch 291/1000
6/6 [=====] - 0s 395us/sample - loss: 0.005
7
Epoch 292/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0057
Epoch 293/1000
6/6 [=====] - 0s 323us/sample - loss: 0.005
7
Epoch 294/1000
6/6 [=====] - 0s 344us/sample - loss: 0.005
6
Epoch 295/1000
6/6 [=====] - 0s 461us/sample - loss: 0.005
6
Epoch 296/1000
6/6 [=====] - 0s 332us/sample - loss: 0.005
5
Epoch 297/1000
6/6 [=====] - 0s 310us/sample - loss: 0.005
5
Epoch 298/1000
6/6 [=====] - 0s 388us/sample - loss: 0.005
5
Epoch 299/1000
```



```
6/6 [=====] - 0s 374us/sample - loss: 0.005
4
Epoch 300/1000
6/6 [=====] - 0s 372us/sample - loss: 0.005
4
Epoch 301/1000
6/6 [=====] - 0s 447us/sample - loss: 0.005
3
Epoch 302/1000
6/6 [=====] - 0s 311us/sample - loss: 0.005
3
Epoch 303/1000
6/6 [=====] - 0s 334us/sample - loss: 0.005
3
Epoch 304/1000
6/6 [=====] - 0s 354us/sample - loss: 0.005
2
Epoch 305/1000
6/6 [=====] - 0s 406us/sample - loss: 0.005
2
Epoch 306/1000
6/6 [=====] - 0s 321us/sample - loss: 0.005
1
Epoch 307/1000
6/6 [=====] - 0s 311us/sample - loss: 0.005
1
Epoch 308/1000
6/6 [=====] - 0s 457us/sample - loss: 0.005
1
Epoch 309/1000
6/6 [=====] - 0s 350us/sample - loss: 0.005
0
Epoch 310/1000
6/6 [=====] - 0s 316us/sample - loss: 0.005
0
Epoch 311/1000
6/6 [=====] - 0s 339us/sample - loss: 0.005
0
Epoch 312/1000
6/6 [=====] - 0s 393us/sample - loss: 0.004
9
Epoch 313/1000
6/6 [=====] - 0s 408us/sample - loss: 0.004
9
Epoch 314/1000
6/6 [=====] - 0s 366us/sample - loss: 0.004
9
Epoch 315/1000
6/6 [=====] - 0s 335us/sample - loss: 0.004
8
Epoch 316/1000
6/6 [=====] - 0s 314us/sample - loss: 0.004
8
Epoch 317/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0047
Epoch 318/1000
6/6 [=====] - 0s 416us/sample - loss: 0.004
7
Epoch 319/1000
6/6 [=====] - 0s 398us/sample - loss: 0.004
7
```

Epoch 320/1000
6/6 [=====] - 0s 416us/sample - loss: 0.004
6
Epoch 321/1000
6/6 [=====] - 0s 355us/sample - loss: 0.004
6
Epoch 322/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0046
Epoch 323/1000
6/6 [=====] - 0s 423us/sample - loss: 0.004
5
Epoch 324/1000
6/6 [=====] - 0s 358us/sample - loss: 0.004
5
Epoch 325/1000
6/6 [=====] - 0s 381us/sample - loss: 0.004
5
Epoch 326/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0044
Epoch 327/1000
6/6 [=====] - 0s 346us/sample - loss: 0.004
4
Epoch 328/1000
6/6 [=====] - 0s 358us/sample - loss: 0.004
4
Epoch 329/1000
6/6 [=====] - 0s 352us/sample - loss: 0.004
3
Epoch 330/1000
6/6 [=====] - 0s 364us/sample - loss: 0.004
3
Epoch 331/1000
6/6 [=====] - 0s 359us/sample - loss: 0.004
3
Epoch 332/1000
6/6 [=====] - 0s 298us/sample - loss: 0.004
3
Epoch 333/1000
6/6 [=====] - 0s 321us/sample - loss: 0.004
2
Epoch 334/1000
6/6 [=====] - 0s 338us/sample - loss: 0.004
2
Epoch 335/1000
6/6 [=====] - 0s 424us/sample - loss: 0.004
2
Epoch 336/1000
6/6 [=====] - 0s 365us/sample - loss: 0.004
1
Epoch 337/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0041
Epoch 338/1000
6/6 [=====] - 0s 392us/sample - loss: 0.004
1
Epoch 339/1000
6/6 [=====] - 0s 334us/sample - loss: 0.004
0
Epoch 340/1000
6/6 [=====] - 0s 338us/sample - loss: 0.004
0
Epoch 341/1000

```
6/6 [=====] - 0s 359us/sample - loss: 0.004
0
Epoch 342/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0040
Epoch 343/1000
6/6 [=====] - 0s 402us/sample - loss: 0.003
9
Epoch 344/1000
6/6 [=====] - 0s 335us/sample - loss: 0.003
9
Epoch 345/1000
6/6 [=====] - 0s 325us/sample - loss: 0.003
9
Epoch 346/1000
6/6 [=====] - 0s 322us/sample - loss: 0.003
8
Epoch 347/1000
6/6 [=====] - 0s 370us/sample - loss: 0.003
8
Epoch 348/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0038
Epoch 349/1000
6/6 [=====] - 0s 353us/sample - loss: 0.003
8
Epoch 350/1000
6/6 [=====] - 0s 330us/sample - loss: 0.003
7
Epoch 351/1000
6/6 [=====] - 0s 422us/sample - loss: 0.003
7
Epoch 352/1000
6/6 [=====] - 0s 1ms/sample - loss: 0.0037
Epoch 353/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0036
Epoch 354/1000
6/6 [=====] - 0s 367us/sample - loss: 0.003
6
Epoch 355/1000
6/6 [=====] - 0s 372us/sample - loss: 0.003
6
Epoch 356/1000
6/6 [=====] - 0s 347us/sample - loss: 0.003
6
Epoch 357/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0035
Epoch 358/1000
6/6 [=====] - 0s 302us/sample - loss: 0.003
5
Epoch 359/1000
6/6 [=====] - 0s 278us/sample - loss: 0.003
5
Epoch 360/1000
6/6 [=====] - 0s 293us/sample - loss: 0.003
5
Epoch 361/1000
6/6 [=====] - 0s 318us/sample - loss: 0.003
4
Epoch 362/1000
6/6 [=====] - 0s 337us/sample - loss: 0.003
4
Epoch 363/1000
```

```
6/6 [=====] - 0s 305us/sample - loss: 0.003
4
Epoch 364/1000
6/6 [=====] - 0s 318us/sample - loss: 0.003
4
Epoch 365/1000
6/6 [=====] - 0s 332us/sample - loss: 0.003
3
Epoch 366/1000
6/6 [=====] - 0s 285us/sample - loss: 0.003
3
Epoch 367/1000
6/6 [=====] - 0s 338us/sample - loss: 0.003
3
Epoch 368/1000
6/6 [=====] - 0s 319us/sample - loss: 0.003
3
Epoch 369/1000
6/6 [=====] - 0s 316us/sample - loss: 0.003
2
Epoch 370/1000
6/6 [=====] - 0s 316us/sample - loss: 0.003
2
Epoch 371/1000
6/6 [=====] - 0s 334us/sample - loss: 0.003
2
Epoch 372/1000
6/6 [=====] - 0s 276us/sample - loss: 0.003
2
Epoch 373/1000
6/6 [=====] - 0s 304us/sample - loss: 0.003
2
Epoch 374/1000
6/6 [=====] - 0s 296us/sample - loss: 0.003
1
Epoch 375/1000
6/6 [=====] - 0s 396us/sample - loss: 0.003
1
Epoch 376/1000
6/6 [=====] - 0s 366us/sample - loss: 0.003
1
Epoch 377/1000
6/6 [=====] - 0s 402us/sample - loss: 0.003
1
Epoch 378/1000
6/6 [=====] - 0s 390us/sample - loss: 0.003
0
Epoch 379/1000
6/6 [=====] - 0s 315us/sample - loss: 0.003
0
Epoch 380/1000
6/6 [=====] - 0s 326us/sample - loss: 0.003
0
Epoch 381/1000
6/6 [=====] - 0s 295us/sample - loss: 0.003
0
Epoch 382/1000
6/6 [=====] - 0s 13ms/sample - loss: 0.0030
Epoch 383/1000
6/6 [=====] - 0s 300us/sample - loss: 0.002
9
```

Epoch 384/1000
6/6 [=====] - 0s 285us/sample - loss: 0.002
9

Epoch 385/1000
6/6 [=====] - 0s 387us/sample - loss: 0.002
9

Epoch 386/1000
6/6 [=====] - 0s 316us/sample - loss: 0.002
9

Epoch 387/1000
6/6 [=====] - 0s 317us/sample - loss: 0.002
8

Epoch 388/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0028

Epoch 389/1000
6/6 [=====] - 0s 342us/sample - loss: 0.002
8

Epoch 390/1000
6/6 [=====] - 0s 349us/sample - loss: 0.002
8

Epoch 391/1000
6/6 [=====] - 0s 329us/sample - loss: 0.002
8

Epoch 392/1000
6/6 [=====] - 0s 292us/sample - loss: 0.002
7

Epoch 393/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0027

Epoch 394/1000
6/6 [=====] - 0s 422us/sample - loss: 0.002
7

Epoch 395/1000
6/6 [=====] - 0s 383us/sample - loss: 0.002
7

Epoch 396/1000
6/6 [=====] - 0s 332us/sample - loss: 0.002
7

Epoch 397/1000
6/6 [=====] - 0s 327us/sample - loss: 0.002
6

Epoch 398/1000
6/6 [=====] - 0s 417us/sample - loss: 0.002
6

Epoch 399/1000
6/6 [=====] - 0s 318us/sample - loss: 0.002
6

Epoch 400/1000
6/6 [=====] - 0s 402us/sample - loss: 0.002
6

Epoch 401/1000
6/6 [=====] - 0s 404us/sample - loss: 0.002
6

Epoch 402/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0026

Epoch 403/1000
6/6 [=====] - 0s 390us/sample - loss: 0.002
5

Epoch 404/1000
6/6 [=====] - 0s 310us/sample - loss: 0.002
5

Epoch 405/1000

```
6/6 [=====] - 0s 300us/sample - loss: 0.002
5
Epoch 406/1000
6/6 [=====] - 0s 311us/sample - loss: 0.002
5
Epoch 407/1000
6/6 [=====] - 0s 331us/sample - loss: 0.002
5
Epoch 408/1000
6/6 [=====] - 0s 415us/sample - loss: 0.002
4
Epoch 409/1000
6/6 [=====] - 0s 310us/sample - loss: 0.002
4
Epoch 410/1000
6/6 [=====] - 0s 334us/sample - loss: 0.002
4
Epoch 411/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0024
Epoch 412/1000
6/6 [=====] - 0s 409us/sample - loss: 0.002
4
Epoch 413/1000
6/6 [=====] - 0s 365us/sample - loss: 0.002
4
Epoch 414/1000
6/6 [=====] - 0s 418us/sample - loss: 0.002
3
Epoch 415/1000
6/6 [=====] - 0s 367us/sample - loss: 0.002
3
Epoch 416/1000
6/6 [=====] - 0s 330us/sample - loss: 0.002
3
Epoch 417/1000
6/6 [=====] - 0s 302us/sample - loss: 0.002
3
Epoch 418/1000
6/6 [=====] - 0s 282us/sample - loss: 0.002
3
Epoch 419/1000
6/6 [=====] - 0s 292us/sample - loss: 0.002
3
Epoch 420/1000
6/6 [=====] - 0s 400us/sample - loss: 0.002
2
Epoch 421/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0022
Epoch 422/1000
6/6 [=====] - 0s 366us/sample - loss: 0.002
2
Epoch 423/1000
6/6 [=====] - 0s 400us/sample - loss: 0.002
2
Epoch 424/1000
6/6 [=====] - 0s 319us/sample - loss: 0.002
2
Epoch 425/1000
6/6 [=====] - 0s 363us/sample - loss: 0.002
2
Epoch 426/1000
```

```
6/6 [=====] - 0s 14ms/sample - loss: 0.0021
Epoch 427/1000
6/6 [=====] - 0s 323us/sample - loss: 0.002
1
Epoch 428/1000
6/6 [=====] - 0s 315us/sample - loss: 0.002
1
Epoch 429/1000
6/6 [=====] - 0s 310us/sample - loss: 0.002
1
Epoch 430/1000
6/6 [=====] - 0s 308us/sample - loss: 0.002
1
Epoch 431/1000
6/6 [=====] - 0s 398us/sample - loss: 0.002
1
Epoch 432/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0020
Epoch 433/1000
6/6 [=====] - 0s 328us/sample - loss: 0.002
0
Epoch 434/1000
6/6 [=====] - 0s 360us/sample - loss: 0.002
0
Epoch 435/1000
6/6 [=====] - 0s 423us/sample - loss: 0.002
0
Epoch 436/1000
6/6 [=====] - 0s 298us/sample - loss: 0.002
0
Epoch 437/1000
6/6 [=====] - 0s 292us/sample - loss: 0.002
0
Epoch 438/1000
6/6 [=====] - 0s 410us/sample - loss: 0.002
0
Epoch 439/1000
6/6 [=====] - 0s 359us/sample - loss: 0.001
9
Epoch 440/1000
6/6 [=====] - 0s 316us/sample - loss: 0.001
9
Epoch 441/1000
6/6 [=====] - 0s 391us/sample - loss: 0.001
9
Epoch 442/1000
6/6 [=====] - 0s 294us/sample - loss: 0.001
9
Epoch 443/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0019
Epoch 444/1000
6/6 [=====] - 0s 313us/sample - loss: 0.001
9
Epoch 445/1000
6/6 [=====] - 0s 314us/sample - loss: 0.001
9
Epoch 446/1000
6/6 [=====] - 0s 316us/sample - loss: 0.001
8
Epoch 447/1000
6/6 [=====] - 0s 323us/sample - loss: 0.001
```

```
8
Epoch 448/1000
6/6 [=====] - 0s 316us/sample - loss: 0.001
8
Epoch 449/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0018
Epoch 450/1000
6/6 [=====] - 0s 377us/sample - loss: 0.001
8
Epoch 451/1000
6/6 [=====] - 0s 300us/sample - loss: 0.001
8
Epoch 452/1000
6/6 [=====] - 0s 343us/sample - loss: 0.001
8
Epoch 453/1000
6/6 [=====] - 0s 356us/sample - loss: 0.001
8
Epoch 454/1000
6/6 [=====] - 0s 365us/sample - loss: 0.001
7
Epoch 455/1000
6/6 [=====] - 0s 438us/sample - loss: 0.001
7
Epoch 456/1000
6/6 [=====] - 0s 288us/sample - loss: 0.001
7
Epoch 457/1000
6/6 [=====] - 0s 357us/sample - loss: 0.001
7
Epoch 458/1000
6/6 [=====] - 0s 303us/sample - loss: 0.001
7
Epoch 459/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0017
Epoch 460/1000
6/6 [=====] - 0s 371us/sample - loss: 0.001
7
Epoch 461/1000
6/6 [=====] - 0s 308us/sample - loss: 0.001
7
Epoch 462/1000
6/6 [=====] - 0s 307us/sample - loss: 0.001
6
Epoch 463/1000
6/6 [=====] - 0s 305us/sample - loss: 0.001
6
Epoch 464/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0016
Epoch 465/1000
6/6 [=====] - 0s 311us/sample - loss: 0.001
6
Epoch 466/1000
6/6 [=====] - 0s 373us/sample - loss: 0.001
6
Epoch 467/1000
6/6 [=====] - 0s 302us/sample - loss: 0.001
6
Epoch 468/1000
6/6 [=====] - 0s 397us/sample - loss: 0.001
6
```


Epoch 469/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0016
Epoch 470/1000
6/6 [=====] - 0s 301us/sample - loss: 0.001
6
Epoch 471/1000
6/6 [=====] - 0s 397us/sample - loss: 0.001
5
Epoch 472/1000
6/6 [=====] - 0s 282us/sample - loss: 0.001
5
Epoch 473/1000
6/6 [=====] - 0s 291us/sample - loss: 0.001
5
Epoch 474/1000
6/6 [=====] - 0s 354us/sample - loss: 0.001
5
Epoch 475/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0015
Epoch 476/1000
6/6 [=====] - 0s 294us/sample - loss: 0.001
5
Epoch 477/1000
6/6 [=====] - 0s 265us/sample - loss: 0.001
5
Epoch 478/1000
6/6 [=====] - 0s 283us/sample - loss: 0.001
5
Epoch 479/1000
6/6 [=====] - 0s 324us/sample - loss: 0.001
5
Epoch 480/1000
6/6 [=====] - 0s 300us/sample - loss: 0.001
4
Epoch 481/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0014
Epoch 482/1000
6/6 [=====] - 0s 385us/sample - loss: 0.001
4
Epoch 483/1000
6/6 [=====] - 0s 312us/sample - loss: 0.001
4
Epoch 484/1000
6/6 [=====] - 0s 304us/sample - loss: 0.001
4
Epoch 485/1000
6/6 [=====] - 0s 377us/sample - loss: 0.001
4
Epoch 486/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0014
Epoch 487/1000
6/6 [=====] - 0s 293us/sample - loss: 0.001
4
Epoch 488/1000
6/6 [=====] - 0s 338us/sample - loss: 0.001
4
Epoch 489/1000
6/6 [=====] - 0s 304us/sample - loss: 0.001
3
Epoch 490/1000
6/6 [=====] - 0s 393us/sample - loss: 0.001

```
3
Epoch 491/1000
6/6 [=====] - 0s 15ms/sample - loss: 0.0013
Epoch 492/1000
6/6 [=====] - 0s 354us/sample - loss: 0.001
3
Epoch 493/1000
6/6 [=====] - 0s 337us/sample - loss: 0.001
3
Epoch 494/1000
6/6 [=====] - 0s 341us/sample - loss: 0.001
3
Epoch 495/1000
6/6 [=====] - 0s 345us/sample - loss: 0.001
3
Epoch 496/1000
6/6 [=====] - 0s 354us/sample - loss: 0.001
3
Epoch 497/1000
6/6 [=====] - 0s 325us/sample - loss: 0.001
3
Epoch 498/1000
6/6 [=====] - 0s 373us/sample - loss: 0.001
3
Epoch 499/1000
6/6 [=====] - 0s 440us/sample - loss: 0.001
3
Epoch 500/1000
6/6 [=====] - 0s 304us/sample - loss: 0.001
2
Epoch 501/1000
6/6 [=====] - 0s 327us/sample - loss: 0.001
2
Epoch 502/1000
6/6 [=====] - 0s 320us/sample - loss: 0.001
2
Epoch 503/1000
6/6 [=====] - 0s 321us/sample - loss: 0.001
2
Epoch 504/1000
6/6 [=====] - 0s 323us/sample - loss: 0.001
2
Epoch 505/1000
6/6 [=====] - 0s 340us/sample - loss: 0.001
2
Epoch 506/1000
6/6 [=====] - 0s 389us/sample - loss: 0.001
2
Epoch 507/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0012
Epoch 508/1000
6/6 [=====] - 0s 349us/sample - loss: 0.001
2
Epoch 509/1000
6/6 [=====] - 0s 318us/sample - loss: 0.001
2
Epoch 510/1000
6/6 [=====] - 0s 339us/sample - loss: 0.001
2
Epoch 511/1000
6/6 [=====] - 0s 406us/sample - loss: 0.001
```

```
1
Epoch 512/1000
6/6 [=====] - 0s 279us/sample - loss: 0.001
1
Epoch 513/1000
6/6 [=====] - 0s 278us/sample - loss: 0.001
1
Epoch 514/1000
6/6 [=====] - 0s 347us/sample - loss: 0.001
1
Epoch 515/1000
6/6 [=====] - 0s 379us/sample - loss: 0.001
1
Epoch 516/1000
6/6 [=====] - 0s 336us/sample - loss: 0.001
1
Epoch 517/1000
6/6 [=====] - 0s 345us/sample - loss: 0.001
1
Epoch 518/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0011
Epoch 519/1000
6/6 [=====] - 0s 318us/sample - loss: 0.001
1
Epoch 520/1000
6/6 [=====] - 0s 315us/sample - loss: 0.001
1
Epoch 521/1000
6/6 [=====] - 0s 327us/sample - loss: 0.001
1
Epoch 522/1000
6/6 [=====] - 0s 489us/sample - loss: 0.001
1
Epoch 523/1000
6/6 [=====] - 0s 14ms/sample - loss: 0.0011
Epoch 524/1000
6/6 [=====] - 0s 299us/sample - loss: 0.001
0
Epoch 525/1000
6/6 [=====] - 0s 356us/sample - loss: 0.001
0
Epoch 526/1000
6/6 [=====] - 0s 350us/sample - loss: 0.001
0
Epoch 527/1000
6/6 [=====] - 0s 336us/sample - loss: 0.001
0
Epoch 528/1000
6/6 [=====] - 0s 360us/sample - loss: 0.001
0
Epoch 529/1000
6/6 [=====] - 0s 312us/sample - loss: 0.001
0
Epoch 530/1000
6/6 [=====] - 0s 350us/sample - loss: 0.001
0
Epoch 531/1000
6/6 [=====] - 0s 356us/sample - loss: 9.929
9e-04
Epoch 532/1000
6/6 [=====] - 0s 335us/sample - loss: 9.857
```

5e-04
Epoch 533/1000
6/6 [=====] - 0s 306us/sample - loss: 9.785
7e-04
Epoch 534/1000
6/6 [=====] - 0s 14ms/sample - loss: 9.7144
e-04
Epoch 535/1000
6/6 [=====] - 0s 395us/sample - loss: 9.643
6e-04
Epoch 536/1000
6/6 [=====] - 0s 327us/sample - loss: 9.573
3e-04
Epoch 537/1000
6/6 [=====] - 0s 475us/sample - loss: 9.503
6e-04
Epoch 538/1000
6/6 [=====] - 0s 313us/sample - loss: 9.434
4e-04
Epoch 539/1000
6/6 [=====] - 0s 301us/sample - loss: 9.365
6e-04
Epoch 540/1000
6/6 [=====] - 0s 14ms/sample - loss: 9.2974
e-04
Epoch 541/1000
6/6 [=====] - 0s 377us/sample - loss: 9.229
7e-04
Epoch 542/1000
6/6 [=====] - 0s 359us/sample - loss: 9.162
4e-04
Epoch 543/1000
6/6 [=====] - 0s 413us/sample - loss: 9.095
7e-04
Epoch 544/1000
6/6 [=====] - 0s 333us/sample - loss: 9.029
4e-04
Epoch 545/1000
6/6 [=====] - 0s 14ms/sample - loss: 8.9636
e-04
Epoch 546/1000
6/6 [=====] - 0s 336us/sample - loss: 8.898
3e-04
Epoch 547/1000
6/6 [=====] - 0s 355us/sample - loss: 8.833
5e-04
Epoch 548/1000
6/6 [=====] - 0s 341us/sample - loss: 8.769
1e-04
Epoch 549/1000
6/6 [=====] - 0s 330us/sample - loss: 8.705
2e-04
Epoch 550/1000
6/6 [=====] - 0s 314us/sample - loss: 8.641
8e-04
Epoch 551/1000
6/6 [=====] - 0s 429us/sample - loss: 8.578
8e-04
Epoch 552/1000
6/6 [=====] - 0s 431us/sample - loss: 8.516
3e-04

Epoch 553/1000
6/6 [=====] - 0s 289us/sample - loss: 8.454
3e-04

Epoch 554/1000
6/6 [=====] - 0s 340us/sample - loss: 8.392
7e-04

Epoch 555/1000
6/6 [=====] - 0s 370us/sample - loss: 8.331
5e-04

Epoch 556/1000
6/6 [=====] - 0s 14ms/sample - loss: 8.2709
e-04

Epoch 557/1000
6/6 [=====] - 0s 337us/sample - loss: 8.210
6e-04

Epoch 558/1000
6/6 [=====] - 0s 369us/sample - loss: 8.150
8e-04

Epoch 559/1000
6/6 [=====] - 0s 360us/sample - loss: 8.091
4e-04

Epoch 560/1000
6/6 [=====] - 0s 371us/sample - loss: 8.032
5e-04

Epoch 561/1000
6/6 [=====] - 0s 14ms/sample - loss: 7.9739
e-04

Epoch 562/1000
6/6 [=====] - 0s 396us/sample - loss: 7.915
8e-04

Epoch 563/1000
6/6 [=====] - 0s 323us/sample - loss: 7.858
1e-04

Epoch 564/1000
6/6 [=====] - 0s 334us/sample - loss: 7.800
9e-04

Epoch 565/1000
6/6 [=====] - 0s 365us/sample - loss: 7.744
1e-04

Epoch 566/1000
6/6 [=====] - 0s 14ms/sample - loss: 7.6877
e-04

Epoch 567/1000
6/6 [=====] - 0s 314us/sample - loss: 7.631
6e-04

Epoch 568/1000
6/6 [=====] - 0s 343us/sample - loss: 7.576
0e-04

Epoch 569/1000
6/6 [=====] - 0s 353us/sample - loss: 7.520
8e-04

Epoch 570/1000
6/6 [=====] - 0s 349us/sample - loss: 7.466
1e-04

Epoch 571/1000
6/6 [=====] - 0s 437us/sample - loss: 7.411
7e-04

Epoch 572/1000
6/6 [=====] - 0s 408us/sample - loss: 7.357
7e-04

Epoch 573/1000

```
6/6 [=====] - 0s 387us/sample - loss: 7.304
0e-04
Epoch 574/1000
6/6 [=====] - 0s 369us/sample - loss: 7.250
9e-04
Epoch 575/1000
6/6 [=====] - 0s 404us/sample - loss: 7.198
0e-04
Epoch 576/1000
6/6 [=====] - 0s 375us/sample - loss: 7.145
6e-04
Epoch 577/1000
6/6 [=====] - 0s 369us/sample - loss: 7.093
5e-04
Epoch 578/1000
6/6 [=====] - 0s 316us/sample - loss: 7.041
8e-04
Epoch 579/1000
6/6 [=====] - 0s 341us/sample - loss: 6.990
5e-04
Epoch 580/1000
6/6 [=====] - 0s 337us/sample - loss: 6.939
6e-04
Epoch 581/1000
6/6 [=====] - 0s 341us/sample - loss: 6.889
0e-04
Epoch 582/1000
6/6 [=====] - 0s 356us/sample - loss: 6.838
9e-04
Epoch 583/1000
6/6 [=====] - 0s 305us/sample - loss: 6.789
0e-04
Epoch 584/1000
6/6 [=====] - 0s 353us/sample - loss: 6.739
6e-04
Epoch 585/1000
6/6 [=====] - 0s 342us/sample - loss: 6.690
5e-04
Epoch 586/1000
6/6 [=====] - 0s 342us/sample - loss: 6.641
7e-04
Epoch 587/1000
6/6 [=====] - 0s 14ms/sample - loss: 6.5933
e-04
Epoch 588/1000
6/6 [=====] - 0s 351us/sample - loss: 6.545
3e-04
Epoch 589/1000
6/6 [=====] - 0s 299us/sample - loss: 6.497
6e-04
Epoch 590/1000
6/6 [=====] - 0s 306us/sample - loss: 6.450
3e-04
Epoch 591/1000
6/6 [=====] - 0s 308us/sample - loss: 6.403
3e-04
Epoch 592/1000
6/6 [=====] - 0s 337us/sample - loss: 6.356
6e-04
Epoch 593/1000
6/6 [=====] - 0s 14ms/sample - loss: 6.3103
```

e-04
Epoch 594/1000
6/6 [=====] - 0s 344us/sample - loss: 6.264
3e-04
Epoch 595/1000
6/6 [=====] - 0s 371us/sample - loss: 6.218
7e-04
Epoch 596/1000
6/6 [=====] - 0s 376us/sample - loss: 6.173
4e-04
Epoch 597/1000
6/6 [=====] - 0s 375us/sample - loss: 6.128
4e-04
Epoch 598/1000
6/6 [=====] - 0s 381us/sample - loss: 6.083
8e-04
Epoch 599/1000
6/6 [=====] - 0s 295us/sample - loss: 6.039
5e-04
Epoch 600/1000
6/6 [=====] - 0s 368us/sample - loss: 5.995
5e-04
Epoch 601/1000
6/6 [=====] - 0s 287us/sample - loss: 5.951
8e-04
Epoch 602/1000
6/6 [=====] - 0s 327us/sample - loss: 5.908
4e-04
Epoch 603/1000
6/6 [=====] - 0s 308us/sample - loss: 5.865
4e-04
Epoch 604/1000
6/6 [=====] - 0s 330us/sample - loss: 5.822
6e-04
Epoch 605/1000
6/6 [=====] - 0s 14ms/sample - loss: 5.7802
e-04
Epoch 606/1000
6/6 [=====] - 0s 339us/sample - loss: 5.738
1e-04
Epoch 607/1000
6/6 [=====] - 0s 369us/sample - loss: 5.696
3e-04
Epoch 608/1000
6/6 [=====] - 0s 328us/sample - loss: 5.654
8e-04
Epoch 609/1000
6/6 [=====] - 0s 402us/sample - loss: 5.613
6e-04
Epoch 610/1000
6/6 [=====] - 0s 300us/sample - loss: 5.572
7e-04
Epoch 611/1000
6/6 [=====] - 0s 342us/sample - loss: 5.532
1e-04
Epoch 612/1000
6/6 [=====] - 0s 321us/sample - loss: 5.491
8e-04
Epoch 613/1000
6/6 [=====] - 0s 368us/sample - loss: 5.451
8e-04

Epoch 614/1000
6/6 [=====] - 0s 367us/sample - loss: 5.412
1e-04

Epoch 615/1000
6/6 [=====] - 0s 344us/sample - loss: 5.372
6e-04

Epoch 616/1000
6/6 [=====] - 0s 315us/sample - loss: 5.333
5e-04

Epoch 617/1000
6/6 [=====] - 0s 319us/sample - loss: 5.294
6e-04

Epoch 618/1000
6/6 [=====] - 0s 304us/sample - loss: 5.256
1e-04

Epoch 619/1000
6/6 [=====] - 0s 279us/sample - loss: 5.217
8e-04

Epoch 620/1000
6/6 [=====] - 0s 271us/sample - loss: 5.179
8e-04

Epoch 621/1000
6/6 [=====] - 0s 303us/sample - loss: 5.142
0e-04

Epoch 622/1000
6/6 [=====] - 0s 295us/sample - loss: 5.104
6e-04

Epoch 623/1000
6/6 [=====] - 0s 287us/sample - loss: 5.067
4e-04

Epoch 624/1000
6/6 [=====] - 0s 354us/sample - loss: 5.030
5e-04

Epoch 625/1000
6/6 [=====] - 0s 335us/sample - loss: 4.993
8e-04

Epoch 626/1000
6/6 [=====] - 0s 14ms/sample - loss: 4.9574
e-04

Epoch 627/1000
6/6 [=====] - 0s 330us/sample - loss: 4.921
3e-04

Epoch 628/1000
6/6 [=====] - 0s 335us/sample - loss: 4.885
5e-04

Epoch 629/1000
6/6 [=====] - 0s 366us/sample - loss: 4.849
8e-04

Epoch 630/1000
6/6 [=====] - 0s 295us/sample - loss: 4.814
5e-04

Epoch 631/1000
6/6 [=====] - 0s 290us/sample - loss: 4.779
4e-04

Epoch 632/1000
6/6 [=====] - 0s 338us/sample - loss: 4.744
6e-04

Epoch 633/1000
6/6 [=====] - 0s 312us/sample - loss: 4.710
0e-04

Epoch 634/1000


```
6/6 [=====] - 0s 282us/sample - loss: 4.675
7e-04
Epoch 635/1000
6/6 [=====] - 0s 321us/sample - loss: 4.641
7e-04
Epoch 636/1000
6/6 [=====] - 0s 297us/sample - loss: 4.607
9e-04
Epoch 637/1000
6/6 [=====] - 0s 14ms/sample - loss: 4.5743
e-04
Epoch 638/1000
6/6 [=====] - 0s 318us/sample - loss: 4.541
0e-04
Epoch 639/1000
6/6 [=====] - 0s 344us/sample - loss: 4.507
9e-04
Epoch 640/1000
6/6 [=====] - 0s 320us/sample - loss: 4.475
0e-04
Epoch 641/1000
6/6 [=====] - 0s 345us/sample - loss: 4.442
4e-04
Epoch 642/1000
6/6 [=====] - 0s 14ms/sample - loss: 4.4101
e-04
Epoch 643/1000
6/6 [=====] - 0s 385us/sample - loss: 4.377
9e-04
Epoch 644/1000
6/6 [=====] - 0s 330us/sample - loss: 4.346
0e-04
Epoch 645/1000
6/6 [=====] - 0s 406us/sample - loss: 4.314
4e-04
Epoch 646/1000
6/6 [=====] - 0s 337us/sample - loss: 4.282
9e-04
Epoch 647/1000
6/6 [=====] - 0s 404us/sample - loss: 4.251
7e-04
Epoch 648/1000
6/6 [=====] - 0s 355us/sample - loss: 4.220
8e-04
Epoch 649/1000
6/6 [=====] - 0s 358us/sample - loss: 4.190
0e-04
Epoch 650/1000
6/6 [=====] - 0s 388us/sample - loss: 4.159
5e-04
Epoch 651/1000
6/6 [=====] - 0s 332us/sample - loss: 4.129
2e-04
Epoch 652/1000
6/6 [=====] - 0s 14ms/sample - loss: 4.0991
e-04
Epoch 653/1000
6/6 [=====] - 0s 384us/sample - loss: 4.069
2e-04
Epoch 654/1000
6/6 [=====] - 0s 385us/sample - loss: 4.039
```

6e-04
Epoch 655/1000
6/6 [=====] - 0s 309us/sample - loss: 4.010
2e-04
Epoch 656/1000
6/6 [=====] - 0s 351us/sample - loss: 3.980
9e-04
Epoch 657/1000
6/6 [=====] - 0s 314us/sample - loss: 3.951
9e-04
Epoch 658/1000
6/6 [=====] - 0s 406us/sample - loss: 3.923
2e-04
Epoch 659/1000
6/6 [=====] - 0s 272us/sample - loss: 3.894
6e-04
Epoch 660/1000
6/6 [=====] - 0s 308us/sample - loss: 3.866
2e-04
Epoch 661/1000
6/6 [=====] - 0s 391us/sample - loss: 3.838
0e-04
Epoch 662/1000
6/6 [=====] - 0s 362us/sample - loss: 3.810
0e-04
Epoch 663/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.7823
e-04
Epoch 664/1000
6/6 [=====] - 0s 378us/sample - loss: 3.754
7e-04
Epoch 665/1000
6/6 [=====] - 0s 365us/sample - loss: 3.727
4e-04
Epoch 666/1000
6/6 [=====] - 0s 328us/sample - loss: 3.700
2e-04
Epoch 667/1000
6/6 [=====] - 0s 367us/sample - loss: 3.673
3e-04
Epoch 668/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.6465
e-04
Epoch 669/1000
6/6 [=====] - 0s 452us/sample - loss: 3.619
9e-04
Epoch 670/1000
6/6 [=====] - 0s 303us/sample - loss: 3.593
6e-04
Epoch 671/1000
6/6 [=====] - 0s 318us/sample - loss: 3.567
4e-04
Epoch 672/1000
6/6 [=====] - 0s 352us/sample - loss: 3.541
4e-04
Epoch 673/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.5156
e-04
Epoch 674/1000
6/6 [=====] - 0s 349us/sample - loss: 3.490
0e-04

Epoch 675/1000
6/6 [=====] - 0s 366us/sample - loss: 3.464
5e-04

Epoch 676/1000
6/6 [=====] - 0s 383us/sample - loss: 3.439
3e-04

Epoch 677/1000
6/6 [=====] - 0s 377us/sample - loss: 3.414
3e-04

Epoch 678/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.3894
e-04

Epoch 679/1000
6/6 [=====] - 0s 408us/sample - loss: 3.364
7e-04

Epoch 680/1000
6/6 [=====] - 0s 340us/sample - loss: 3.340
2e-04

Epoch 681/1000
6/6 [=====] - 0s 398us/sample - loss: 3.315
8e-04

Epoch 682/1000
6/6 [=====] - 0s 331us/sample - loss: 3.291
7e-04

Epoch 683/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.2677
e-04

Epoch 684/1000
6/6 [=====] - 0s 438us/sample - loss: 3.243
9e-04

Epoch 685/1000
6/6 [=====] - 0s 310us/sample - loss: 3.220
3e-04

Epoch 686/1000
6/6 [=====] - 0s 357us/sample - loss: 3.196
8e-04

Epoch 687/1000
6/6 [=====] - 0s 368us/sample - loss: 3.173
5e-04

Epoch 688/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.1504
e-04

Epoch 689/1000
6/6 [=====] - 0s 371us/sample - loss: 3.127
5e-04

Epoch 690/1000
6/6 [=====] - 0s 293us/sample - loss: 3.104
7e-04

Epoch 691/1000
6/6 [=====] - 0s 283us/sample - loss: 3.082
0e-04

Epoch 692/1000
6/6 [=====] - 0s 336us/sample - loss: 3.059
6e-04

Epoch 693/1000
6/6 [=====] - 0s 274us/sample - loss: 3.037
3e-04

Epoch 694/1000
6/6 [=====] - 0s 14ms/sample - loss: 3.0152
e-04

Epoch 695/1000

```
6/6 [=====] - 0s 361us/sample - loss: 2.993
2e-04
Epoch 696/1000
6/6 [=====] - 0s 324us/sample - loss: 2.971
4e-04
Epoch 697/1000
6/6 [=====] - 0s 342us/sample - loss: 2.949
7e-04
Epoch 698/1000
6/6 [=====] - 0s 297us/sample - loss: 2.928
3e-04
Epoch 699/1000
6/6 [=====] - 0s 291us/sample - loss: 2.906
9e-04
Epoch 700/1000
6/6 [=====] - 0s 429us/sample - loss: 2.885
8e-04
Epoch 701/1000
6/6 [=====] - 0s 443us/sample - loss: 2.864
7e-04
Epoch 702/1000
6/6 [=====] - 0s 339us/sample - loss: 2.843
9e-04
Epoch 703/1000
6/6 [=====] - 0s 427us/sample - loss: 2.823
1e-04
Epoch 704/1000
6/6 [=====] - 0s 14ms/sample - loss: 2.8026
e-04
Epoch 705/1000
6/6 [=====] - 0s 349us/sample - loss: 2.782
1e-04
Epoch 706/1000
6/6 [=====] - 0s 320us/sample - loss: 2.761
9e-04
Epoch 707/1000
6/6 [=====] - 0s 354us/sample - loss: 2.741
7e-04
Epoch 708/1000
6/6 [=====] - 0s 300us/sample - loss: 2.721
8e-04
Epoch 709/1000
6/6 [=====] - 0s 323us/sample - loss: 2.701
9e-04
Epoch 710/1000
6/6 [=====] - 0s 14ms/sample - loss: 2.6822
e-04
Epoch 711/1000
6/6 [=====] - 0s 289us/sample - loss: 2.662
7e-04
Epoch 712/1000
6/6 [=====] - 0s 350us/sample - loss: 2.643
3e-04
Epoch 713/1000
6/6 [=====] - 0s 328us/sample - loss: 2.624
1e-04
Epoch 714/1000
6/6 [=====] - 0s 326us/sample - loss: 2.604
9e-04
Epoch 715/1000
6/6 [=====] - 0s 14ms/sample - loss: 2.5860
```

e-04
Epoch 716/1000
6/6 [=====] - 0s 343us/sample - loss: 2.567
1e-04
Epoch 717/1000
6/6 [=====] - 0s 308us/sample - loss: 2.548
4e-04
Epoch 718/1000
6/6 [=====] - 0s 322us/sample - loss: 2.529
8e-04
Epoch 719/1000
6/6 [=====] - 0s 295us/sample - loss: 2.511
4e-04
Epoch 720/1000
6/6 [=====] - 0s 14ms/sample - loss: 2.4931
e-04
Epoch 721/1000
6/6 [=====] - 0s 336us/sample - loss: 2.475
0e-04
Epoch 722/1000
6/6 [=====] - 0s 345us/sample - loss: 2.456
9e-04
Epoch 723/1000
6/6 [=====] - 0s 286us/sample - loss: 2.439
0e-04
Epoch 724/1000
6/6 [=====] - 0s 340us/sample - loss: 2.421
2e-04
Epoch 725/1000
6/6 [=====] - 0s 14ms/sample - loss: 2.4036
e-04
Epoch 726/1000
6/6 [=====] - 0s 313us/sample - loss: 2.386
1e-04
Epoch 727/1000
6/6 [=====] - 0s 291us/sample - loss: 2.368
7e-04
Epoch 728/1000
6/6 [=====] - 0s 346us/sample - loss: 2.351
4e-04
Epoch 729/1000
6/6 [=====] - 0s 272us/sample - loss: 2.334
3e-04
Epoch 730/1000
6/6 [=====] - 0s 290us/sample - loss: 2.317
3e-04
Epoch 731/1000
6/6 [=====] - 0s 371us/sample - loss: 2.300
4e-04
Epoch 732/1000
6/6 [=====] - 0s 285us/sample - loss: 2.283
7e-04
Epoch 733/1000
6/6 [=====] - 0s 286us/sample - loss: 2.267
0e-04
Epoch 734/1000
6/6 [=====] - 0s 314us/sample - loss: 2.250
5e-04
Epoch 735/1000
6/6 [=====] - 0s 15ms/sample - loss: 2.2341
e-04

Epoch 736/1000
6/6 [=====] - 0s 385us/sample - loss: 2.2178e-04
Epoch 737/1000
6/6 [=====] - 0s 337us/sample - loss: 2.2017e-04
Epoch 738/1000
6/6 [=====] - 0s 325us/sample - loss: 2.1857e-04
Epoch 739/1000
6/6 [=====] - 0s 289us/sample - loss: 2.1697e-04
Epoch 740/1000
6/6 [=====] - 0s 353us/sample - loss: 2.1539e-04
Epoch 741/1000
6/6 [=====] - 0s 327us/sample - loss: 2.1382e-04
Epoch 742/1000
6/6 [=====] - 0s 345us/sample - loss: 2.1226e-04
Epoch 743/1000
6/6 [=====] - 0s 357us/sample - loss: 2.1072e-04
Epoch 744/1000
6/6 [=====] - 0s 14ms/sample - loss: 2.0918e-04
Epoch 745/1000
6/6 [=====] - 0s 399us/sample - loss: 2.0766e-04
Epoch 746/1000
6/6 [=====] - 0s 300us/sample - loss: 2.0615e-04
Epoch 747/1000
6/6 [=====] - 0s 378us/sample - loss: 2.0464e-04
Epoch 748/1000
6/6 [=====] - 0s 15ms/sample - loss: 2.0315e-04
Epoch 749/1000
6/6 [=====] - 0s 344us/sample - loss: 2.0167e-04
Epoch 750/1000
6/6 [=====] - 0s 305us/sample - loss: 2.0020e-04
Epoch 751/1000
6/6 [=====] - 0s 396us/sample - loss: 1.9875e-04
Epoch 752/1000
6/6 [=====] - 0s 311us/sample - loss: 1.9730e-04
Epoch 753/1000
6/6 [=====] - 0s 375us/sample - loss: 1.9586e-04
Epoch 754/1000
6/6 [=====] - 0s 340us/sample - loss: 1.9443e-04
Epoch 755/1000
6/6 [=====] - 0s 353us/sample - loss: 1.9302e-04
Epoch 756/1000

```
6/6 [=====] - 0s 394us/sample - loss: 1.916
1e-04
Epoch 757/1000
6/6 [=====] - 0s 306us/sample - loss: 1.902
1e-04
Epoch 758/1000
6/6 [=====] - 0s 337us/sample - loss: 1.888
3e-04
Epoch 759/1000
6/6 [=====] - 0s 361us/sample - loss: 1.874
5e-04
Epoch 760/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.8609
e-04
Epoch 761/1000
6/6 [=====] - 0s 355us/sample - loss: 1.847
3e-04
Epoch 762/1000
6/6 [=====] - 0s 304us/sample - loss: 1.833
9e-04
Epoch 763/1000
6/6 [=====] - 0s 275us/sample - loss: 1.820
5e-04
Epoch 764/1000
6/6 [=====] - 0s 315us/sample - loss: 1.807
2e-04
Epoch 765/1000
6/6 [=====] - 0s 361us/sample - loss: 1.794
1e-04
Epoch 766/1000
6/6 [=====] - 0s 393us/sample - loss: 1.781
0e-04
Epoch 767/1000
6/6 [=====] - 0s 372us/sample - loss: 1.768
0e-04
Epoch 768/1000
6/6 [=====] - 0s 303us/sample - loss: 1.755
1e-04
Epoch 769/1000
6/6 [=====] - 0s 312us/sample - loss: 1.742
4e-04
Epoch 770/1000
6/6 [=====] - 0s 331us/sample - loss: 1.729
6e-04
Epoch 771/1000
6/6 [=====] - 0s 377us/sample - loss: 1.717
1e-04
Epoch 772/1000
6/6 [=====] - 0s 294us/sample - loss: 1.704
6e-04
Epoch 773/1000
6/6 [=====] - 0s 289us/sample - loss: 1.692
1e-04
Epoch 774/1000
6/6 [=====] - 0s 296us/sample - loss: 1.679
8e-04
Epoch 775/1000
6/6 [=====] - 0s 308us/sample - loss: 1.667
6e-04
Epoch 776/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.6554
```

e-04
Epoch 777/1000
6/6 [=====] - 0s 348us/sample - loss: 1.643
4e-04
Epoch 778/1000
6/6 [=====] - 0s 344us/sample - loss: 1.631
4e-04
Epoch 779/1000
6/6 [=====] - 0s 325us/sample - loss: 1.619
5e-04
Epoch 780/1000
6/6 [=====] - 0s 312us/sample - loss: 1.607
7e-04
Epoch 781/1000
6/6 [=====] - 0s 403us/sample - loss: 1.596
0e-04
Epoch 782/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.5843
e-04
Epoch 783/1000
6/6 [=====] - 0s 351us/sample - loss: 1.572
8e-04
Epoch 784/1000
6/6 [=====] - 0s 288us/sample - loss: 1.561
4e-04
Epoch 785/1000
6/6 [=====] - 0s 284us/sample - loss: 1.550
0e-04
Epoch 786/1000
6/6 [=====] - 0s 361us/sample - loss: 1.538
7e-04
Epoch 787/1000
6/6 [=====] - 0s 337us/sample - loss: 1.527
5e-04
Epoch 788/1000
6/6 [=====] - 0s 382us/sample - loss: 1.516
3e-04
Epoch 789/1000
6/6 [=====] - 0s 318us/sample - loss: 1.505
3e-04
Epoch 790/1000
6/6 [=====] - 0s 392us/sample - loss: 1.494
3e-04
Epoch 791/1000
6/6 [=====] - 0s 306us/sample - loss: 1.483
4e-04
Epoch 792/1000
6/6 [=====] - 0s 373us/sample - loss: 1.472
6e-04
Epoch 793/1000
6/6 [=====] - 0s 350us/sample - loss: 1.461
9e-04
Epoch 794/1000
6/6 [=====] - 0s 452us/sample - loss: 1.451
2e-04
Epoch 795/1000
6/6 [=====] - 0s 420us/sample - loss: 1.440
7e-04
Epoch 796/1000
6/6 [=====] - 0s 361us/sample - loss: 1.430
2e-04

Epoch 797/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.4198
e-04
Epoch 798/1000
6/6 [=====] - 0s 326us/sample - loss: 1.409
4e-04
Epoch 799/1000
6/6 [=====] - 0s 313us/sample - loss: 1.399
2e-04
Epoch 800/1000
6/6 [=====] - 0s 346us/sample - loss: 1.389
0e-04
Epoch 801/1000
6/6 [=====] - 0s 309us/sample - loss: 1.378
8e-04
Epoch 802/1000
6/6 [=====] - 0s 334us/sample - loss: 1.368
8e-04
Epoch 803/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.3588
e-04
Epoch 804/1000
6/6 [=====] - 0s 290us/sample - loss: 1.348
9e-04
Epoch 805/1000
6/6 [=====] - 0s 292us/sample - loss: 1.339
1e-04
Epoch 806/1000
6/6 [=====] - 0s 370us/sample - loss: 1.329
3e-04
Epoch 807/1000
6/6 [=====] - 0s 369us/sample - loss: 1.319
7e-04
Epoch 808/1000
6/6 [=====] - 0s 364us/sample - loss: 1.310
0e-04
Epoch 809/1000
6/6 [=====] - 0s 340us/sample - loss: 1.300
5e-04
Epoch 810/1000
6/6 [=====] - 0s 369us/sample - loss: 1.291
0e-04
Epoch 811/1000
6/6 [=====] - 0s 356us/sample - loss: 1.281
6e-04
Epoch 812/1000
6/6 [=====] - 0s 383us/sample - loss: 1.272
3e-04
Epoch 813/1000
6/6 [=====] - 0s 365us/sample - loss: 1.263
0e-04
Epoch 814/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.2538
e-04
Epoch 815/1000
6/6 [=====] - 0s 386us/sample - loss: 1.244
7e-04
Epoch 816/1000
6/6 [=====] - 0s 364us/sample - loss: 1.235
6e-04
Epoch 817/1000

```
6/6 [=====] - 0s 366us/sample - loss: 1.226
6e-04
Epoch 818/1000
6/6 [=====] - 0s 329us/sample - loss: 1.217
7e-04
Epoch 819/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.2088
e-04
Epoch 820/1000
6/6 [=====] - 0s 337us/sample - loss: 1.200
0e-04
Epoch 821/1000
6/6 [=====] - 0s 373us/sample - loss: 1.191
3e-04
Epoch 822/1000
6/6 [=====] - 0s 386us/sample - loss: 1.182
6e-04
Epoch 823/1000
6/6 [=====] - 0s 364us/sample - loss: 1.174
0e-04
Epoch 824/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.1654
e-04
Epoch 825/1000
6/6 [=====] - 0s 320us/sample - loss: 1.156
9e-04
Epoch 826/1000
6/6 [=====] - 0s 400us/sample - loss: 1.148
5e-04
Epoch 827/1000
6/6 [=====] - 0s 368us/sample - loss: 1.140
1e-04
Epoch 828/1000
6/6 [=====] - 0s 363us/sample - loss: 1.131
8e-04
Epoch 829/1000
6/6 [=====] - 0s 266us/sample - loss: 1.123
6e-04
Epoch 830/1000
6/6 [=====] - 0s 338us/sample - loss: 1.115
4e-04
Epoch 831/1000
6/6 [=====] - 0s 284us/sample - loss: 1.107
2e-04
Epoch 832/1000
6/6 [=====] - 0s 335us/sample - loss: 1.099
2e-04
Epoch 833/1000
6/6 [=====] - 0s 313us/sample - loss: 1.091
2e-04
Epoch 834/1000
6/6 [=====] - 0s 405us/sample - loss: 1.083
2e-04
Epoch 835/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.0753
e-04
Epoch 836/1000
6/6 [=====] - 0s 482us/sample - loss: 1.067
5e-04
Epoch 837/1000
6/6 [=====] - 0s 360us/sample - loss: 1.059
```

7e-04
Epoch 838/1000
6/6 [=====] - 0s 345us/sample - loss: 1.052
0e-04
Epoch 839/1000
6/6 [=====] - 0s 322us/sample - loss: 1.044
3e-04
Epoch 840/1000
6/6 [=====] - 0s 272us/sample - loss: 1.036
7e-04
Epoch 841/1000
6/6 [=====] - 0s 14ms/sample - loss: 1.0292
e-04
Epoch 842/1000
6/6 [=====] - 0s 457us/sample - loss: 1.021
7e-04
Epoch 843/1000
6/6 [=====] - 0s 278us/sample - loss: 1.014
2e-04
Epoch 844/1000
6/6 [=====] - 0s 334us/sample - loss: 1.006
8e-04
Epoch 845/1000
6/6 [=====] - 0s 383us/sample - loss: 9.995
1e-05
Epoch 846/1000
6/6 [=====] - 0s 296us/sample - loss: 9.922
2e-05
Epoch 847/1000
6/6 [=====] - 0s 14ms/sample - loss: 9.8500
e-05
Epoch 848/1000
6/6 [=====] - 0s 412us/sample - loss: 9.778
1e-05
Epoch 849/1000
6/6 [=====] - 0s 343us/sample - loss: 9.706
9e-05
Epoch 850/1000
6/6 [=====] - 0s 332us/sample - loss: 9.636
2e-05
Epoch 851/1000
6/6 [=====] - 0s 396us/sample - loss: 9.566
1e-05
Epoch 852/1000
6/6 [=====] - 0s 14ms/sample - loss: 9.4963
e-05
Epoch 853/1000
6/6 [=====] - 0s 370us/sample - loss: 9.427
1e-05
Epoch 854/1000
6/6 [=====] - 0s 381us/sample - loss: 9.358
6e-05
Epoch 855/1000
6/6 [=====] - 0s 344us/sample - loss: 9.290
3e-05
Epoch 856/1000
6/6 [=====] - 0s 320us/sample - loss: 9.222
6e-05
Epoch 857/1000
6/6 [=====] - 0s 302us/sample - loss: 9.155
5e-05

```
Epoch 858/1000
6/6 [=====] - 0s 376us/sample - loss: 9.088
7e-05
Epoch 859/1000
6/6 [=====] - 0s 294us/sample - loss: 9.022
5e-05
Epoch 860/1000
6/6 [=====] - 0s 295us/sample - loss: 8.956
8e-05
Epoch 861/1000
6/6 [=====] - 0s 322us/sample - loss: 8.891
5e-05
Epoch 862/1000
6/6 [=====] - 0s 291us/sample - loss: 8.826
7e-05
Epoch 863/1000
6/6 [=====] - 0s 14ms/sample - loss: 8.7625
e-05
Epoch 864/1000
6/6 [=====] - 0s 376us/sample - loss: 8.698
5e-05
Epoch 865/1000
6/6 [=====] - 0s 312us/sample - loss: 8.635
2e-05
Epoch 866/1000
6/6 [=====] - 0s 327us/sample - loss: 8.572
3e-05
Epoch 867/1000
6/6 [=====] - 0s 350us/sample - loss: 8.509
9e-05
Epoch 868/1000
6/6 [=====] - 0s 395us/sample - loss: 8.447
9e-05
Epoch 869/1000
6/6 [=====] - 0s 397us/sample - loss: 8.386
4e-05
Epoch 870/1000
6/6 [=====] - 0s 371us/sample - loss: 8.325
2e-05
Epoch 871/1000
```

In []:

```
# Now click the 'Submit Assignment' button above.
# Once that is complete, please run the following two cells to save your work and close the notebook
```

In []:

```
%%javascript
<!-- Save the notebook -->
IPython.notebook.save_checkpoint();
```

In []: