

```
1 ssh://root@103.254.67.181:10006/usr/bin/  
python -u /home/sunfengzhen/pycharm/  
keras_regress/boston01.py  
2 Using TensorFlow backend.  
3 #####load dataset  
#####  
4 the type of train data is float64  
5 the shape of train data is (404, 13)  
6 the shape of train target is (404,)  
7 the type of train target is float64  
8 train target[:10]: [19.7 23.1 13.5 21.2  
23.1 13.6 22.8 18.2 13.1 23.2]  
9 the shape of test data is (102, 13)  
10 the shape of test target is (102,)  
11 the test_data[-1] is [2.2876e-01 0.  
0000e+00 8.5600e+00 0.0000e+00 5.2000e-  
01 6.4050e+00  
12 8.5400e+01 2.7147e+00 5.0000e+00 3.  
8400e+02 2.0900e+01 7.0800e+01  
13 1.0630e+01]  
14 the test_targets[-1] is 18.6  
15 #####data proecess  
#####  
16 the shape of mean is (13,)
```

```
17 train_data mean = [3.90929507e+00 1.12462871e+01 1.15460396e+01 6.68316832e-
02
18 5.58670792e-01 6.23910891e+00 6.92180693e+01 3.76129010e+00
19 9.93564356e+00 4.17232673e+02 1.85509901e+01 3.53553960e+02
20 1.30622772e+01]
21 the shape of std is (13,)
22 train_data std = [9.08480517e+00 2.37214521e+01 6.95455629e+00 2.49730273e-
01
23 1.17625497e-01 6.71193320e-01 2.79205440e+01 2.12926188e+00
24 8.91715539e+00 1.72002232e+02 2.13935866e+00 9.53648989e+01
25 7.05327838e+00]
26 #####model train
#####
27 train_data.shape[1] = 13
28 model.metrics_names = ['loss', '
mean_absolute_error']
29
```

| | | |
|----|---------------------|------------|
| 30 | Layer (type) | Output |
| | Shape | Param # |
| 31 | ===== | |
| | ===== | |
| 32 | dense_1 (Dense) | (None, 128 |
| |) 1792 | |
| 33 | | |
| | | |
| 34 | dropout_1 (Dropout) | (None, 128 |
| |) 0 | |
| 35 | | |
| | | |
| 36 | dense_2 (Dense) | (None, 128 |
| |) 16512 | |
| 37 | | |
| | | |
| 38 | dropout_2 (Dropout) | (None, 128 |
| |) 0 | |
| 39 | | |
| | | |
| 40 | dense_3 (Dense) | (None, 1 |
| |) 129 | |
| 41 | ===== | |
| | ===== | |

```
42 Total params: 18,433
43 Trainable params: 18,433
44 Non-trainable params: 0
45
46 Train on 323 samples, validate on 81
   samples
47 Epoch 1/1000
48 2019-05-30 09:28:37.181651: I tensorflow
   /core/platform/cpu_feature_guard.cc:141
   ] Your CPU supports instructions that
   this TensorFlow binary was not compiled
   to use: AVX2 FMA
49 2019-05-30 09:28:37.380445: I tensorflow
   /core/common_runtime/gpu/gpu_device.cc:
   1432] Found device 0 with properties:
50 name: GeForce GTX 1080 Ti major: 6 minor
   : 1 memoryClockRate(GHz): 1.582
51 pciBusID: 0000:82:00.0
52 totalMemory: 10.92GiB freeMemory: 364.
   50MiB
53 2019-05-30 09:28:37.380507: I tensorflow
   /core/common_runtime/gpu/gpu_device.cc:
   1511] Adding visible gpu devices: 0
```

```
54 2019-05-30 09:28:37.843813: I tensorflow
   /core/common_runtime/gpu/gpu_device.cc:
   982] Device interconnect StreamExecutor
   with strength 1 edge matrix:
55 2019-05-30 09:28:37.843916: I tensorflow
   /core/common_runtime/gpu/gpu_device.cc:
   988]      0
56 2019-05-30 09:28:37.843929: I tensorflow
   /core/common_runtime/gpu/gpu_device.cc:
   1001] 0:    N
57 2019-05-30 09:28:37.844115: I tensorflow
   /core/common_runtime/gpu/gpu_device.cc:
   1115] Created TensorFlow device (/job:
   localhost/replica:0/task:0/device:GPU:0
   with 75 MB memory) -> physical GPU (
   device: 0, name: GeForce GTX 1080 Ti,
   pci bus id: 0000:82:00.0, compute
   capability: 6.1)
58 - 1s - loss: 427.0405 -
   mean_absolute_error: 18.5200 - val_loss
   : 331.1409 - val_mean_absolute_error: 16
   .2267
59 Epoch 2/1000
60 - 0s - loss: 224.6406 -
```

```
60 mean_absolute_error: 12.6238 - val_loss
   : 137.5063 - val_mean_absolute_error: 9.
5464
61 Epoch 3/1000
62   - 0s - loss: 88.3224 -
   mean_absolute_error: 7.4732 - val_loss:
65.4435 - val_mean_absolute_error: 5.
5452
63 Epoch 4/1000
64   - 0s - loss: 54.2881 -
   mean_absolute_error: 5.4531 - val_loss:
53.4011 - val_mean_absolute_error: 4.
6456
65 Epoch 5/1000
66   - 0s - loss: 46.0317 -
   mean_absolute_error: 4.9315 - val_loss:
48.0364 - val_mean_absolute_error: 4.
2964
67 Epoch 6/1000
68   - 0s - loss: 40.0752 -
   mean_absolute_error: 4.7915 - val_loss:
43.8153 - val_mean_absolute_error: 4.
0356
69 Epoch 7/1000
```

```
70 - 0s - loss: 29.4513 -  
mean_absolute_error: 3.8933 - val_loss:  
39.7215 - val_mean_absolute_error: 3.  
7685
```

```
71 Epoch 8/1000
```

```
72 - 0s - loss: 37.3979 -  
mean_absolute_error: 4.5958 - val_loss:  
35.7610 - val_mean_absolute_error: 3.  
5691
```

```
73 Epoch 9/1000
```

```
74 - 0s - loss: 35.7334 -  
mean_absolute_error: 4.5068 - val_loss:  
35.0510 - val_mean_absolute_error: 3.  
5178
```

```
75 Epoch 10/1000
```

```
76 - 0s - loss: 28.8287 -  
mean_absolute_error: 4.1064 - val_loss:  
32.1370 - val_mean_absolute_error: 3.  
3531
```

```
77
```

```
78 Epoch 0010: saving model to ./model/  
model_best.h5
```

```
79 Epoch 11/1000
```

```
80 - 0s - loss: 31.9574 -
```

```
80 mean_absolute_error: 4.2615 - val_loss
   : 29.6920 - val_mean_absolute_error: 3.
   1827
81 Epoch 12/1000
82   - 0s - loss: 29.6580 -
   mean_absolute_error: 4.0402 - val_loss
   : 29.4502 - val_mean_absolute_error: 3.
   1705
83 Epoch 13/1000
84   - 0s - loss: 31.5717 -
   mean_absolute_error: 4.3175 - val_loss
   : 31.0205 - val_mean_absolute_error: 3.
   2160
85 Epoch 14/1000
86   - 0s - loss: 29.1989 -
   mean_absolute_error: 4.0701 - val_loss
   : 29.4115 - val_mean_absolute_error: 3.
   0535
87 Epoch 15/1000
88   - 0s - loss: 26.6704 -
   mean_absolute_error: 3.8659 - val_loss
   : 31.3975 - val_mean_absolute_error: 3.
   1534
89 Epoch 16/1000
```



```
90 - 0s - loss: 28.5527 -  
mean_absolute_error: 4.0937 - val_loss  
: 28.4316 - val_mean_absolute_error: 2.  
9372  
91 Epoch 17/1000  
92 - 0s - loss: 30.8190 -  
mean_absolute_error: 3.9606 - val_loss  
: 27.1844 - val_mean_absolute_error: 2.  
9878  
93 Epoch 18/1000  
94 - 0s - loss: 28.2967 -  
mean_absolute_error: 3.9969 - val_loss  
: 28.1063 - val_mean_absolute_error: 2.  
9109  
95 Epoch 19/1000  
96 - 0s - loss: 27.9282 -  
mean_absolute_error: 4.0377 - val_loss  
: 27.2194 - val_mean_absolute_error: 2.  
8925  
97 Epoch 20/1000  
98 - 0s - loss: 29.3362 -  
mean_absolute_error: 3.9829 - val_loss  
: 28.1280 - val_mean_absolute_error: 2.  
8795
```

99

100 Epoch 00020: saving model to ./model/
model_best.h5

101 Epoch 21/1000

102 - 0s - loss: 26.1251 -
mean_absolute_error: 3.7098 - val_loss
: 26.5624 - val_mean_absolute_error: 2.
9142

103 Epoch 22/1000

104 - 0s - loss: 26.8349 -
mean_absolute_error: 3.8419 - val_loss
: 30.1793 - val_mean_absolute_error: 3.
0547

105 Epoch 23/1000

106 - 0s - loss: 25.8703 -
mean_absolute_error: 4.0044 - val_loss
: 29.0738 - val_mean_absolute_error: 3.
0210

107 Epoch 24/1000

108 - 0s - loss: 28.8361 -
mean_absolute_error: 4.0331 - val_loss
: 28.0780 - val_mean_absolute_error: 3.
0687

109 Epoch 25/1000

```
110 - 0s - loss: 22.5524 -  
    mean_absolute_error: 3.7239 - val_loss  
    : 27.4662 - val_mean_absolute_error: 3.  
0176  
111 Epoch 26/1000  
112 - 0s - loss: 29.8652 -  
    mean_absolute_error: 3.8721 - val_loss  
    : 24.5729 - val_mean_absolute_error: 2.  
9430  
113 Epoch 27/1000  
114 - 0s - loss: 24.5078 -  
    mean_absolute_error: 3.6997 - val_loss  
    : 25.2085 - val_mean_absolute_error: 2.  
9562  
115 Epoch 28/1000  
116 - 0s - loss: 27.1857 -  
    mean_absolute_error: 3.9413 - val_loss  
    : 25.6167 - val_mean_absolute_error: 2.  
9417  
117 Epoch 29/1000  
118 - 0s - loss: 29.6684 -  
    mean_absolute_error: 3.9804 - val_loss  
    : 25.3995 - val_mean_absolute_error: 2.  
8653
```

```
119 Epoch 30/1000
120   - 0s - loss: 24.9002 -
    mean_absolute_error: 3.6723 - val_loss
    : 25.0092 - val_mean_absolute_error: 2.
    8575
121
122 Epoch 00030: saving model to ./model/
    model_best.h5
123 Epoch 31/1000
124   - 0s - loss: 28.9039 -
    mean_absolute_error: 3.9302 - val_loss
    : 25.2990 - val_mean_absolute_error: 2.
    8339
125 Epoch 32/1000
126   - 0s - loss: 25.7574 -
    mean_absolute_error: 3.7403 - val_loss
    : 27.1751 - val_mean_absolute_error: 2.
    9209
127 Epoch 33/1000
128   - 0s - loss: 27.0758 -
    mean_absolute_error: 3.7936 - val_loss
    : 25.4248 - val_mean_absolute_error: 2.
    9083
129 Epoch 34/1000
```

```
130 - 0s - loss: 23.4923 -  
mean_absolute_error: 3.5929 - val_loss  
: 25.2121 - val_mean_absolute_error: 2.  
7991  
131 Epoch 35/1000  
132 - 0s - loss: 30.2256 -  
mean_absolute_error: 3.8893 - val_loss  
: 26.8087 - val_mean_absolute_error: 2.  
8794  
133 Epoch 36/1000  
134 - 0s - loss: 28.5659 -  
mean_absolute_error: 3.9265 - val_loss  
: 27.4749 - val_mean_absolute_error: 2.  
8869  
135 Epoch 37/1000  
136 - 0s - loss: 25.1805 -  
mean_absolute_error: 3.8989 - val_loss  
: 26.3704 - val_mean_absolute_error: 2.  
9598  
137 Epoch 38/1000  
138 - 0s - loss: 23.5702 -  
mean_absolute_error: 3.6004 - val_loss  
: 25.7401 - val_mean_absolute_error: 2.  
9054
```

```
139 Epoch 39/1000
140   - 0s - loss: 28.1862 -
      mean_absolute_error: 3.9534 - val_loss
      : 25.6433 - val_mean_absolute_error: 2.
      8984
141 Epoch 40/1000
142   - 0s - loss: 21.0255 -
      mean_absolute_error: 3.3780 - val_loss
      : 28.8745 - val_mean_absolute_error: 3.
      2263
143
144 Epoch 00040: saving model to ./model/
      model_best.h5
145 Epoch 41/1000
146   - 0s - loss: 23.2624 -
      mean_absolute_error: 3.5847 - val_loss
      : 24.8577 - val_mean_absolute_error: 2.
      7973
147 Epoch 42/1000
148   - 0s - loss: 21.2206 -
      mean_absolute_error: 3.5199 - val_loss
      : 24.1723 - val_mean_absolute_error: 2.
      9482
149 Epoch 43/1000
```

```
150 - 0s - loss: 24.7059 -  
mean_absolute_error: 3.6032 - val_loss  
: 24.3409 - val_mean_absolute_error: 2.  
8213  
151 Epoch 44/1000  
152 - 0s - loss: 27.1001 -  
mean_absolute_error: 3.8123 - val_loss  
: 24.2184 - val_mean_absolute_error: 2.  
8858  
153 Epoch 45/1000  
154 - 0s - loss: 21.4205 -  
mean_absolute_error: 3.5632 - val_loss  
: 25.5339 - val_mean_absolute_error: 2.  
9608  
155 Epoch 46/1000  
156 - 0s - loss: 25.3215 -  
mean_absolute_error: 3.7111 - val_loss  
: 24.3813 - val_mean_absolute_error: 2.  
7891  
157 Epoch 47/1000  
158 - 0s - loss: 21.1324 -  
mean_absolute_error: 3.4499 - val_loss  
: 24.2828 - val_mean_absolute_error: 2.  
7987
```

```
159 Epoch 48/1000
160   - 0s - loss: 22.7182 -
      mean_absolute_error: 3.5919 - val_loss
      : 23.0533 - val_mean_absolute_error: 3.
1177
161 Epoch 49/1000
162   - 0s - loss: 22.6928 -
      mean_absolute_error: 3.6871 - val_loss
      : 28.0527 - val_mean_absolute_error: 3.
0291
163 Epoch 50/1000
164   - 0s - loss: 26.3238 -
      mean_absolute_error: 3.7693 - val_loss
      : 23.2578 - val_mean_absolute_error: 2.
7488
165
166 Epoch 00050: saving model to ./model/
      model_best.h5
167 Epoch 51/1000
168   - 0s - loss: 24.1634 -
      mean_absolute_error: 3.6773 - val_loss
      : 23.8273 - val_mean_absolute_error: 2.
7137
169 Epoch 52/1000
```



```
170 - 0s - loss: 23.5222 -  
mean_absolute_error: 3.5186 - val_loss  
: 24.8703 - val_mean_absolute_error: 2.  
9294  
171 Epoch 53/1000  
172 - 0s - loss: 26.6477 -  
mean_absolute_error: 3.7514 - val_loss  
: 22.3359 - val_mean_absolute_error: 2.  
7899  
173 Epoch 54/1000  
174 - 0s - loss: 25.0500 -  
mean_absolute_error: 3.6052 - val_loss  
: 25.9586 - val_mean_absolute_error: 3.  
0916  
175 Epoch 55/1000  
176 - 0s - loss: 22.1865 -  
mean_absolute_error: 3.3988 - val_loss  
: 23.6203 - val_mean_absolute_error: 2.  
7508  
177 Epoch 56/1000  
178 - 0s - loss: 21.1726 -  
mean_absolute_error: 3.4825 - val_loss  
: 24.5040 - val_mean_absolute_error: 2.  
7175
```

```
179 Epoch 57/1000
180   - 0s - loss: 20.1084 -
      mean_absolute_error: 3.2668 - val_loss
      : 23.8441 - val_mean_absolute_error: 2.
      8020
181 Epoch 58/1000
182   - 0s - loss: 19.7049 -
      mean_absolute_error: 3.3476 - val_loss
      : 23.3249 - val_mean_absolute_error: 2.
      8372
183 Epoch 59/1000
184   - 0s - loss: 20.0447 -
      mean_absolute_error: 3.4334 - val_loss
      : 22.8324 - val_mean_absolute_error: 3.
      0520
185 Epoch 60/1000
186   - 0s - loss: 25.4885 -
      mean_absolute_error: 3.6021 - val_loss
      : 22.8131 - val_mean_absolute_error: 2.
      8112
187
188 Epoch 00060: saving model to ./model/
      model_best.h5
189 Epoch 61/1000
```

```
190 - 0s - loss: 25.7785 -  
    mean_absolute_error: 3.7262 - val_loss  
    : 24.6042 - val_mean_absolute_error: 2.  
    8482
```

```
191
```

```
192 Epoch 00061: ReduceLROnPlateau reducing  
    learning rate to 0.000100000000475.
```

```
193 Epoch 62/1000
```

```
194 - 0s - loss: 18.7097 -  
    mean_absolute_error: 3.2863 - val_loss  
    : 24.3548 - val_mean_absolute_error: 2.  
    8464
```

```
195 Epoch 63/1000
```

```
196 - 0s - loss: 20.6297 -  
    mean_absolute_error: 3.4242 - val_loss  
    : 24.3110 - val_mean_absolute_error: 2.  
    8367
```

```
197 Epoch 64/1000
```

```
198 - 0s - loss: 21.1384 -  
    mean_absolute_error: 3.3519 - val_loss  
    : 24.0206 - val_mean_absolute_error: 2.  
    8333
```

```
199 Epoch 65/1000
```

```
200 - 0s - loss: 21.8263 -
```

```
200 mean_absolute_error: 3.4525 - val_loss
    : 24.0658 - val_mean_absolute_error: 2.
8176
201 Epoch 66/1000
202   - 0s - loss: 19.1168 -
    mean_absolute_error: 3.3487 - val_loss
    : 24.0913 - val_mean_absolute_error: 2.
8201
203 Epoch 67/1000
204   - 0s - loss: 20.1709 -
    mean_absolute_error: 3.3596 - val_loss
    : 24.0762 - val_mean_absolute_error: 2.
8139
205 Epoch 68/1000
206   - 0s - loss: 20.4881 -
    mean_absolute_error: 3.3200 - val_loss
    : 23.8018 - val_mean_absolute_error: 2.
8102
207 Epoch 69/1000
208   - 0s - loss: 20.1196 -
    mean_absolute_error: 3.3890 - val_loss
    : 23.8540 - val_mean_absolute_error: 2.
8082
209 Epoch 70/1000
```

```
210 - 0s - loss: 19.6668 -  
mean_absolute_error: 3.4687 - val_loss  
: 24.0223 - val_mean_absolute_error: 2.  
8109
```

211

```
212 Epoch 00070: saving model to ./model/  
model_best.h5
```

```
213 Epoch 71/1000
```

```
214 - 0s - loss: 23.0597 -  
mean_absolute_error: 3.4787 - val_loss  
: 24.1454 - val_mean_absolute_error: 2.  
8082
```

215

```
216 Epoch 00071: ReduceLROnPlateau reducing  
learning rate to 1.0000000475e-05.
```

```
217 Epoch 72/1000
```

```
218 - 0s - loss: 22.6350 -  
mean_absolute_error: 3.3419 - val_loss  
: 24.1418 - val_mean_absolute_error: 2.  
8070
```

```
219 Epoch 73/1000
```

```
220 - 0s - loss: 22.8024 -  
mean_absolute_error: 3.6185 - val_loss  
: 24.1593 - val_mean_absolute_error: 2.
```

```
220 8076
221 Epoch 74/1000
222   - 0s - loss: 21.4565 -
    mean_absolute_error: 3.5573 - val_loss
    : 24.1559 - val_mean_absolute_error: 2.
    8090
223 Epoch 75/1000
224   - 0s - loss: 20.2535 -
    mean_absolute_error: 3.3983 - val_loss
    : 24.1846 - val_mean_absolute_error: 2.
    8102
225 Epoch 76/1000
226   - 0s - loss: 23.3924 -
    mean_absolute_error: 3.5798 - val_loss
    : 24.1606 - val_mean_absolute_error: 2.
    8086
227 Epoch 77/1000
228   - 0s - loss: 22.3529 -
    mean_absolute_error: 3.4507 - val_loss
    : 24.1186 - val_mean_absolute_error: 2.
    8067
229 Epoch 78/1000
230   - 0s - loss: 25.5254 -
    mean_absolute_error: 3.6401 - val_loss
```

```
230 : 24.0850 - val_mean_absolute_error: 2.
    8049
231 Epoch 79/1000
232 - 0s - loss: 23.6385 -
    mean_absolute_error: 3.5382 - val_loss
    : 24.0647 - val_mean_absolute_error: 2.
    8042
233 Epoch 80/1000
234 - 0s - loss: 21.6272 -
    mean_absolute_error: 3.4895 - val_loss
    : 24.0319 - val_mean_absolute_error: 2.
    8030
235
236 Epoch 00080: saving model to ./model/
    model_best.h5
237 Epoch 81/1000
238 - 0s - loss: 25.0509 -
    mean_absolute_error: 3.5242 - val_loss
    : 24.0459 - val_mean_absolute_error: 2.
    8029
239
240 Epoch 00081: ReduceLROnPlateau reducing
    learning rate to 1.00000006569e-06.
241 Epoch 82/1000
```

```
242 - 0s - loss: 20.9182 -  
mean_absolute_error: 3.3131 - val_loss  
: 24.0444 - val_mean_absolute_error: 2.  
8029  
243 Epoch 83/1000  
244 - 0s - loss: 17.9361 -  
mean_absolute_error: 3.1819 - val_loss  
: 24.0438 - val_mean_absolute_error: 2.  
8029  
245 Epoch 84/1000  
246 - 0s - loss: 22.9021 -  
mean_absolute_error: 3.6009 - val_loss  
: 24.0421 - val_mean_absolute_error: 2.  
8028  
247 Epoch 85/1000  
248 - 0s - loss: 19.1412 -  
mean_absolute_error: 3.1681 - val_loss  
: 24.0372 - val_mean_absolute_error: 2.  
8027  
249 Epoch 86/1000  
250 - 0s - loss: 20.5763 -  
mean_absolute_error: 3.4539 - val_loss  
: 24.0372 - val_mean_absolute_error: 2.  
8027
```



```
251 Epoch 87/1000
252   - 0s - loss: 22.3356 -
    mean_absolute_error: 3.5253 - val_loss
    : 24.0377 - val_mean_absolute_error: 2.
    8026
253 Epoch 88/1000
254   - 0s - loss: 21.5033 -
    mean_absolute_error: 3.4971 - val_loss
    : 24.0356 - val_mean_absolute_error: 2.
    8026
255 Epoch 89/1000
256   - 0s - loss: 23.1869 -
    mean_absolute_error: 3.5092 - val_loss
    : 24.0357 - val_mean_absolute_error: 2.
    8025
257 Epoch 90/1000
258   - 0s - loss: 23.7770 -
    mean_absolute_error: 3.3814 - val_loss
    : 24.0363 - val_mean_absolute_error: 2.
    8025
259
260 Epoch 00090: saving model to ./model/
    model_best.h5
261 Epoch 91/1000
```

```
262 - 0s - loss: 23.5737 -  
mean_absolute_error: 3.6795 - val_loss  
: 24.0328 - val_mean_absolute_error: 2.  
8024
```

```
263
```

```
264 Epoch 00091: ReduceLROnPlateau reducing  
learning rate to 1e-06.
```

```
265 Epoch 92/1000
```

```
266 - 0s - loss: 20.1668 -  
mean_absolute_error: 3.2943 - val_loss  
: 24.0301 - val_mean_absolute_error: 2.  
8023
```

```
267 Epoch 93/1000
```

```
268 - 0s - loss: 20.1756 -  
mean_absolute_error: 3.3851 - val_loss  
: 24.0277 - val_mean_absolute_error: 2.  
8023
```

```
269 Epoch 94/1000
```

```
270 - 0s - loss: 18.8411 -  
mean_absolute_error: 3.1802 - val_loss  
: 24.0242 - val_mean_absolute_error: 2.  
8022
```

```
271 Epoch 95/1000
```

```
272 - 0s - loss: 19.3846 -
```

```
272 mean_absolute_error: 3.2778 - val_loss
    : 24.0234 - val_mean_absolute_error: 2.
8022
273 Epoch 96/1000
274   - 0s - loss: 20.3527 -
    mean_absolute_error: 3.4651 - val_loss
    : 24.0228 - val_mean_absolute_error: 2.
8022
275 Epoch 97/1000
276   - 0s - loss: 21.6819 -
    mean_absolute_error: 3.3890 - val_loss
    : 24.0255 - val_mean_absolute_error: 2.
8023
277 Epoch 98/1000
278   - 0s - loss: 24.5211 -
    mean_absolute_error: 3.6994 - val_loss
    : 24.0248 - val_mean_absolute_error: 2.
8024
279 Epoch 99/1000
280   - 0s - loss: 24.6734 -
    mean_absolute_error: 3.6175 - val_loss
    : 24.0201 - val_mean_absolute_error: 2.
8022
281 Epoch 100/1000
```

```
282 - 0s - loss: 19.4325 -  
mean_absolute_error: 3.2798 - val_loss  
: 24.0162 - val_mean_absolute_error: 2.  
8021
```

283

```
284 Epoch 00100: saving model to ./model/  
model_best.h5
```

```
285 Epoch 101/1000
```

```
286 - 0s - loss: 18.1046 -  
mean_absolute_error: 3.2921 - val_loss  
: 24.0145 - val_mean_absolute_error: 2.  
8021
```

```
287 Epoch 102/1000
```

```
288 - 0s - loss: 21.3164 -  
mean_absolute_error: 3.4578 - val_loss  
: 24.0185 - val_mean_absolute_error: 2.  
8021
```

```
289 Epoch 103/1000
```

```
290 - 0s - loss: 21.6397 -  
mean_absolute_error: 3.4485 - val_loss  
: 24.0151 - val_mean_absolute_error: 2.  
8020
```

```
291 Epoch 104/1000
```

```
292 - 0s - loss: 21.6648 -
```

```
292 mean_absolute_error: 3.3471 - val_loss
    : 24.0130 - val_mean_absolute_error: 2.
8019
293 Epoch 105/1000
294   - 0s - loss: 19.6188 -
    mean_absolute_error: 3.3537 - val_loss
    : 24.0133 - val_mean_absolute_error: 2.
8021
295 Epoch 106/1000
296   - 0s - loss: 20.4519 -
    mean_absolute_error: 3.4663 - val_loss
    : 24.0094 - val_mean_absolute_error: 2.
8020
297 Epoch 107/1000
298   - 0s - loss: 19.1054 -
    mean_absolute_error: 3.2499 - val_loss
    : 24.0077 - val_mean_absolute_error: 2.
8019
299 Epoch 108/1000
300   - 0s - loss: 23.3942 -
    mean_absolute_error: 3.4747 - val_loss
    : 24.0061 - val_mean_absolute_error: 2.
8019
301 Epoch 109/1000
```

```
302 - 0s - loss: 21.7785 -  
mean_absolute_error: 3.4588 - val_loss  
: 24.0039 - val_mean_absolute_error: 2.  
8018  
303 Epoch 110/1000  
304 - 0s - loss: 21.4543 -  
mean_absolute_error: 3.3639 - val_loss  
: 24.0000 - val_mean_absolute_error: 2.  
8017  
305  
306 Epoch 00110: saving model to ./model/  
model_best.h5  
307 Epoch 111/1000  
308 - 0s - loss: 27.1176 -  
mean_absolute_error: 3.7085 - val_loss  
: 23.9979 - val_mean_absolute_error: 2.  
8016  
309 Epoch 112/1000  
310 - 0s - loss: 23.1838 -  
mean_absolute_error: 3.6193 - val_loss  
: 23.9948 - val_mean_absolute_error: 2.  
8016  
311 Epoch 113/1000  
312 - 0s - loss: 21.2160 -
```

```
312 mean_absolute_error: 3.3871 - val_loss
    : 23.9918 - val_mean_absolute_error: 2.
8015
313 Epoch 114/1000
314   - 0s - loss: 22.7095 -
    mean_absolute_error: 3.5555 - val_loss
    : 23.9874 - val_mean_absolute_error: 2.
8013
315 Epoch 115/1000
316   - 0s - loss: 21.5242 -
    mean_absolute_error: 3.3923 - val_loss
    : 23.9885 - val_mean_absolute_error: 2.
8014
317 Epoch 116/1000
318   - 0s - loss: 22.0394 -
    mean_absolute_error: 3.3838 - val_loss
    : 23.9865 - val_mean_absolute_error: 2.
8014
319 Epoch 117/1000
320   - 0s - loss: 23.2013 -
    mean_absolute_error: 3.5293 - val_loss
    : 23.9839 - val_mean_absolute_error: 2.
8014
321 Epoch 118/1000
```

```
322 - 0s - loss: 25.0002 -  
mean_absolute_error: 3.7939 - val_loss  
: 23.9832 - val_mean_absolute_error: 2.  
8013  
323 Epoch 119/1000  
324 - 0s - loss: 22.6679 -  
mean_absolute_error: 3.4610 - val_loss  
: 23.9810 - val_mean_absolute_error: 2.  
8013  
325 Epoch 120/1000  
326 - 0s - loss: 22.1756 -  
mean_absolute_error: 3.5349 - val_loss  
: 23.9817 - val_mean_absolute_error: 2.  
8013  
327  
328 Epoch 00120: saving model to ./model/  
model_best.h5  
329 Epoch 121/1000  
330 - 0s - loss: 21.7710 -  
mean_absolute_error: 3.5289 - val_loss  
: 23.9802 - val_mean_absolute_error: 2.  
8012  
331 Epoch 122/1000  
332 - 0s - loss: 24.0334 -
```



```
332 mean_absolute_error: 3.4736 - val_loss
    : 23.9782 - val_mean_absolute_error: 2.
8011
333 Epoch 123/1000
334   - 0s - loss: 25.2803 -
    mean_absolute_error: 3.6895 - val_loss
    : 23.9786 - val_mean_absolute_error: 2.
8010
335 Epoch 124/1000
336   - 0s - loss: 22.2449 -
    mean_absolute_error: 3.4004 - val_loss
    : 23.9769 - val_mean_absolute_error: 2.
8011
337 Epoch 125/1000
338   - 0s - loss: 22.5976 -
    mean_absolute_error: 3.4151 - val_loss
    : 23.9738 - val_mean_absolute_error: 2.
8009
339 Epoch 126/1000
340   - 0s - loss: 18.3225 -
    mean_absolute_error: 3.2600 - val_loss
    : 23.9692 - val_mean_absolute_error: 2.
8008
341 Epoch 127/1000
```

```
342 - 0s - loss: 20.7321 -  
mean_absolute_error: 3.5034 - val_loss  
: 23.9746 - val_mean_absolute_error: 2.  
8009  
343 Epoch 128/1000  
344 - 0s - loss: 20.5536 -  
mean_absolute_error: 3.3479 - val_loss  
: 23.9692 - val_mean_absolute_error: 2.  
8008  
345 Epoch 129/1000  
346 - 0s - loss: 22.3251 -  
mean_absolute_error: 3.4722 - val_loss  
: 23.9677 - val_mean_absolute_error: 2.  
8007  
347 Epoch 130/1000  
348 - 0s - loss: 21.5504 -  
mean_absolute_error: 3.4051 - val_loss  
: 23.9653 - val_mean_absolute_error: 2.  
8007  
349  
350 Epoch 00130: saving model to ./model/  
model_best.h5  
351 Epoch 131/1000  
352 - 0s - loss: 21.9423 -
```

```
352 mean_absolute_error: 3.2865 - val_loss
    : 23.9631 - val_mean_absolute_error: 2.
8007
353 Epoch 132/1000
354   - 0s - loss: 21.6724 -
    mean_absolute_error: 3.4492 - val_loss
    : 23.9605 - val_mean_absolute_error: 2.
8007
355 Epoch 133/1000
356   - 0s - loss: 20.2954 -
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    : 23.9548 - val_mean_absolute_error: 2.
8006
357 Epoch 134/1000
358   - 0s - loss: 20.8625 -
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    : 23.9500 - val_mean_absolute_error: 2.
8005
359 Epoch 135/1000
360   - 0s - loss: 20.3280 -
    mean_absolute_error: 3.3080 - val_loss
    : 23.9469 - val_mean_absolute_error: 2.
8005
361 Epoch 136/1000
```

```
362 - 0s - loss: 23.1333 -  
mean_absolute_error: 3.4263 - val_loss  
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8004  
363 Epoch 137/1000  
364 - 0s - loss: 21.4712 -  
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: 23.9462 - val_mean_absolute_error: 2.  
8004  
365 Epoch 138/1000  
366 - 0s - loss: 20.9674 -  
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8004  
367 Epoch 139/1000  
368 - 0s - loss: 21.9481 -  
mean_absolute_error: 3.5407 - val_loss  
: 23.9475 - val_mean_absolute_error: 2.  
8003  
369 Epoch 140/1000  
370 - 0s - loss: 20.4510 -  
mean_absolute_error: 3.3436 - val_loss  
: 23.9474 - val_mean_absolute_error: 2.  
8003
```

371

372 Epoch 00140: saving model to ./model/
model_best.h5

373 Epoch 141/1000

374 - 0s - loss: 20.3671 -
mean_absolute_error: 3.3630 - val_loss
: 23.9470 - val_mean_absolute_error: 2.
8003

375 Epoch 142/1000

376 - 0s - loss: 21.9163 -
mean_absolute_error: 3.5350 - val_loss
: 23.9437 - val_mean_absolute_error: 2.
8002

377 Epoch 143/1000

378 - 0s - loss: 24.0279 -
mean_absolute_error: 3.6130 - val_loss
: 23.9479 - val_mean_absolute_error: 2.
8003

379 Epoch 144/1000

380 - 0s - loss: 22.0966 -
mean_absolute_error: 3.5057 - val_loss
: 23.9466 - val_mean_absolute_error: 2.
8002

381 Epoch 145/1000

```
382 - 0s - loss: 19.2530 -  
mean_absolute_error: 3.2263 - val_loss  
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383 Epoch 146/1000  
384 - 0s - loss: 24.2714 -  
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385 Epoch 147/1000  
386 - 0s - loss: 19.7671 -  
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387 Epoch 148/1000  
388 - 0s - loss: 21.8589 -  
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8002  
389 Epoch 149/1000  
390 - 0s - loss: 20.2128 -  
mean_absolute_error: 3.3436 - val_loss  
: 23.9350 - val_mean_absolute_error: 2.  
8002
```

```

391 Epoch 150/1000
392   - 0s - loss: 24.9518 -
    mean_absolute_error: 3.5507 - val_loss
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    8001
393
394 Epoch 00150: saving model to ./model/
    model_best.h5
395 Epoch 151/1000
396   - 0s - loss: 21.1844 -
    mean_absolute_error: 3.4928 - val_loss
    : 23.9293 - val_mean_absolute_error: 2.
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397 Epoch 00151: early stopping
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415 Process finished with exit code 0
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