```
D:\anaconda3\envs\tf2_cpu\python.exe "D:/PyCharm 2023.1.4/plugins/python/helpers/pydev/pydevconsole.py" --mode=client --host=127.0.0.1 --port=55319

import sys; print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['G:\\FIT3164_04'])

Python 3.9.17 (main, Jul  5 2023, 21:22:06) [MSC v.1916 64 bit (AMD64)]
Type 'copyright', 'credits' or 'license' for more information
IPython 8.12.0 -- An enhanced Interactive Python. Type '?' for help.
PyDev console: using IPython 8.12.0

Python 3.9.17 (main, Jul  5 2023, 21:22:06) [MSC v.1916 64 bit (AMD64)] on win32
In [2]: runfile('G:\\FIT3164_04\\sales_ml.py', wdir='G:\\FIT3164_04')
Epoch 1/20
23/23 [==============================] - 29s 344ms/step - loss: 160.0489 - mean_squared_error: 33939.2227 - val_loss: 146.6021 - val_mean_squared_error: 26027.8809
Epoch 2/20
23/23 [==============================] - 2s 99ms/step - loss: 154.1419 - mean_squared_error: 33299.4219 - val_loss: 146.4469 - val_mean_squared_error: 25966.2500
Epoch 3/20
23/23 [==============================] - 2s 101ms/step - loss: 158.5012 - mean_squared_error: 33270.0898 - val_loss: 146.3827 - val_mean_squared_error: 25938.4531
Epoch 4/20
23/23 [==============================] - 2s 100ms/step - loss: 153.3687 - mean_squared_error: 33249.9688 - val_loss: 146.4092 - val_mean_squared_error: 25950.1074
Epoch 5/20
23/23 [==============================] - 2s 101ms/step - loss: 156.1582 - mean_squared_error: 33258.3359 - val_loss: 146.3324 - val_mean_squared_error: 25914.8281
Epoch 6/20
23/23 [==============================] - 2s 93ms/step - loss: 152.7067 - mean_squared_error: 33232.9805 -
```

```
24 val_loss: 146.3547 - val_mean_squared_error: 25925.
   6348
25 Epoch 7/20
26 23/23 [==============================] - 2s 98ms/step
    - loss: 152.4862 - mean_squared_error: 33235.9375 -
   val_loss: 146.3875 - val_mean_squared_error: 25940.
   6055
27 Epoch 8/20
28 23/23 [==============================] - 2s 98ms/step
    - loss: 156.7860 - mean_squared_error: 33250.1680 -
   val_loss: 146.3932 - val_mean_squared_error: 25943.
   1621
29 Epoch 9/20
30 23/23 [==============================] - 2s 96ms/step
    - loss: 157.1908 - mean_squared_error: 33250.9023 -
   val_loss: 146.3965 - val_mean_squared_error: 25944.
   5391
31 Epoch 10/20
32 23/23 [==============================] - 2s 94ms/step
    - loss: 157.1787 - mean_squared_error: 33246.6094 -
   val_loss: 146.3845 - val_mean_squared_error: 25939.
   1562
33 Epoch 11/20
34 23/23 [==============================] - 2s 98ms/step
    - loss: 160.1676 - mean_squared_error: 33246.1055 -
   val_loss: 146.3926 - val_mean_squared_error: 25942.
   7305
35 Epoch 12/20
36 23/23 [==============================] - 2s 96ms/step
    - loss: 153.6527 - mean_squared_error: 33253.2422 -
   val_loss: 146.3372 - val_mean_squared_error: 25917.
   0488
37 Epoch 13/20
38 23/23 [==============================] - 2s 98ms/step
    - loss: 155.3352 - mean_squared_error: 33227.3828 -
   val_loss: 146.3687 - val_mean_squared_error: 25931.
   9102
39 Epoch 14/20
40 23/23 [==============================] - 3s 112ms/
   step - loss: 155.1052 - mean_squared_error: 33238.
   4258 - val_loss: 146.3675 - val_mean_squared_error:
   25931.3828
41 Epoch 15/20
42 23/23 [==============================] - 3s 115ms/
   step - loss: 155.6055 - mean_squared_error: 33242.
   2344 - val_loss: 146.3343 - val_mean_squared_error:
   25915.4980
43 Epoch 16/20
```

```
23/23 [==============================] - 2s 103ms/step - loss: 157.2652 - mean_squared_error: 33227.5586 - val_loss: 146.3488 - val_mean_squared_error: 25922.5176
Epoch 17/20
23/23 [==============================] - 2s 93ms/step - loss: 158.1404 - mean_squared_error: 33230.7422 - val_loss: 146.3534 - val_mean_squared_error: 25924.6289
Epoch 18/20
23/23 [==============================] - 2s 99ms/step - loss: 158.4108 - mean_squared_error: 33235.1953 - val_loss: 146.3558 - val_mean_squared_error: 25925.7246
Epoch 19/20
23/23 [==============================] - 3s 119ms/step - loss: 157.8214 - mean_squared_error: 33234.4375 - val_loss: 146.3771 - val_mean_squared_error: 25935.4902
Epoch 20/20
23/23 [==============================] - 2s 97ms/step - loss: 150.5837 - mean_squared_error: 33252.1289 - val_loss: 146.3390 - val_mean_squared_error: 25917.5801
Model trained on FOODS_1.csv: RMSE=146.3390
D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\src\engine\training.py:3079: UserWarning: You are saving your model as an HDF5 file via `model.save()`. This file format is considered legacy. We recommend using instead the native Keras format, e.g. `model.save('my_model.keras')`.
  saving_api.save_model(
Model saved as FOODS_1_rnn_model.h5
Epoch 1/20
35/35 [==============================] - 20s 187ms/step - loss: 126.3641 - mean_squared_error: 18188.6191 - val_loss: 107.0498 - val_mean_squared_error: 12392.6602
Epoch 2/20
35/35 [==============================] - 3s 91ms/step - loss: 125.5597 - mean_squared_error: 17914.1621 - val_loss: 107.1418 - val_mean_squared_error: 12397.1611
Epoch 3/20
35/35 [==============================] - 3s 93ms/step - loss: 126.1431 - mean_squared_error: 17921.0449 - val_loss: 107.1030 - val_mean_squared_error: 12387.6826
```

```
Epoch 4/20
35/35 [==============================] - 4s 109ms/step - loss: 125.7942 - mean_squared_error: 17913.9590 - val_loss: 107.0939 - val_mean_squared_error: 12389.6445
Epoch 5/20
35/35 [==============================] - 3s 97ms/step - loss: 126.3904 - mean_squared_error: 17901.3398 - val_loss: 107.1130 - val_mean_squared_error: 12392.2754
Epoch 6/20
35/35 [==============================] - 3s 96ms/step - loss: 123.2371 - mean_squared_error: 17898.2051 - val_loss: 107.1471 - val_mean_squared_error: 12397.0850
Epoch 7/20
35/35 [==============================] - 3s 96ms/step - loss: 127.0690 - mean_squared_error: 17888.2891 - val_loss: 107.1766 - val_mean_squared_error: 12399.4316
Epoch 8/20
35/35 [==============================] - 3s 96ms/step - loss: 126.1478 - mean_squared_error: 17887.9375 - val_loss: 107.2210 - val_mean_squared_error: 12403.5928
Epoch 9/20
35/35 [==============================] - 4s 101ms/step - loss: 126.1986 - mean_squared_error: 17883.2871 - val_loss: 107.1959 - val_mean_squared_error: 12401.2109
Epoch 10/20
35/35 [==============================] - 3s 96ms/step - loss: 122.0631 - mean_squared_error: 17898.7109 - val_loss: 107.1337 - val_mean_squared_error: 12394.7324
Epoch 11/20
35/35 [==============================] - 3s 94ms/step - loss: 125.2949 - mean_squared_error: 17883.9258 - val_loss: 106.8165 - val_mean_squared_error: 12336.0723
Epoch 12/20
35/35 [==============================] - 3s 98ms/step - loss: 124.3153 - mean_squared_error: 17910.4453 - val_loss: 106.6726 - val_mean_squared_error: 12302.4043
Epoch 13/20
35/35 [==============================] - 3s 99ms/step - loss: 127.7648 - mean_squared_error: 17853.
```

```
 82 1758 - val_loss: 106.6351 - val_mean_squared_error:
    12298.3887
 83 Epoch 14/20
 84 35/35 [==============================] - 3s 97ms/
    step - loss: 125.6310 - mean_squared_error: 17862.
    0684 - val_loss: 106.8742 - val_mean_squared_error:
    12330.3691
 85 Epoch 15/20
 86 35/35 [==============================] - 3s 97ms/
    step - loss: 126.5832 - mean_squared_error: 17842.
    8477 - val_loss: 106.8040 - val_mean_squared_error:
    12318.8203
 87 Epoch 16/20
 88 35/35 [==============================] - 4s 104ms/
    step - loss: 124.2443 - mean_squared_error: 17846.
    9922 - val_loss: 106.6213 - val_mean_squared_error:
    12297.9316
 89 Epoch 17/20
 90 35/35 [==============================] - 4s 107ms/
    step - loss: 125.8215 - mean_squared_error: 17838.
    8672 - val_loss: 106.5942 - val_mean_squared_error:
    12289.1338
 91 Epoch 18/20
 92 35/35 [==============================] - 4s 102ms/
    step - loss: 124.8140 - mean_squared_error: 17838.
    1582 - val_loss: 106.6123 - val_mean_squared_error:
    12286.7627
 93 Epoch 19/20
 94 35/35 [==============================] - 3s 96ms/
    step - loss: 125.2041 - mean_squared_error: 17847.
    8789 - val_loss: 106.7637 - val_mean_squared_error:
    12309.9102
 95 Epoch 20/20
 96 35/35 [==============================] - 3s 97ms/
    step - loss: 125.9327 - mean_squared_error: 17845.
    6719 - val_loss: 107.1294 - val_mean_squared_error:
    12379.1914
 97 Model trained on FOODS_2.csv: RMSE=107.1294
 98 D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\
    src\engine\training.py:3079: UserWarning: You are
    saving your model as an HDF5 file via `model.save
    ()`. This file format is considered legacy. We
    recommend using instead the native Keras format, e.g
    . `model.save('my_model.keras')`.
 99   saving_api.save_model(
100 Model saved as FOODS_2_rnn_model.h5
101 Epoch 1/20
102 67/67 [==============================] - 23s 134ms/
```

```
102 step - loss: 132.6799 - mean_squared_error: 27205.
    7637 - val_loss: 173.5762 - val_mean_squared_error:
    85950.2891
103 Epoch 2/20
104 67/67 [==============================] - 6s 87ms/
    step - loss: 132.1936 - mean_squared_error: 27084.
    3789 - val_loss: 173.5255 - val_mean_squared_error:
    85899.1172
105 Epoch 3/20
106 67/67 [==============================] - 6s 88ms/
    step - loss: 131.9881 - mean_squared_error: 27075.
    1816 - val_loss: 173.5947 - val_mean_squared_error:
    85839.2109
107 Epoch 4/20
108 67/67 [==============================] - 8s 120ms/
    step - loss: 132.9126 - mean_squared_error: 27057.
    6641 - val_loss: 173.6427 - val_mean_squared_error:
    85898.0781
109 Epoch 5/20
110 67/67 [==============================] - 8s 124ms/
    step - loss: 131.4512 - mean_squared_error: 27084.
    5762 - val_loss: 173.6923 - val_mean_squared_error:
    85881.3906
111 Epoch 6/20
112 67/67 [==============================] - 8s 115ms/
    step - loss: 130.2342 - mean_squared_error: 27071.
    7070 - val_loss: 173.6322 - val_mean_squared_error:
    85810.6406
113 Epoch 7/20
114 67/67 [==============================] - 8s 120ms/
    step - loss: 132.5762 - mean_squared_error: 27055.
    9746 - val_loss: 173.5749 - val_mean_squared_error:
    85833.9297
115 Epoch 8/20
116 67/67 [==============================] - 7s 110ms/
    step - loss: 130.5326 - mean_squared_error: 27055.
    3945 - val_loss: 173.5782 - val_mean_squared_error:
    85904.7188
117 Epoch 9/20
118 67/67 [==============================] - 7s 103ms/
    step - loss: 132.2517 - mean_squared_error: 27086.
    2383 - val_loss: 173.8351 - val_mean_squared_error:
    85972.3672
119 Epoch 10/20
120 67/67 [==============================] - 7s 109ms/
    step - loss: 131.1705 - mean_squared_error: 27079.
    6797 - val_loss: 173.7825 - val_mean_squared_error:
    85920.9609
```

```
121 Epoch 11/20
122 67/67 [==============================] - 7s 109ms/
    step - loss: 132.1145 - mean_squared_error: 27088.
    9785 - val_loss: 173.6176 - val_mean_squared_error:
    85859.8594
123 Epoch 12/20
124 67/67 [==============================] - 7s 107ms/
    step - loss: 132.5288 - mean_squared_error: 27066.
    4375 - val_loss: 173.7563 - val_mean_squared_error:
    85881.3672
125 Epoch 13/20
126 67/67 [==============================] - 7s 111ms/
    step - loss: 133.0041 - mean_squared_error: 27059.
    4590 - val_loss: 173.6255 - val_mean_squared_error:
    85842.8047
127 Epoch 14/20
128 67/67 [==============================] - 6s 91ms/
    step - loss: 132.0912 - mean_squared_error: 27076.
    7988 - val_loss: 173.6710 - val_mean_squared_error:
    85898.3984
129 Epoch 15/20
130 67/67 [==============================] - 6s 91ms/
    step - loss: 131.8975 - mean_squared_error: 27063.
    3145 - val_loss: 173.5037 - val_mean_squared_error:
    85842.7969
131 Epoch 16/20
132 67/67 [==============================] - 6s 95ms/
    step - loss: 130.5054 - mean_squared_error: 27051.
    3262 - val_loss: 173.7651 - val_mean_squared_error:
    85982.0469
133 Epoch 17/20
134 67/67 [==============================] - 6s 92ms/
    step - loss: 130.3367 - mean_squared_error: 27097.
    6836 - val_loss: 173.6646 - val_mean_squared_error:
    85899.1328
135 Epoch 18/20
136 67/67 [==============================] - 6s 92ms/
    step - loss: 131.8659 - mean_squared_error: 27078.
    8770 - val_loss: 173.7092 - val_mean_squared_error:
    85918.6641
137 Epoch 19/20
138 67/67 [==============================] - 6s 95ms/
    step - loss: 131.6711 - mean_squared_error: 27067.
    6113 - val_loss: 173.8342 - val_mean_squared_error:
    86028.7422
139 Epoch 20/20
140 67/67 [==============================] - 6s 91ms/
    step - loss: 130.9521 - mean_squared_error: 27084.
```

```
8750 - val_loss: 173.6745 - val_mean_squared_error:
    85915.0547
Model trained on FOODS_3.csv: RMSE=173.6745
D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\
    src\engine\training.py:3079: UserWarning: You are
    saving your model as an HDF5 file via `model.save
    ()`. This file format is considered legacy. We
    recommend using instead the native Keras format, e.g
    . `model.save('my_model.keras')`.
  saving_api.save_model(
Model saved as FOODS_3_rnn_model.h5
Epoch 1/20
24/24 [==============================] - 19s 209ms/
    step - loss: 190.3474 - mean_squared_error: 128706.
    6250 - val_loss: 207.0133 - val_mean_squared_error:
    88388.0234
Epoch 2/20
24/24 [==============================] - 2s 89ms/
    step - loss: 189.7289 - mean_squared_error: 128312.
    6797 - val_loss: 206.9633 - val_mean_squared_error:
    88340.2188
Epoch 3/20
24/24 [==============================] - 2s 93ms/
    step - loss: 187.0013 - mean_squared_error: 128421.
    1875 - val_loss: 207.1022 - val_mean_squared_error:
    88416.6484
Epoch 4/20
24/24 [==============================] - 2s 97ms/
    step - loss: 189.3718 - mean_squared_error: 128378.
    9688 - val_loss: 207.0902 - val_mean_squared_error:
    88394.6406
Epoch 5/20
24/24 [==============================] - 2s 94ms/
    step - loss: 192.0175 - mean_squared_error: 128390.
    9844 - val_loss: 207.0281 - val_mean_squared_error:
    88378.0625
Epoch 6/20
24/24 [==============================] - 2s 93ms/
    step - loss: 191.2784 - mean_squared_error: 128340.
    4141 - val_loss: 207.0762 - val_mean_squared_error:
    88405.3203
Epoch 7/20
24/24 [==============================] - 2s 92ms/
    step - loss: 192.0153 - mean_squared_error: 128347.
    2266 - val_loss: 206.9925 - val_mean_squared_error:
    88366.8672
Epoch 8/20
24/24 [==============================] - 2s 91ms/
```

```
160 step - loss: 192.6268 - mean_squared_error: 128328.
    8594 - val_loss: 207.0265 - val_mean_squared_error:
    88370.5000
161 Epoch 9/20
162 24/24 [==============================] - 2s 92ms/
    step - loss: 190.8434 - mean_squared_error: 128320.
    2969 - val_loss: 207.0592 - val_mean_squared_error:
    88377.8359
163 Epoch 10/20
164 24/24 [==============================] - 2s 90ms/
    step - loss: 188.9368 - mean_squared_error: 128295.
    3672 - val_loss: 207.7205 - val_mean_squared_error:
    88610.5156
165 Epoch 11/20
166 24/24 [==============================] - 2s 95ms/
    step - loss: 190.3792 - mean_squared_error: 128365.
    2500 - val_loss: 206.9700 - val_mean_squared_error:
    88320.2266
167 Epoch 12/20
168 24/24 [==============================] - 2s 92ms/
    step - loss: 190.2775 - mean_squared_error: 128294.
    2266 - val_loss: 206.9413 - val_mean_squared_error:
    88294.2188
169 Epoch 13/20
170 24/24 [==============================] - 2s 94ms/
    step - loss: 191.4604 - mean_squared_error: 128303.
    7188 - val_loss: 206.9504 - val_mean_squared_error:
    88282.1641
171 Epoch 14/20
172 24/24 [==============================] - 2s 98ms/
    step - loss: 191.4715 - mean_squared_error: 128238.
    4766 - val_loss: 207.1283 - val_mean_squared_error:
    88313.9453
173 Epoch 15/20
174 24/24 [==============================] - 2s 90ms/
    step - loss: 190.7896 - mean_squared_error: 128254.
    0000 - val_loss: 206.9243 - val_mean_squared_error:
    88236.9453
175 Epoch 16/20
176 24/24 [==============================] - 2s 94ms/
    step - loss: 186.6461 - mean_squared_error: 128217.
    1094 - val_loss: 207.0295 - val_mean_squared_error:
    88269.4141
177 Epoch 17/20
178 24/24 [==============================] - 2s 96ms/
    step - loss: 189.6171 - mean_squared_error: 128278.
    4688 - val_loss: 207.1325 - val_mean_squared_error:
    88292.7891
```

```
179 Epoch 18/20
180 24/24 [==============================] - 2s 96ms/
    step - loss: 189.0314 - mean_squared_error: 128204.
    2266 - val_loss: 207.5291 - val_mean_squared_error:
    88473.9297
181 Epoch 19/20
182 24/24 [==============================] - 2s 93ms/
    step - loss: 187.9642 - mean_squared_error: 128250.
    6016 - val_loss: 207.1105 - val_mean_squared_error:
    88292.1484
183 Epoch 20/20
184 24/24 [==============================] - 2s 90ms/
    step - loss: 190.2579 - mean_squared_error: 128187.
    6719 - val_loss: 207.0358 - val_mean_squared_error:
    88242.2656
185 Model trained on HOBBIES_1.csv: RMSE=207.0358
186 D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\
    src\engine\training.py:3079: UserWarning: You are
    saving your model as an HDF5 file via `model.save
    ()`. This file format is considered legacy. We
    recommend using instead the native Keras format, e.g
    . `model.save('my_model.keras')`.
187   saving_api.save_model(
188 Model saved as HOBBIES_1_rnn_model.h5
189 Epoch 1/20
190 8/8 [==============================] - 20s 793ms/
    step - loss: 111.8761 - mean_squared_error: 12805.
    3389 - val_loss: 103.0531 - val_mean_squared_error:
    10621.5869
191 Epoch 2/20
192 8/8 [==============================] - 2s 294ms/step
     - loss: 110.6388 - mean_squared_error: 12604.1084
     - val_loss: 102.5887 - val_mean_squared_error:
    10537.3701
193 Epoch 3/20
194 8/8 [==============================] - 2s 307ms/step
     - loss: 108.6489 - mean_squared_error: 12320.3779
     - val_loss: 102.8100 - val_mean_squared_error:
    10585.1494
195 Epoch 4/20
196 8/8 [==============================] - 2s 305ms/step
     - loss: 109.4297 - mean_squared_error: 12293.8643
     - val_loss: 102.9202 - val_mean_squared_error:
    10608.8574
197 Epoch 5/20
198 8/8 [==============================] - 2s 287ms/step
     - loss: 108.4374 - mean_squared_error: 12294.8535
     - val_loss: 102.9175 - val_mean_squared_error:
```

```
198 10608.2744
199 Epoch 6/20
200 8/8 [==============================] - 2s 306ms/step
     - loss: 109.2031 - mean_squared_error: 12298.6416
     - val_loss: 102.8832 - val_mean_squared_error:
    10600.8730
201 Epoch 7/20
202 8/8 [==============================] - 3s 351ms/step
     - loss: 110.3137 - mean_squared_error: 12307.0732
     - val_loss: 102.9086 - val_mean_squared_error:
    10606.3281
203 Epoch 8/20
204 8/8 [==============================] - 3s 325ms/step
     - loss: 108.9337 - mean_squared_error: 12299.0000
     - val_loss: 102.8817 - val_mean_squared_error:
    10600.5166
205 Epoch 9/20
206 8/8 [==============================] - 3s 342ms/step
     - loss: 108.8701 - mean_squared_error: 12300.6631
     - val_loss: 102.8806 - val_mean_squared_error:
    10600.2686
207 Epoch 10/20
208 8/8 [==============================] - 3s 331ms/step
     - loss: 110.4089 - mean_squared_error: 12293.6797
     - val_loss: 102.8723 - val_mean_squared_error:
    10598.4658
209 Epoch 11/20
210 8/8 [==============================] - 2s 308ms/step
     - loss: 109.0071 - mean_squared_error: 12295.4629
     - val_loss: 102.8724 - val_mean_squared_error:
    10598.5039
211 Epoch 12/20
212 8/8 [==============================] - 3s 399ms/step
     - loss: 110.0896 - mean_squared_error: 12296.8682
     - val_loss: 102.8614 - val_mean_squared_error:
    10596.1230
213 Epoch 13/20
214 8/8 [==============================] - 3s 385ms/step
     - loss: 108.8883 - mean_squared_error: 12293.8467
     - val_loss: 102.8797 - val_mean_squared_error:
    10600.0645
215 Epoch 14/20
216 8/8 [==============================] - 3s 433ms/step
     - loss: 109.3433 - mean_squared_error: 12300.0527
     - val_loss: 102.8369 - val_mean_squared_error:
    10590.8350
217 Epoch 15/20
218 8/8 [==============================] - 4s 467ms/step
```

```
218  - loss: 108.4045 - mean_squared_error: 12296.9775
     - val_loss: 102.8077 - val_mean_squared_error:
    10584.5176
219 Epoch 16/20
220 8/8 [==============================] - 3s 423ms/step
     - loss: 108.7639 - mean_squared_error: 12297.3184
     - val_loss: 102.8084 - val_mean_squared_error:
    10584.6680
221 Epoch 17/20
222 8/8 [==============================] - 2s 297ms/step
     - loss: 109.5576 - mean_squared_error: 12296.5479
     - val_loss: 102.7839 - val_mean_squared_error:
    10579.3594
223 Epoch 18/20
224 8/8 [==============================] - 2s 289ms/step
     - loss: 109.3789 - mean_squared_error: 12295.9570
     - val_loss: 102.7854 - val_mean_squared_error:
    10579.7012
225 Epoch 19/20
226 8/8 [==============================] - 2s 286ms/step
     - loss: 109.4777 - mean_squared_error: 12296.5537
     - val_loss: 102.7912 - val_mean_squared_error:
    10580.9521
227 Epoch 20/20
228 8/8 [==============================] - 2s 277ms/step
     - loss: 108.6037 - mean_squared_error: 12297.1182
     - val_loss: 102.7957 - val_mean_squared_error:
    10581.9248
229 Model trained on HOBBIES_2.csv: RMSE=102.7957
230 D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\
    src\engine\training.py:3079: UserWarning: You are
    saving your model as an HDF5 file via `model.save
    ()`. This file format is considered legacy. We
    recommend using instead the native Keras format, e.g
    . `model.save('my_model.keras')`.
231   saving_api.save_model(
232 Model saved as HOBBIES_2_rnn_model.h5
233 Epoch 1/20
234 27/27 [==============================] - 22s 316ms/
    step - loss: 128.5309 - mean_squared_error: 23314.
    9336 - val_loss: 103.1336 - val_mean_squared_error:
    10867.0859
235 Epoch 2/20
236 27/27 [==============================] - 5s 190ms/
    step - loss: 133.2332 - mean_squared_error: 22888.
    0898 - val_loss: 103.1119 - val_mean_squared_error:
    10862.2148
237 Epoch 3/20
```

```
238 27/27 [==============================] - 5s 189ms/
    step - loss: 130.3015 - mean_squared_error: 22892.
    5000 - val_loss: 103.1429 - val_mean_squared_error:
    10869.0156
239 Epoch 4/20
240 27/27 [==============================] - 5s 193ms/
    step - loss: 132.9321 - mean_squared_error: 22895.
    0371 - val_loss: 103.1207 - val_mean_squared_error:
    10864.3018
241 Epoch 5/20
242 27/27 [==============================] - 5s 188ms/
    step - loss: 132.8214 - mean_squared_error: 22897.
    6621 - val_loss: 103.0312 - val_mean_squared_error:
    10844.2021
243 Epoch 6/20
244 27/27 [==============================] - 5s 189ms/
    step - loss: 132.1008 - mean_squared_error: 22890.
    8887 - val_loss: 103.0372 - val_mean_squared_error:
    10845.5713
245 Epoch 7/20
246 27/27 [==============================] - 5s 191ms/
    step - loss: 131.3307 - mean_squared_error: 22886.
    7129 - val_loss: 103.0437 - val_mean_squared_error:
    10847.0586
247 Epoch 8/20
248 27/27 [==============================] - 5s 195ms/
    step - loss: 132.7452 - mean_squared_error: 22888.
    4082 - val_loss: 103.0564 - val_mean_squared_error:
    10849.9131
249 Epoch 9/20
250 27/27 [==============================] - 5s 189ms/
    step - loss: 133.6065 - mean_squared_error: 22886.
    4551 - val_loss: 103.0296 - val_mean_squared_error:
    10843.8916
251 Epoch 10/20
252 27/27 [==============================] - 5s 189ms/
    step - loss: 133.0835 - mean_squared_error: 22879.
    7363 - val_loss: 103.0405 - val_mean_squared_error:
    10846.3545
253 Epoch 11/20
254 27/27 [==============================] - 5s 186ms/
    step - loss: 131.6170 - mean_squared_error: 22890.
    3652 - val_loss: 103.0914 - val_mean_squared_error:
    10857.7832
255 Epoch 12/20
256 27/27 [==============================] - 5s 186ms/
    step - loss: 131.3619 - mean_squared_error: 22893.
    6445 - val_loss: 103.0761 - val_mean_squared_error:
```

```
256 10854.3652
257 Epoch 13/20
258 27/27 [==============================] - 5s 198ms/
    step - loss: 132.0525 - mean_squared_error: 22891.
    7402 - val_loss: 103.1078 - val_mean_squared_error:
    10861.4580
259 Epoch 14/20
260 27/27 [==============================] - 5s 204ms/
    step - loss: 130.6382 - mean_squared_error: 22894.
    8496 - val_loss: 103.1242 - val_mean_squared_error:
    10865.1260
261 Epoch 15/20
262 27/27 [==============================] - 5s 192ms/
    step - loss: 130.9447 - mean_squared_error: 22898.
    1328 - val_loss: 103.1369 - val_mean_squared_error:
    10867.9648
263 Epoch 16/20
264 27/27 [==============================] - 5s 191ms/
    step - loss: 129.1647 - mean_squared_error: 22907.
    5293 - val_loss: 103.1421 - val_mean_squared_error:
    10869.0996
265 Epoch 17/20
266 27/27 [==============================] - 5s 199ms/
    step - loss: 132.2469 - mean_squared_error: 22899.
    4551 - val_loss: 103.1326 - val_mean_squared_error:
    10866.9961
267 Epoch 18/20
268 27/27 [==============================] - 5s 194ms/
    step - loss: 134.2065 - mean_squared_error: 22897.
    7461 - val_loss: 103.0819 - val_mean_squared_error:
    10855.6875
269 Epoch 19/20
270 27/27 [==============================] - 5s 202ms/
    step - loss: 130.9922 - mean_squared_error: 22896.
    9648 - val_loss: 103.0711 - val_mean_squared_error:
    10853.2891
271 Epoch 20/20
272 27/27 [==============================] - 5s 194ms/
    step - loss: 132.5766 - mean_squared_error: 22892.
    1172 - val_loss: 103.0268 - val_mean_squared_error:
    10843.3086
273 Model trained on HOUSEHOLD_1.csv: RMSE=103.0268
274 D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\
    src\engine\training.py:3079: UserWarning: You are
    saving your model as an HDF5 file via `model.save
    ()`. This file format is considered legacy. We
    recommend using instead the native Keras format, e.g
    . `model.save('my_model.keras')`.
```

```
275   saving_api.save_model(
276 Model saved as HOUSEHOLD_1_rnn_model.h5
277 Epoch 1/20
278 24/24 [==============================] - 22s 320ms/
    step - loss: 119.7750 - mean_squared_error: 15157.
    0850 - val_loss: 101.9306 - val_mean_squared_error:
    10686.3027
279 Epoch 2/20
280 24/24 [==============================] - 5s 197ms/
    step - loss: 117.2518 - mean_squared_error: 14837.
    4658 - val_loss: 101.8767 - val_mean_squared_error:
    10674.3018
281 Epoch 3/20
282 24/24 [==============================] - 5s 205ms/
    step - loss: 118.1266 - mean_squared_error: 14837.
    0420 - val_loss: 101.8830 - val_mean_squared_error:
    10675.4053
283 Epoch 4/20
284 24/24 [==============================] - 5s 200ms/
    step - loss: 117.6611 - mean_squared_error: 14830.
    1904 - val_loss: 101.9085 - val_mean_squared_error:
    10681.4941
285 Epoch 5/20
286 24/24 [==============================] - 5s 200ms/
    step - loss: 117.0796 - mean_squared_error: 14823.
    6514 - val_loss: 101.9049 - val_mean_squared_error:
    10680.4873
287 Epoch 6/20
288 24/24 [==============================] - 5s 200ms/
    step - loss: 116.5704 - mean_squared_error: 14825.
    4092 - val_loss: 101.9127 - val_mean_squared_error:
    10682.2500
289 Epoch 7/20
290 24/24 [==============================] - 6s 252ms/
    step - loss: 116.8504 - mean_squared_error: 14825.
    1445 - val_loss: 101.9331 - val_mean_squared_error:
    10686.6494
291 Epoch 8/20
292 24/24 [==============================] - 6s 240ms/
    step - loss: 116.9785 - mean_squared_error: 14831.
    2334 - val_loss: 102.0270 - val_mean_squared_error:
    10707.4854
293 Epoch 9/20
294 24/24 [==============================] - 5s 220ms/
    step - loss: 117.3555 - mean_squared_error: 14821.
    9385 - val_loss: 102.0950 - val_mean_squared_error:
    10722.2314
295 Epoch 10/20
```

```
296 24/24 [==============================] - 5s 191ms/
    step - loss: 116.9636 - mean_squared_error: 14821.
    9785 - val_loss: 101.9339 - val_mean_squared_error:
    10686.6572
297 Epoch 11/20
298 24/24 [==============================] - 6s 262ms/
    step - loss: 116.4657 - mean_squared_error: 14822.
    9463 - val_loss: 101.9716 - val_mean_squared_error:
    10695.2646
299 Epoch 12/20
300 24/24 [==============================] - 7s 279ms/
    step - loss: 118.0506 - mean_squared_error: 14826.
    3525 - val_loss: 102.0740 - val_mean_squared_error:
    10717.5723
301 Epoch 13/20
302 24/24 [==============================] - 5s 227ms/
    step - loss: 116.7805 - mean_squared_error: 14834.
    1025 - val_loss: 102.0838 - val_mean_squared_error:
    10720.2988
303 Epoch 14/20
304 24/24 [==============================] - 6s 257ms/
    step - loss: 117.1200 - mean_squared_error: 14827.
    5791 - val_loss: 102.0270 - val_mean_squared_error:
    10707.6279
305 Epoch 15/20
306 24/24 [==============================] - 7s 290ms/
    step - loss: 117.7277 - mean_squared_error: 14823.
    9668 - val_loss: 101.9826 - val_mean_squared_error:
    10697.0586
307 Epoch 16/20
308 24/24 [==============================] - 6s 266ms/
    step - loss: 116.6194 - mean_squared_error: 14825.
    6006 - val_loss: 102.1025 - val_mean_squared_error:
    10723.7471
309 Epoch 17/20
310 24/24 [==============================] - 7s 309ms/
    step - loss: 119.1173 - mean_squared_error: 14829.
    8398 - val_loss: 102.0927 - val_mean_squared_error:
    10721.1260
311 Epoch 18/20
312 24/24 [==============================] - 7s 272ms/
    step - loss: 116.6288 - mean_squared_error: 14819.
    5068 - val_loss: 102.0879 - val_mean_squared_error:
    10720.4395
313 Epoch 19/20
314 24/24 [==============================] - 6s 246ms/
    step - loss: 117.1012 - mean_squared_error: 14814.
    6074 - val_loss: 102.0942 - val_mean_squared_error:
```

```
10720.8887
Epoch 20/20
24/24 [==============================] - 6s 250ms/step - loss: 116.9762 - mean_squared_error: 14823.7021 - val_loss: 101.9195 - val_mean_squared_error: 10683.1084
Model trained on HOUSEHOLD_2.csv: RMSE=101.9195
D:\anaconda3\envs\tf2_cpu\lib\site-packages\keras\src\engine\training.py:3079: UserWarning: You are saving your model as an HDF5 file via `model.save()`. This file format is considered legacy. We recommend using instead the native Keras format, e.g. `model.save('my_model.keras')`.
  saving_api.save_model(
Model saved as HOUSEHOLD_2_rnn_model.h5

```