

In [1]:

```
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#  
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# limitations under the License.
```

In [2]:

```
!pip install tf-nightly-2.0-preview
```

```
ERROR: Could not find a version that satisfies the requirement tf-nightly-2.0-preview (from versio  
ns: none)  
ERROR: No matching distribution found for tf-nightly-2.0-preview
```

In [3]:

```
import tensorflow as tf  
import numpy as np  
import matplotlib.pyplot as plt  
print(tf.__version__)
```

2.3.0

In [4]:

```
def plot_series(time, series, format="-", start=0, end=None):  
    plt.plot(time[start:end], series[start:end], format)  
    plt.xlabel("Time")  
    plt.ylabel("Value")  
    plt.grid(False)  
  
def trend(time, slope=0):  
    return slope * time  
  
def seasonal_pattern(season_time):  
    """Just an arbitrary pattern, you can change it if you wish"""  
    return np.where(season_time < 0.1,  
                    np.cos(season_time * 6 * np.pi),  
                    2 / np.exp(9 * season_time))  
  
def seasonality(time, period, amplitude=1, phase=0):  
    """Repeats the same pattern at each period"""  
    season_time = ((time + phase) % period) / period  
    return amplitude * seasonal_pattern(season_time)  
  
def noise(time, noise_level=1, seed=None):  
    rnd = np.random.RandomState(seed)  
    return rnd.randn(len(time)) * noise_level  
  
time = np.arange(10 * 365 + 1, dtype="float32")  
baseline = 10  
series = trend(time, 0.1)  
baseline = 10  
amplitude = 40  
slope = 0.005  
noise_level = 3  
  
# Create the series  
series = baseline + trend(time, slope) + seasonality(time, period=365, amplitude=amplitude)  
# Update with noise  
series += noise(time, noise_level, seed=51)
```

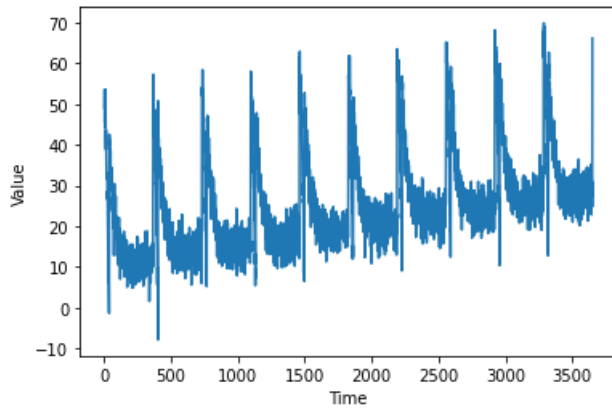
```

split_time = 3000
time_train = time[:split_time]
x_train = series[:split_time]
time_valid = time[split_time:]
x_valid = series[split_time:]

window_size = 20
batch_size = 32
shuffle_buffer_size = 1000

plot_series(time, series)

```



In [5]:

```

def windowed_dataset(series, window_size, batch_size, shuffle_buffer):
    dataset = tf.data.Dataset.from_tensor_slices(series)
    dataset = dataset.window(window_size + 1, shift=1, drop_remainder=True)
    dataset = dataset.flat_map(lambda window: window.batch(window_size + 1))
    dataset = dataset.shuffle(shuffle_buffer).map(lambda window: (window[:-1], window[-1]))
    dataset = dataset.batch(batch_size).prefetch(1)
    return dataset

```

In [6]:

```

tf.keras.backend.clear_session()
tf.random.set_seed(51)
np.random.seed(51)

tf.keras.backend.clear_session()
dataset = windowed_dataset(x_train, window_size, batch_size, shuffle_buffer_size)

model = tf.keras.models.Sequential([
    tf.keras.layers.Lambda(lambda x: tf.expand_dims(x, axis=-1),
                           input_shape=[None]),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(32, return_sequences=True)),
    tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(32)),
    tf.keras.layers.Dense(1),
    tf.keras.layers.Lambda(lambda x: x * 10.0)
])

lr_schedule = tf.keras.callbacks.LearningRateScheduler(
    lambda epoch: 1e-8 * 10**(epoch / 20))
optimizer = tf.keras.optimizers.SGD(lr=1e-8, momentum=0.9)
model.compile(loss=tf.keras.losses.Huber(),
              optimizer=optimizer,
              metrics=["mae"])
history = model.fit(dataset, epochs=100, callbacks=[lr_schedule])

```

```

Epoch 1/100
94/94 [=====] - 1s 11ms/step - loss: 20.3828 - mae: 20.8828
Epoch 2/100
94/94 [=====] - 1s 11ms/step - loss: 20.3543 - mae: 20.8543
Epoch 3/100
94/94 [=====] - 1s 11ms/step - loss: 20.3218 - mae: 20.8218
Epoch 4/100
94/94 [=====] - 1s 10ms/step - loss: 20.2852 - mae: 20.7851
Epoch 5/100

```

```
94/94 [=====] - 1s 11ms/step - loss: 20.2436 - mae: 20.7436
Epoch 6/100
94/94 [=====] - 1s 11ms/step - loss: 20.1964 - mae: 20.6964
Epoch 7/100
94/94 [=====] - 1s 10ms/step - loss: 20.1429 - mae: 20.6429
Epoch 8/100
94/94 [=====] - 1s 11ms/step - loss: 20.0823 - mae: 20.5823
Epoch 9/100
94/94 [=====] - 1s 11ms/step - loss: 20.0140 - mae: 20.5140
Epoch 10/100
94/94 [=====] - 1s 11ms/step - loss: 19.9385 - mae: 20.4385
Epoch 11/100
94/94 [=====] - 1s 11ms/step - loss: 19.8585 - mae: 20.3585
Epoch 12/100
94/94 [=====] - 1s 11ms/step - loss: 19.7777 - mae: 20.2777
Epoch 13/100
94/94 [=====] - 1s 10ms/step - loss: 19.6968 - mae: 20.1968
Epoch 14/100
94/94 [=====] - 1s 10ms/step - loss: 19.6109 - mae: 20.1109
Epoch 15/100
94/94 [=====] - 1s 10ms/step - loss: 19.5163 - mae: 20.0163
Epoch 16/100
94/94 [=====] - 1s 11ms/step - loss: 19.4109 - mae: 19.9109
Epoch 17/100
94/94 [=====] - 1s 11ms/step - loss: 19.2932 - mae: 19.7932
Epoch 18/100
94/94 [=====] - 1s 11ms/step - loss: 19.1618 - mae: 19.6618
Epoch 19/100
94/94 [=====] - 1s 11ms/step - loss: 19.0149 - mae: 19.5148
Epoch 20/100
94/94 [=====] - 1s 11ms/step - loss: 18.8504 - mae: 19.3502
Epoch 21/100
94/94 [=====] - 1s 11ms/step - loss: 18.6658 - mae: 19.1656
Epoch 22/100
94/94 [=====] - 1s 11ms/step - loss: 18.4587 - mae: 18.9583
Epoch 23/100
94/94 [=====] - 1s 11ms/step - loss: 18.2256 - mae: 18.7249
Epoch 24/100
94/94 [=====] - 1s 11ms/step - loss: 17.9631 - mae: 18.4621
Epoch 25/100
94/94 [=====] - 1s 11ms/step - loss: 17.6667 - mae: 18.1655
Epoch 26/100
94/94 [=====] - 1s 11ms/step - loss: 17.3323 - mae: 17.8312
Epoch 27/100
94/94 [=====] - 1s 11ms/step - loss: 16.9562 - mae: 17.4554
Epoch 28/100
94/94 [=====] - 1s 11ms/step - loss: 16.5359 - mae: 17.0350
Epoch 29/100
94/94 [=====] - 1s 11ms/step - loss: 16.0721 - mae: 16.5714
Epoch 30/100
94/94 [=====] - 1s 11ms/step - loss: 15.5645 - mae: 16.0630
Epoch 31/100
94/94 [=====] - 1s 11ms/step - loss: 15.0131 - mae: 15.5113
Epoch 32/100
94/94 [=====] - 1s 11ms/step - loss: 14.4169 - mae: 14.9140
Epoch 33/100
94/94 [=====] - 1s 11ms/step - loss: 13.7764 - mae: 14.2730
Epoch 34/100
94/94 [=====] - 1s 11ms/step - loss: 13.0955 - mae: 13.5900
Epoch 35/100
94/94 [=====] - 1s 11ms/step - loss: 12.3846 - mae: 12.8770
Epoch 36/100
94/94 [=====] - 1s 11ms/step - loss: 11.6591 - mae: 12.1503
Epoch 37/100
94/94 [=====] - 1s 11ms/step - loss: 10.9345 - mae: 11.4246
Epoch 38/100
94/94 [=====] - 1s 11ms/step - loss: 10.2310 - mae: 10.7178
Epoch 39/100
94/94 [=====] - 1s 11ms/step - loss: 9.5739 - mae: 10.0572
Epoch 40/100
94/94 [=====] - 1s 11ms/step - loss: 8.9922 - mae: 9.4767
Epoch 41/100
94/94 [=====] - 1s 11ms/step - loss: 8.4929 - mae: 8.9762
Epoch 42/100
94/94 [=====] - 1s 10ms/step - loss: 8.0732 - mae: 8.5559
Epoch 43/100
94/94 [=====] - 1s 10ms/step - loss: 7.7375 - mae: 8.2186
```

```
Epoch 44/100
94/94 [=====] - 1s 11ms/step - loss: 7.4800 - mae: 7.9611
Epoch 45/100
94/94 [=====] - 1s 11ms/step - loss: 7.2799 - mae: 7.7611
Epoch 46/100
94/94 [=====] - 1s 11ms/step - loss: 7.1259 - mae: 7.6089
Epoch 47/100
94/94 [=====] - 1s 11ms/step - loss: 6.9972 - mae: 7.4794
Epoch 48/100
94/94 [=====] - 1s 11ms/step - loss: 6.8882 - mae: 7.3684
Epoch 49/100
94/94 [=====] - 1s 11ms/step - loss: 6.7790 - mae: 7.2586
Epoch 50/100
94/94 [=====] - 1s 11ms/step - loss: 6.6710 - mae: 7.1513
Epoch 51/100
94/94 [=====] - 1s 11ms/step - loss: 6.5490 - mae: 7.0292
Epoch 52/100
94/94 [=====] - 1s 11ms/step - loss: 6.3435 - mae: 6.8203
Epoch 53/100
94/94 [=====] - 1s 11ms/step - loss: 5.9019 - mae: 6.3736
Epoch 54/100
94/94 [=====] - 1s 11ms/step - loss: 5.6925 - mae: 6.1635
Epoch 55/100
94/94 [=====] - 1s 11ms/step - loss: 5.5132 - mae: 5.9845
Epoch 56/100
94/94 [=====] - 1s 11ms/step - loss: 5.3014 - mae: 5.7677
Epoch 57/100
94/94 [=====] - 1s 11ms/step - loss: 5.1778 - mae: 5.6485
Epoch 58/100
94/94 [=====] - 1s 11ms/step - loss: 5.0339 - mae: 5.5024
Epoch 59/100
94/94 [=====] - 1s 11ms/step - loss: 4.8640 - mae: 5.3295
Epoch 60/100
94/94 [=====] - 1s 11ms/step - loss: 4.7670 - mae: 5.2320
Epoch 61/100
94/94 [=====] - 1s 11ms/step - loss: 4.6816 - mae: 5.1469
Epoch 62/100
94/94 [=====] - 1s 11ms/step - loss: 4.5836 - mae: 5.0500
Epoch 63/100
94/94 [=====] - 1s 11ms/step - loss: 4.5919 - mae: 5.0578
Epoch 64/100
94/94 [=====] - 1s 11ms/step - loss: 4.5364 - mae: 5.0037
Epoch 65/100
94/94 [=====] - 1s 11ms/step - loss: 4.5465 - mae: 5.0131
Epoch 66/100
94/94 [=====] - 1s 11ms/step - loss: 4.3607 - mae: 4.8270
Epoch 67/100
94/94 [=====] - 1s 11ms/step - loss: 4.1550 - mae: 4.6184
Epoch 68/100
94/94 [=====] - 1s 11ms/step - loss: 4.0570 - mae: 4.5204
Epoch 69/100
94/94 [=====] - 1s 11ms/step - loss: 4.1300 - mae: 4.5964
Epoch 70/100
94/94 [=====] - 1s 11ms/step - loss: 3.9866 - mae: 4.4504
Epoch 71/100
94/94 [=====] - 1s 11ms/step - loss: 3.8718 - mae: 4.3380
Epoch 72/100
94/94 [=====] - 1s 11ms/step - loss: 3.8384 - mae: 4.3019
Epoch 73/100
94/94 [=====] - 1s 11ms/step - loss: 3.8492 - mae: 4.3135
Epoch 74/100
94/94 [=====] - 1s 11ms/step - loss: 3.6988 - mae: 4.1621
Epoch 75/100
94/94 [=====] - 1s 11ms/step - loss: 3.6401 - mae: 4.1042
Epoch 76/100
94/94 [=====] - 1s 11ms/step - loss: 3.5737 - mae: 4.0365
Epoch 77/100
94/94 [=====] - 1s 11ms/step - loss: 3.4824 - mae: 3.9487
Epoch 78/100
94/94 [=====] - 1s 11ms/step - loss: 3.3948 - mae: 3.8627
Epoch 79/100
94/94 [=====] - 1s 11ms/step - loss: 3.2423 - mae: 3.7046
Epoch 80/100
94/94 [=====] - 1s 11ms/step - loss: 3.3036 - mae: 3.7695
Epoch 81/100
94/94 [=====] - 1s 11ms/step - loss: 3.0867 - mae: 3.5510
Epoch 82/100
```

```

94/94 [=====] - 1s 11ms/step - loss: 3.0346 - mae: 3.4997
Epoch 83/100
94/94 [=====] - 1s 11ms/step - loss: 3.0818 - mae: 3.5462
Epoch 84/100
94/94 [=====] - 1s 11ms/step - loss: 3.0555 - mae: 3.5182
Epoch 85/100
94/94 [=====] - 1s 11ms/step - loss: 3.0529 - mae: 3.5142
Epoch 86/100
94/94 [=====] - 1s 11ms/step - loss: 3.0089 - mae: 3.4709
Epoch 87/100
94/94 [=====] - 1s 11ms/step - loss: 3.0378 - mae: 3.5031
Epoch 88/100
94/94 [=====] - 1s 11ms/step - loss: 2.9082 - mae: 3.3734
Epoch 89/100
94/94 [=====] - 1s 11ms/step - loss: 3.1926 - mae: 3.6618
Epoch 90/100
94/94 [=====] - 1s 11ms/step - loss: 3.2377 - mae: 3.7054
Epoch 91/100
94/94 [=====] - 1s 11ms/step - loss: 2.9589 - mae: 3.4237
Epoch 92/100
94/94 [=====] - 1s 11ms/step - loss: 3.0998 - mae: 3.5658
Epoch 93/100
94/94 [=====] - 1s 11ms/step - loss: 2.9112 - mae: 3.3756
Epoch 94/100
94/94 [=====] - 1s 11ms/step - loss: 2.9083 - mae: 3.3719
Epoch 95/100
94/94 [=====] - 1s 11ms/step - loss: 2.9167 - mae: 3.3794
Epoch 96/100
94/94 [=====] - 1s 12ms/step - loss: 2.9513 - mae: 3.4192
Epoch 97/100
94/94 [=====] - 1s 12ms/step - loss: 2.8930 - mae: 3.3590
Epoch 98/100
94/94 [=====] - 1s 11ms/step - loss: 2.8878 - mae: 3.3532
Epoch 99/100
94/94 [=====] - 1s 11ms/step - loss: 2.9151 - mae: 3.3793
Epoch 100/100
94/94 [=====] - 1s 11ms/step - loss: 3.3328 - mae: 3.8012

```

In [7]:

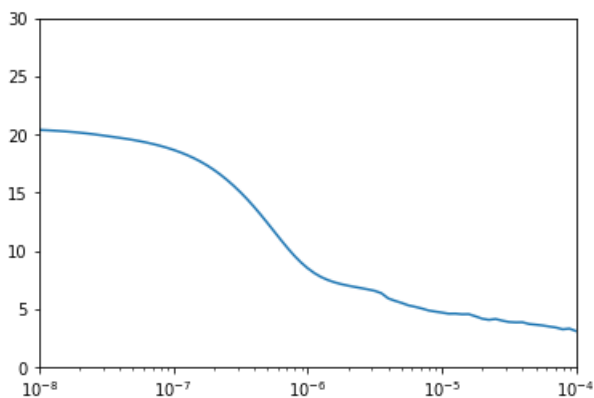
```

plt.semilogx(history.history["lr"], history.history["loss"])
plt.axis([1e-8, 1e-4, 0, 30])

```

Out[7]:

(1e-08, 0.0001, 0.0, 30.0)



In [8]:

```

tf.keras.backend.clear_session()
tf.random.set_seed(51)
np.random.seed(51)

tf.keras.backend.clear_session()
dataset = windowed_dataset(x_train, window_size, batch_size, shuffle_buffer_size)

model = tf.keras.models.Sequential([
    tf.keras.layers.Lambda(lambda x: tf.expand_dims(x, axis=-1),

```

```

        input_shape=[None]),
        tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(32, return_sequences=True)),
        tf.keras.layers.Bidirectional(tf.keras.layers.LSTM(32)),
        tf.keras.layers.Dense(1),
        tf.keras.layers.Lambda(lambda x: x * 100.0)
    ])

model.compile(loss="mse", optimizer=tf.keras.optimizers.SGD(lr=1e-5, momentum=0.9), metrics=["mae"])
history = model.fit(dataset, epochs=500, verbose=1)

```

```

Epoch 1/500
94/94 [=====] - 1s 11ms/step - loss: 263.1988 - mae: 10.1378
Epoch 2/500
94/94 [=====] - 1s 10ms/step - loss: 33.6153 - mae: 3.9017
Epoch 3/500
94/94 [=====] - 1s 10ms/step - loss: 27.7103 - mae: 3.5518
Epoch 4/500
94/94 [=====] - 1s 10ms/step - loss: 31.9160 - mae: 3.9759
Epoch 5/500
94/94 [=====] - 1s 10ms/step - loss: 27.1127 - mae: 3.5515
Epoch 6/500
94/94 [=====] - 1s 10ms/step - loss: 25.7764 - mae: 3.4461
Epoch 7/500
94/94 [=====] - 1s 10ms/step - loss: 32.1397 - mae: 3.9959
Epoch 8/500
94/94 [=====] - 1s 11ms/step - loss: 27.8369 - mae: 3.6121
Epoch 9/500
94/94 [=====] - 1s 11ms/step - loss: 29.2938 - mae: 3.8187
Epoch 10/500
94/94 [=====] - 1s 11ms/step - loss: 28.0733 - mae: 3.6757
Epoch 11/500
94/94 [=====] - 1s 10ms/step - loss: 27.6546 - mae: 3.6672
Epoch 12/500
94/94 [=====] - 1s 10ms/step - loss: 25.2645 - mae: 3.4160
Epoch 13/500
94/94 [=====] - 1s 11ms/step - loss: 28.1417 - mae: 3.7027
Epoch 14/500
94/94 [=====] - 1s 10ms/step - loss: 26.9170 - mae: 3.5711
Epoch 15/500
94/94 [=====] - 1s 11ms/step - loss: 25.8985 - mae: 3.4787
Epoch 16/500
94/94 [=====] - 1s 11ms/step - loss: 29.4808 - mae: 3.8158
Epoch 17/500
94/94 [=====] - 1s 11ms/step - loss: 24.2143 - mae: 3.3191
Epoch 18/500
94/94 [=====] - 1s 11ms/step - loss: 26.4903 - mae: 3.5473
Epoch 19/500
94/94 [=====] - 1s 11ms/step - loss: 25.5329 - mae: 3.4825
Epoch 20/500
94/94 [=====] - 1s 10ms/step - loss: 25.1893 - mae: 3.4211
Epoch 21/500
94/94 [=====] - 1s 11ms/step - loss: 27.1048 - mae: 3.5829
Epoch 22/500
94/94 [=====] - 1s 11ms/step - loss: 24.7341 - mae: 3.3448
Epoch 23/500
94/94 [=====] - 1s 11ms/step - loss: 28.0723 - mae: 3.7013
Epoch 24/500
94/94 [=====] - 1s 11ms/step - loss: 25.0951 - mae: 3.4339
Epoch 25/500
94/94 [=====] - 1s 11ms/step - loss: 24.3323 - mae: 3.3488
Epoch 26/500
94/94 [=====] - 1s 11ms/step - loss: 25.9359 - mae: 3.5183
Epoch 27/500
94/94 [=====] - 1s 11ms/step - loss: 29.6889 - mae: 3.7865
Epoch 28/500
94/94 [=====] - 1s 11ms/step - loss: 27.8246 - mae: 3.7044
Epoch 29/500
94/94 [=====] - 1s 11ms/step - loss: 23.8184 - mae: 3.3226
Epoch 30/500
94/94 [=====] - 1s 11ms/step - loss: 23.6580 - mae: 3.2755
Epoch 31/500
94/94 [=====] - 1s 11ms/step - loss: 24.8964 - mae: 3.3859
Epoch 32/500
94/94 [=====] - 1s 11ms/step - loss: 27.2025 - mae: 3.7034
Epoch 33/500
94/94 [=====] - 1s 11ms/step - loss: 24.5020 - mae: 3.2002

```

```
94/94 [=====] - 1s 11ms/step - loss: 24.5959 - mae: 3.5903
Epoch 34/500
94/94 [=====] - 1s 10ms/step - loss: 26.9419 - mae: 3.6388
Epoch 35/500
94/94 [=====] - 1s 11ms/step - loss: 24.2124 - mae: 3.3517
Epoch 36/500
94/94 [=====] - 1s 11ms/step - loss: 26.1243 - mae: 3.5010
Epoch 37/500
94/94 [=====] - 1s 11ms/step - loss: 24.2108 - mae: 3.3698
Epoch 38/500
94/94 [=====] - 1s 11ms/step - loss: 25.1751 - mae: 3.4867
Epoch 39/500
94/94 [=====] - 1s 11ms/step - loss: 29.6484 - mae: 3.8720
Epoch 40/500
94/94 [=====] - 1s 11ms/step - loss: 27.6396 - mae: 3.6383
Epoch 41/500
94/94 [=====] - 1s 11ms/step - loss: 24.8158 - mae: 3.4319
Epoch 42/500
94/94 [=====] - 1s 11ms/step - loss: 24.1857 - mae: 3.3383
Epoch 43/500
94/94 [=====] - 1s 11ms/step - loss: 25.2320 - mae: 3.4564
Epoch 44/500
94/94 [=====] - 1s 11ms/step - loss: 22.7423 - mae: 3.2177
Epoch 45/500
94/94 [=====] - 1s 11ms/step - loss: 26.1130 - mae: 3.5584
Epoch 46/500
94/94 [=====] - 1s 10ms/step - loss: 26.3003 - mae: 3.5451
Epoch 47/500
94/94 [=====] - 1s 11ms/step - loss: 27.1847 - mae: 3.6459
Epoch 48/500
94/94 [=====] - 1s 11ms/step - loss: 25.0236 - mae: 3.4406
Epoch 49/500
94/94 [=====] - 1s 10ms/step - loss: 24.7453 - mae: 3.4041
Epoch 50/500
94/94 [=====] - 1s 11ms/step - loss: 24.1683 - mae: 3.3799
Epoch 51/500
94/94 [=====] - 1s 11ms/step - loss: 23.7089 - mae: 3.2937
Epoch 52/500
94/94 [=====] - 1s 11ms/step - loss: 26.3819 - mae: 3.5666
Epoch 53/500
94/94 [=====] - 1s 11ms/step - loss: 24.5370 - mae: 3.3710
Epoch 54/500
94/94 [=====] - 1s 11ms/step - loss: 23.6158 - mae: 3.2934
Epoch 55/500
94/94 [=====] - 1s 11ms/step - loss: 23.2196 - mae: 3.2379
Epoch 56/500
94/94 [=====] - 1s 11ms/step - loss: 23.8406 - mae: 3.3371
Epoch 57/500
94/94 [=====] - 1s 11ms/step - loss: 23.9306 - mae: 3.3308
Epoch 58/500
94/94 [=====] - 1s 11ms/step - loss: 24.5186 - mae: 3.4204
Epoch 59/500
94/94 [=====] - 1s 11ms/step - loss: 23.6876 - mae: 3.3415
Epoch 60/500
94/94 [=====] - 1s 11ms/step - loss: 23.6655 - mae: 3.2789
Epoch 61/500
94/94 [=====] - 1s 11ms/step - loss: 24.8515 - mae: 3.4363
Epoch 62/500
94/94 [=====] - 1s 11ms/step - loss: 23.4737 - mae: 3.3026
Epoch 63/500
94/94 [=====] - 1s 11ms/step - loss: 23.9637 - mae: 3.3240
Epoch 64/500
94/94 [=====] - 1s 11ms/step - loss: 24.0891 - mae: 3.3732
Epoch 65/500
94/94 [=====] - 1s 11ms/step - loss: 23.1289 - mae: 3.2762
Epoch 66/500
94/94 [=====] - 1s 11ms/step - loss: 25.2905 - mae: 3.4505
Epoch 67/500
94/94 [=====] - 1s 11ms/step - loss: 22.6900 - mae: 3.2022
Epoch 68/500
94/94 [=====] - 1s 11ms/step - loss: 23.4361 - mae: 3.2604
Epoch 69/500
94/94 [=====] - 1s 11ms/step - loss: 24.3627 - mae: 3.4066
Epoch 70/500
94/94 [=====] - 1s 11ms/step - loss: 22.6785 - mae: 3.2219
Epoch 71/500
94/94 [=====] - 1s 11ms/step - loss: 22.8470 - mae: 3.2379
Epoch 72/500
```

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Epoch 72/500
94/94 [=====] - 1s 11ms/step - loss: 22.8695 - mae: 3.2511
Epoch 73/500
94/94 [=====] - 1s 11ms/step - loss: 23.5616 - mae: 3.3078
Epoch 74/500
94/94 [=====] - 1s 11ms/step - loss: 23.4071 - mae: 3.2647
Epoch 75/500
94/94 [=====] - 1s 11ms/step - loss: 23.5623 - mae: 3.3068
Epoch 76/500
94/94 [=====] - 1s 11ms/step - loss: 23.1138 - mae: 3.2700
Epoch 77/500
94/94 [=====] - 1s 10ms/step - loss: 24.1217 - mae: 3.3795
Epoch 78/500
94/94 [=====] - 1s 11ms/step - loss: 21.9296 - mae: 3.1299
Epoch 79/500
94/94 [=====] - 1s 11ms/step - loss: 22.5547 - mae: 3.1946
Epoch 80/500
94/94 [=====] - 1s 11ms/step - loss: 22.8248 - mae: 3.2368
Epoch 81/500
94/94 [=====] - 1s 11ms/step - loss: 23.3678 - mae: 3.2895
Epoch 82/500
94/94 [=====] - 1s 11ms/step - loss: 23.6419 - mae: 3.3587
Epoch 83/500
94/94 [=====] - 1s 11ms/step - loss: 24.2519 - mae: 3.4740
Epoch 84/500
94/94 [=====] - 1s 10ms/step - loss: 22.8469 - mae: 3.2698
Epoch 85/500
94/94 [=====] - 1s 10ms/step - loss: 21.5177 - mae: 3.1069
Epoch 86/500
94/94 [=====] - 1s 11ms/step - loss: 22.5515 - mae: 3.2007
Epoch 87/500
94/94 [=====] - 1s 11ms/step - loss: 24.2311 - mae: 3.4214
Epoch 88/500
94/94 [=====] - 1s 11ms/step - loss: 21.6834 - mae: 3.1197
Epoch 89/500
94/94 [=====] - 1s 11ms/step - loss: 23.2963 - mae: 3.2804
Epoch 90/500
94/94 [=====] - 1s 11ms/step - loss: 22.5803 - mae: 3.2255
Epoch 91/500
94/94 [=====] - 1s 11ms/step - loss: 22.9435 - mae: 3.2678
Epoch 92/500
94/94 [=====] - 1s 11ms/step - loss: 22.9946 - mae: 3.2492
Epoch 93/500
94/94 [=====] - 1s 11ms/step - loss: 21.8949 - mae: 3.1521
Epoch 94/500
94/94 [=====] - 1s 11ms/step - loss: 22.7477 - mae: 3.2445
Epoch 95/500
94/94 [=====] - 1s 11ms/step - loss: 22.2517 - mae: 3.1707
Epoch 96/500
94/94 [=====] - 1s 11ms/step - loss: 22.5484 - mae: 3.2424
Epoch 97/500
94/94 [=====] - 1s 10ms/step - loss: 21.5473 - mae: 3.1395
Epoch 98/500
94/94 [=====] - 1s 11ms/step - loss: 22.4396 - mae: 3.2505
Epoch 99/500
94/94 [=====] - 1s 11ms/step - loss: 24.8146 - mae: 3.4763
Epoch 100/500
94/94 [=====] - 1s 11ms/step - loss: 22.2609 - mae: 3.2191
Epoch 101/500
94/94 [=====] - 1s 11ms/step - loss: 22.3407 - mae: 3.2249
Epoch 102/500
94/94 [=====] - 1s 11ms/step - loss: 22.7516 - mae: 3.2552
Epoch 103/500
94/94 [=====] - 1s 11ms/step - loss: 21.9434 - mae: 3.1619
Epoch 104/500
94/94 [=====] - 1s 11ms/step - loss: 22.4822 - mae: 3.2110
Epoch 105/500
94/94 [=====] - 1s 11ms/step - loss: 29.8769 - mae: 3.9280
Epoch 106/500
94/94 [=====] - 1s 11ms/step - loss: 23.4997 - mae: 3.3321
Epoch 107/500
94/94 [=====] - 1s 11ms/step - loss: 21.9463 - mae: 3.1658
Epoch 108/500
94/94 [=====] - 1s 11ms/step - loss: 21.5499 - mae: 3.1116
Epoch 109/500
94/94 [=====] - 1s 11ms/step - loss: 22.7138 - mae: 3.2621
Epoch 110/500
94/94 [=====] - 1s 11ms/step - loss: 22.6666 - mae: 3.2656
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94/94 [=====] - 1s 11ms/step - loss: 23.0800 - mae: 3.3056
Epoch 111/500
94/94 [=====] - 1s 11ms/step - loss: 21.2873 - mae: 3.0915
Epoch 112/500
94/94 [=====] - 1s 11ms/step - loss: 22.5083 - mae: 3.2165
Epoch 113/500
94/94 [=====] - 1s 11ms/step - loss: 21.4437 - mae: 3.1083
Epoch 114/500
94/94 [=====] - 1s 11ms/step - loss: 21.4252 - mae: 3.1475
Epoch 115/500
94/94 [=====] - 1s 11ms/step - loss: 21.6504 - mae: 3.1260
Epoch 116/500
94/94 [=====] - 1s 11ms/step - loss: 22.0850 - mae: 3.1667
Epoch 117/500
94/94 [=====] - 1s 11ms/step - loss: 21.3929 - mae: 3.1136
Epoch 118/500
94/94 [=====] - 1s 11ms/step - loss: 21.7492 - mae: 3.1652
Epoch 119/500
94/94 [=====] - 1s 10ms/step - loss: 21.6794 - mae: 3.1390
Epoch 120/500
94/94 [=====] - 1s 11ms/step - loss: 21.8048 - mae: 3.1431
Epoch 121/500
94/94 [=====] - 1s 10ms/step - loss: 21.8563 - mae: 3.1721
Epoch 122/500
94/94 [=====] - 1s 11ms/step - loss: 21.1373 - mae: 3.0954
Epoch 123/500
94/94 [=====] - 1s 11ms/step - loss: 21.6882 - mae: 3.1588
Epoch 124/500
94/94 [=====] - 1s 11ms/step - loss: 21.6074 - mae: 3.1725
Epoch 125/500
94/94 [=====] - 1s 11ms/step - loss: 22.5727 - mae: 3.2897
Epoch 126/500
94/94 [=====] - 1s 11ms/step - loss: 22.1914 - mae: 3.1933
Epoch 127/500
94/94 [=====] - 1s 11ms/step - loss: 21.9813 - mae: 3.1896
Epoch 128/500
94/94 [=====] - 1s 10ms/step - loss: 22.8436 - mae: 3.2698
Epoch 129/500
94/94 [=====] - 1s 11ms/step - loss: 22.4373 - mae: 3.2214
Epoch 130/500
94/94 [=====] - 1s 11ms/step - loss: 22.6592 - mae: 3.2470
Epoch 131/500
94/94 [=====] - 1s 11ms/step - loss: 20.9384 - mae: 3.0797
Epoch 132/500
94/94 [=====] - 1s 11ms/step - loss: 20.4979 - mae: 3.0165
Epoch 133/500
94/94 [=====] - 1s 11ms/step - loss: 20.5846 - mae: 3.0416
Epoch 134/500
94/94 [=====] - 1s 11ms/step - loss: 21.7864 - mae: 3.1241
Epoch 135/500
94/94 [=====] - 1s 11ms/step - loss: 24.9256 - mae: 3.4524
Epoch 136/500
94/94 [=====] - 1s 11ms/step - loss: 21.5886 - mae: 3.1170
Epoch 137/500
94/94 [=====] - 1s 11ms/step - loss: 21.0990 - mae: 3.1106
Epoch 138/500
94/94 [=====] - 1s 11ms/step - loss: 21.7004 - mae: 3.1476
Epoch 139/500
94/94 [=====] - 1s 10ms/step - loss: 21.0300 - mae: 3.0783
Epoch 140/500
94/94 [=====] - 1s 11ms/step - loss: 25.7582 - mae: 3.5320
Epoch 141/500
94/94 [=====] - 1s 11ms/step - loss: 20.8388 - mae: 3.0338
Epoch 142/500
94/94 [=====] - 1s 11ms/step - loss: 20.2664 - mae: 3.0033
Epoch 143/500
94/94 [=====] - 1s 11ms/step - loss: 21.7753 - mae: 3.1638
Epoch 144/500
94/94 [=====] - 1s 11ms/step - loss: 21.1958 - mae: 3.0857
Epoch 145/500
94/94 [=====] - 1s 11ms/step - loss: 22.2606 - mae: 3.2245
Epoch 146/500
94/94 [=====] - 1s 10ms/step - loss: 21.6560 - mae: 3.1214
Epoch 147/500
94/94 [=====] - 1s 11ms/step - loss: 20.7867 - mae: 3.0714
Epoch 148/500
94/94 [=====] - 1s 11ms/step - loss: 22.4344 - mae: 3.2410
Epoch 149/500
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Epoch 149/500
94/94 [=====] - 1s 11ms/step - loss: 23.5756 - mae: 3.3757
Epoch 150/500
94/94 [=====] - 1s 11ms/step - loss: 21.8291 - mae: 3.2086
Epoch 151/500
94/94 [=====] - 1s 11ms/step - loss: 22.4077 - mae: 3.2051
Epoch 152/500
94/94 [=====] - 1s 11ms/step - loss: 21.1873 - mae: 3.0776
Epoch 153/500
94/94 [=====] - 1s 11ms/step - loss: 20.9042 - mae: 3.0829
Epoch 154/500
94/94 [=====] - 1s 11ms/step - loss: 23.3142 - mae: 3.3304
Epoch 155/500
94/94 [=====] - 1s 11ms/step - loss: 20.4681 - mae: 3.0309
Epoch 156/500
94/94 [=====] - 1s 11ms/step - loss: 23.1925 - mae: 3.3332
Epoch 157/500
94/94 [=====] - 1s 11ms/step - loss: 20.3855 - mae: 3.0087
Epoch 158/500
94/94 [=====] - 1s 11ms/step - loss: 21.2074 - mae: 3.1344
Epoch 159/500
94/94 [=====] - 1s 11ms/step - loss: 21.6414 - mae: 3.1906
Epoch 160/500
94/94 [=====] - 1s 11ms/step - loss: 20.5427 - mae: 3.0115
Epoch 161/500
94/94 [=====] - 1s 10ms/step - loss: 22.3396 - mae: 3.1934
Epoch 162/500
94/94 [=====] - 1s 11ms/step - loss: 20.8446 - mae: 3.0469
Epoch 163/500
94/94 [=====] - 1s 11ms/step - loss: 20.9991 - mae: 3.0612
Epoch 164/500
94/94 [=====] - 1s 10ms/step - loss: 21.2175 - mae: 3.1015
Epoch 165/500
94/94 [=====] - 1s 11ms/step - loss: 22.3292 - mae: 3.2423
Epoch 166/500
94/94 [=====] - 1s 11ms/step - loss: 21.0130 - mae: 3.0750
Epoch 167/500
94/94 [=====] - 1s 11ms/step - loss: 20.7085 - mae: 3.0631
Epoch 168/500
94/94 [=====] - 1s 11ms/step - loss: 21.3695 - mae: 3.1401
Epoch 169/500
94/94 [=====] - 1s 11ms/step - loss: 20.9859 - mae: 3.0777
Epoch 170/500
94/94 [=====] - 1s 11ms/step - loss: 20.1615 - mae: 3.0056
Epoch 171/500
94/94 [=====] - 1s 11ms/step - loss: 20.8315 - mae: 3.0901
Epoch 172/500
94/94 [=====] - 1s 11ms/step - loss: 20.2492 - mae: 2.9919
Epoch 173/500
94/94 [=====] - 1s 11ms/step - loss: 20.5532 - mae: 3.0338
Epoch 174/500
94/94 [=====] - 1s 11ms/step - loss: 20.7731 - mae: 3.0725
Epoch 175/500
94/94 [=====] - 1s 11ms/step - loss: 20.5776 - mae: 3.0553
Epoch 176/500
94/94 [=====] - 1s 11ms/step - loss: 20.8999 - mae: 3.0842
Epoch 177/500
94/94 [=====] - 1s 11ms/step - loss: 20.4238 - mae: 3.0239
Epoch 178/500
94/94 [=====] - 1s 11ms/step - loss: 21.4502 - mae: 3.1252
Epoch 179/500
94/94 [=====] - 1s 11ms/step - loss: 20.5348 - mae: 3.0162
Epoch 180/500
94/94 [=====] - 1s 10ms/step - loss: 21.5902 - mae: 3.1437
Epoch 181/500
94/94 [=====] - 1s 11ms/step - loss: 20.2059 - mae: 2.9943
Epoch 182/500
94/94 [=====] - 1s 11ms/step - loss: 21.4011 - mae: 3.0970
Epoch 183/500
94/94 [=====] - 1s 11ms/step - loss: 20.6607 - mae: 3.0468
Epoch 184/500
94/94 [=====] - 1s 11ms/step - loss: 20.6521 - mae: 3.0206
Epoch 185/500
94/94 [=====] - 1s 11ms/step - loss: 21.5404 - mae: 3.1434
Epoch 186/500
94/94 [=====] - 1s 11ms/step - loss: 21.6742 - mae: 3.1443
Epoch 187/500
```

94/94 [=====] - 1s 11ms/step - loss: 20.6194 - mae: 3.0351
Epoch 188/500
94/94 [=====] - 1s 11ms/step - loss: 21.3159 - mae: 3.1160
Epoch 189/500
94/94 [=====] - 1s 11ms/step - loss: 20.9441 - mae: 3.0719
Epoch 190/500
94/94 [=====] - 1s 10ms/step - loss: 20.3819 - mae: 3.0243
Epoch 191/500
94/94 [=====] - 1s 11ms/step - loss: 20.3857 - mae: 3.0453
Epoch 192/500
94/94 [=====] - 1s 11ms/step - loss: 20.6151 - mae: 3.0428
Epoch 193/500
94/94 [=====] - 1s 11ms/step - loss: 21.5712 - mae: 3.1381
Epoch 194/500
94/94 [=====] - 1s 11ms/step - loss: 22.0910 - mae: 3.2032
Epoch 195/500
94/94 [=====] - 1s 10ms/step - loss: 20.6520 - mae: 3.0399
Epoch 196/500
94/94 [=====] - 1s 10ms/step - loss: 21.0161 - mae: 3.0960
Epoch 197/500
94/94 [=====] - 1s 11ms/step - loss: 20.9707 - mae: 3.0891
Epoch 198/500
94/94 [=====] - 1s 11ms/step - loss: 20.3410 - mae: 3.0097
Epoch 199/500
94/94 [=====] - 1s 11ms/step - loss: 21.5752 - mae: 3.1447
Epoch 200/500
94/94 [=====] - 1s 11ms/step - loss: 21.2956 - mae: 3.0988
Epoch 201/500
94/94 [=====] - 1s 11ms/step - loss: 21.1833 - mae: 3.1056
Epoch 202/500
94/94 [=====] - 1s 11ms/step - loss: 21.0760 - mae: 3.0833
Epoch 203/500
94/94 [=====] - 1s 10ms/step - loss: 20.7953 - mae: 3.0589
Epoch 204/500
94/94 [=====] - 1s 10ms/step - loss: 21.0335 - mae: 3.0975
Epoch 205/500
94/94 [=====] - 1s 11ms/step - loss: 20.0976 - mae: 2.9756
Epoch 206/500
94/94 [=====] - 1s 11ms/step - loss: 20.1527 - mae: 2.9890
Epoch 207/500
94/94 [=====] - 1s 10ms/step - loss: 20.4775 - mae: 3.0584
Epoch 208/500
94/94 [=====] - 1s 11ms/step - loss: 20.1251 - mae: 2.9780
Epoch 209/500
94/94 [=====] - 1s 11ms/step - loss: 20.1537 - mae: 2.9819
Epoch 210/500
94/94 [=====] - 1s 11ms/step - loss: 20.6301 - mae: 3.0732
Epoch 211/500
94/94 [=====] - 1s 11ms/step - loss: 21.7429 - mae: 3.1931
Epoch 212/500
94/94 [=====] - 1s 11ms/step - loss: 19.9527 - mae: 3.0070
Epoch 213/500
94/94 [=====] - 1s 11ms/step - loss: 20.0129 - mae: 2.9622
Epoch 214/500
94/94 [=====] - 1s 11ms/step - loss: 19.7294 - mae: 2.9234
Epoch 215/500
94/94 [=====] - 1s 11ms/step - loss: 20.0879 - mae: 2.9764
Epoch 216/500
94/94 [=====] - 1s 11ms/step - loss: 23.6110 - mae: 3.3028
Epoch 217/500
94/94 [=====] - 1s 11ms/step - loss: 20.2658 - mae: 3.0085
Epoch 218/500
94/94 [=====] - 1s 11ms/step - loss: 21.6308 - mae: 3.1605
Epoch 219/500
94/94 [=====] - 1s 11ms/step - loss: 21.2198 - mae: 3.0916
Epoch 220/500
94/94 [=====] - 1s 11ms/step - loss: 20.1959 - mae: 3.0016
Epoch 221/500
94/94 [=====] - 1s 11ms/step - loss: 20.5249 - mae: 3.0381
Epoch 222/500
94/94 [=====] - 1s 11ms/step - loss: 20.3979 - mae: 2.9885
Epoch 223/500
94/94 [=====] - 1s 11ms/step - loss: 19.9920 - mae: 2.9865
Epoch 224/500
94/94 [=====] - 1s 10ms/step - loss: 21.4081 - mae: 3.1199
Epoch 225/500
94/94 [=====] - 1s 10ms/step - loss: 20.4834 - mae: 3.0233

Epoch 226/500
94/94 [=====] - 1s 11ms/step - loss: 21.5365 - mae: 3.1389
Epoch 227/500
94/94 [=====] - 1s 11ms/step - loss: 21.0700 - mae: 3.0664
Epoch 228/500
94/94 [=====] - 1s 11ms/step - loss: 21.0551 - mae: 3.0862
Epoch 229/500
94/94 [=====] - 1s 11ms/step - loss: 20.4744 - mae: 3.0407
Epoch 230/500
94/94 [=====] - 1s 11ms/step - loss: 21.4635 - mae: 3.1512
Epoch 231/500
94/94 [=====] - 1s 11ms/step - loss: 19.8024 - mae: 2.9490
Epoch 232/500
94/94 [=====] - 1s 10ms/step - loss: 20.7541 - mae: 3.0615
Epoch 233/500
94/94 [=====] - 1s 11ms/step - loss: 21.2955 - mae: 3.0976
Epoch 234/500
94/94 [=====] - 1s 10ms/step - loss: 21.8558 - mae: 3.1707
Epoch 235/500
94/94 [=====] - 1s 11ms/step - loss: 20.3973 - mae: 3.0017
Epoch 236/500
94/94 [=====] - 1s 11ms/step - loss: 20.8176 - mae: 3.0433
Epoch 237/500
94/94 [=====] - 1s 11ms/step - loss: 21.9545 - mae: 3.2219
Epoch 238/500
94/94 [=====] - 1s 10ms/step - loss: 20.3758 - mae: 3.0038
Epoch 239/500
94/94 [=====] - 1s 10ms/step - loss: 20.0553 - mae: 2.9885
Epoch 240/500
94/94 [=====] - 1s 11ms/step - loss: 20.3129 - mae: 3.0319
Epoch 241/500
94/94 [=====] - 1s 10ms/step - loss: 20.9119 - mae: 3.0825
Epoch 242/500
94/94 [=====] - 1s 11ms/step - loss: 21.7406 - mae: 3.1984
Epoch 243/500
94/94 [=====] - 1s 11ms/step - loss: 21.5194 - mae: 3.1192
Epoch 244/500
94/94 [=====] - 1s 11ms/step - loss: 20.9909 - mae: 3.1037
Epoch 245/500
94/94 [=====] - 1s 10ms/step - loss: 20.8095 - mae: 3.0662
Epoch 246/500
94/94 [=====] - 1s 11ms/step - loss: 21.1041 - mae: 3.1024
Epoch 247/500
94/94 [=====] - 1s 11ms/step - loss: 19.9219 - mae: 2.9639
Epoch 248/500
94/94 [=====] - 1s 11ms/step - loss: 21.3390 - mae: 3.1007
Epoch 249/500
94/94 [=====] - 1s 11ms/step - loss: 19.9898 - mae: 2.9622
Epoch 250/500
94/94 [=====] - 1s 11ms/step - loss: 20.2270 - mae: 3.0003
Epoch 251/500
94/94 [=====] - 1s 10ms/step - loss: 20.8288 - mae: 3.0829
Epoch 252/500
94/94 [=====] - 1s 11ms/step - loss: 21.0175 - mae: 3.0600
Epoch 253/500
94/94 [=====] - 1s 11ms/step - loss: 20.1876 - mae: 2.9927
Epoch 254/500
94/94 [=====] - 1s 11ms/step - loss: 19.9836 - mae: 2.9835
Epoch 255/500
94/94 [=====] - 1s 11ms/step - loss: 20.8168 - mae: 3.0846
Epoch 256/500
94/94 [=====] - 1s 10ms/step - loss: 20.4073 - mae: 3.0273
Epoch 257/500
94/94 [=====] - 1s 10ms/step - loss: 20.5301 - mae: 3.0393
Epoch 258/500
94/94 [=====] - 1s 10ms/step - loss: 19.8521 - mae: 2.9595
Epoch 259/500
94/94 [=====] - 1s 11ms/step - loss: 21.0645 - mae: 3.1025
Epoch 260/500
94/94 [=====] - 1s 10ms/step - loss: 20.5715 - mae: 3.0398
Epoch 261/500
94/94 [=====] - 1s 10ms/step - loss: 20.1250 - mae: 2.9952
Epoch 262/500
94/94 [=====] - 1s 10ms/step - loss: 20.8332 - mae: 3.0839
Epoch 263/500
94/94 [=====] - 1s 11ms/step - loss: 20.2041 - mae: 3.0135
Epoch 264/500

94/94 [=====] - 1s 11ms/step - loss: 20.4463 - mae: 3.0605
Epoch 265/500
94/94 [=====] - 1s 11ms/step - loss: 20.9269 - mae: 3.0748
Epoch 266/500
94/94 [=====] - 1s 11ms/step - loss: 20.1095 - mae: 3.0167
Epoch 267/500
94/94 [=====] - 1s 11ms/step - loss: 20.0071 - mae: 2.9731
Epoch 268/500
94/94 [=====] - 1s 11ms/step - loss: 21.0842 - mae: 3.0871
Epoch 269/500
94/94 [=====] - 1s 11ms/step - loss: 20.6483 - mae: 3.0450
Epoch 270/500
94/94 [=====] - 1s 11ms/step - loss: 21.9282 - mae: 3.1746
Epoch 271/500
94/94 [=====] - 1s 11ms/step - loss: 20.4064 - mae: 3.0432
Epoch 272/500
94/94 [=====] - 1s 11ms/step - loss: 21.7811 - mae: 3.1757
Epoch 273/500
94/94 [=====] - 1s 11ms/step - loss: 20.8637 - mae: 3.0835
Epoch 274/500
94/94 [=====] - 1s 11ms/step - loss: 20.9121 - mae: 3.0842
Epoch 275/500
94/94 [=====] - 1s 11ms/step - loss: 20.0291 - mae: 2.9863
Epoch 276/500
94/94 [=====] - 1s 11ms/step - loss: 20.0255 - mae: 2.9702
Epoch 277/500
94/94 [=====] - 1s 11ms/step - loss: 21.0011 - mae: 3.0712
Epoch 278/500
94/94 [=====] - 1s 11ms/step - loss: 19.8755 - mae: 2.9564
Epoch 279/500
94/94 [=====] - 1s 11ms/step - loss: 19.9959 - mae: 2.9696
Epoch 280/500
94/94 [=====] - 1s 11ms/step - loss: 19.5955 - mae: 2.9248
Epoch 281/500
94/94 [=====] - 1s 11ms/step - loss: 21.7965 - mae: 3.1607
Epoch 282/500
94/94 [=====] - 1s 11ms/step - loss: 19.8317 - mae: 2.9583
Epoch 283/500
94/94 [=====] - 1s 11ms/step - loss: 21.1762 - mae: 3.1102
Epoch 284/500
94/94 [=====] - 1s 11ms/step - loss: 21.4144 - mae: 3.1398
Epoch 285/500
94/94 [=====] - 1s 11ms/step - loss: 19.8516 - mae: 2.9680
Epoch 286/500
94/94 [=====] - 1s 11ms/step - loss: 20.5029 - mae: 3.0271
Epoch 287/500
94/94 [=====] - 1s 11ms/step - loss: 20.6375 - mae: 3.0502
Epoch 288/500
94/94 [=====] - 1s 11ms/step - loss: 20.4505 - mae: 3.0328
Epoch 289/500
94/94 [=====] - 1s 11ms/step - loss: 20.7957 - mae: 3.0680
Epoch 290/500
94/94 [=====] - 1s 11ms/step - loss: 19.6834 - mae: 2.9487
Epoch 291/500
94/94 [=====] - 1s 11ms/step - loss: 20.0955 - mae: 2.9706
Epoch 292/500
94/94 [=====] - 1s 11ms/step - loss: 20.4205 - mae: 3.0356
Epoch 293/500
94/94 [=====] - 1s 11ms/step - loss: 20.5306 - mae: 3.0093
Epoch 294/500
94/94 [=====] - 1s 11ms/step - loss: 20.0705 - mae: 2.9921
Epoch 295/500
94/94 [=====] - 1s 11ms/step - loss: 19.5986 - mae: 2.9353
Epoch 296/500
94/94 [=====] - 1s 11ms/step - loss: 19.6608 - mae: 2.9765
Epoch 297/500
94/94 [=====] - 1s 11ms/step - loss: 21.5185 - mae: 3.1188
Epoch 298/500
94/94 [=====] - 1s 11ms/step - loss: 20.0247 - mae: 2.9898
Epoch 299/500
94/94 [=====] - 1s 11ms/step - loss: 20.6907 - mae: 3.0834
Epoch 300/500
94/94 [=====] - 1s 11ms/step - loss: 20.1575 - mae: 3.0018
Epoch 301/500
94/94 [=====] - 1s 11ms/step - loss: 19.8291 - mae: 2.9682
Epoch 302/500
94/94 [=====] - 1s 11ms/step - loss: 20.2225 - mae: 2.9935

Epoch 303/500
94/94 [=====] - 1s 10ms/step - loss: 20.2512 - mae: 3.0097
Epoch 304/500
94/94 [=====] - 1s 11ms/step - loss: 20.7094 - mae: 3.0655
Epoch 305/500
94/94 [=====] - 1s 10ms/step - loss: 21.7470 - mae: 3.1606
Epoch 306/500
94/94 [=====] - 1s 10ms/step - loss: 19.7005 - mae: 2.9708
Epoch 307/500
94/94 [=====] - 1s 10ms/step - loss: 20.3173 - mae: 3.0184
Epoch 308/500
94/94 [=====] - 1s 11ms/step - loss: 20.2947 - mae: 3.0025
Epoch 309/500
94/94 [=====] - 1s 11ms/step - loss: 20.3485 - mae: 3.0132
Epoch 310/500
94/94 [=====] - 1s 11ms/step - loss: 21.0470 - mae: 3.0957
Epoch 311/500
94/94 [=====] - 1s 11ms/step - loss: 19.9760 - mae: 2.9649
Epoch 312/500
94/94 [=====] - 1s 11ms/step - loss: 21.1094 - mae: 3.1284
Epoch 313/500
94/94 [=====] - 1s 11ms/step - loss: 19.7361 - mae: 2.9476
Epoch 314/500
94/94 [=====] - 1s 11ms/step - loss: 20.6286 - mae: 3.0278
Epoch 315/500
94/94 [=====] - 1s 11ms/step - loss: 19.8656 - mae: 2.9867
Epoch 316/500
94/94 [=====] - 1s 11ms/step - loss: 20.7833 - mae: 3.0784
Epoch 317/500
94/94 [=====] - 1s 11ms/step - loss: 20.9079 - mae: 3.1065
Epoch 318/500
94/94 [=====] - 1s 11ms/step - loss: 20.0565 - mae: 2.9876
Epoch 319/500
94/94 [=====] - 1s 10ms/step - loss: 20.1753 - mae: 3.0285
Epoch 320/500
94/94 [=====] - 1s 11ms/step - loss: 23.1851 - mae: 3.3163
Epoch 321/500
94/94 [=====] - 1s 11ms/step - loss: 20.0141 - mae: 2.9703
Epoch 322/500
94/94 [=====] - 1s 10ms/step - loss: 19.8593 - mae: 2.9576
Epoch 323/500
94/94 [=====] - 1s 11ms/step - loss: 20.6969 - mae: 3.0458
Epoch 324/500
94/94 [=====] - 1s 11ms/step - loss: 22.2788 - mae: 3.2227
Epoch 325/500
94/94 [=====] - 1s 10ms/step - loss: 19.9894 - mae: 2.9907
Epoch 326/500
94/94 [=====] - 1s 11ms/step - loss: 19.7632 - mae: 2.9482
Epoch 327/500
94/94 [=====] - 1s 10ms/step - loss: 19.6963 - mae: 2.9529
Epoch 328/500
94/94 [=====] - 1s 10ms/step - loss: 20.6278 - mae: 3.0604
Epoch 329/500
94/94 [=====] - 1s 11ms/step - loss: 22.6375 - mae: 3.2417
Epoch 330/500
94/94 [=====] - 1s 11ms/step - loss: 20.3001 - mae: 3.0164
Epoch 331/500
94/94 [=====] - 1s 11ms/step - loss: 20.2204 - mae: 3.0043
Epoch 332/500
94/94 [=====] - 1s 10ms/step - loss: 19.9652 - mae: 2.9729
Epoch 333/500
94/94 [=====] - 1s 11ms/step - loss: 20.5551 - mae: 3.0252
Epoch 334/500
94/94 [=====] - 1s 11ms/step - loss: 20.7681 - mae: 3.0693
Epoch 335/500
94/94 [=====] - 1s 11ms/step - loss: 19.9867 - mae: 3.0137
Epoch 336/500
94/94 [=====] - 1s 11ms/step - loss: 20.0798 - mae: 2.9979
Epoch 337/500
94/94 [=====] - 1s 11ms/step - loss: 20.0707 - mae: 2.9655
Epoch 338/500
94/94 [=====] - 1s 11ms/step - loss: 19.4712 - mae: 2.9085
Epoch 339/500
94/94 [=====] - 1s 11ms/step - loss: 20.2753 - mae: 2.9986
Epoch 340/500
94/94 [=====] - 1s 11ms/step - loss: 20.5241 - mae: 3.0326
Epoch 341/500

94/94 [=====] - 1s 11ms/step - loss: 19.6770 - mae: 2.9451
Epoch 342/500
94/94 [=====] - 1s 11ms/step - loss: 19.5318 - mae: 2.9364
Epoch 343/500
94/94 [=====] - 1s 11ms/step - loss: 20.7584 - mae: 3.0912
Epoch 344/500
94/94 [=====] - 1s 11ms/step - loss: 20.0868 - mae: 2.9748
Epoch 345/500
94/94 [=====] - 1s 11ms/step - loss: 20.3465 - mae: 3.0003
Epoch 346/500
94/94 [=====] - 1s 11ms/step - loss: 20.5252 - mae: 3.0250
Epoch 347/500
94/94 [=====] - 1s 11ms/step - loss: 19.9503 - mae: 2.9702
Epoch 348/500
94/94 [=====] - 1s 11ms/step - loss: 19.6917 - mae: 2.9660
Epoch 349/500
94/94 [=====] - 1s 11ms/step - loss: 20.0214 - mae: 2.9782
Epoch 350/500
94/94 [=====] - 1s 11ms/step - loss: 20.1338 - mae: 2.9843
Epoch 351/500
94/94 [=====] - 1s 11ms/step - loss: 20.0232 - mae: 2.9860
Epoch 352/500
94/94 [=====] - 1s 11ms/step - loss: 20.7426 - mae: 3.0467
Epoch 353/500
94/94 [=====] - 1s 11ms/step - loss: 20.1603 - mae: 2.9854
Epoch 354/500
94/94 [=====] - 1s 11ms/step - loss: 19.6834 - mae: 2.9550
Epoch 355/500
94/94 [=====] - 1s 11ms/step - loss: 20.2000 - mae: 3.0038
Epoch 356/500
94/94 [=====] - 1s 11ms/step - loss: 19.8630 - mae: 2.9800
Epoch 357/500
94/94 [=====] - 1s 11ms/step - loss: 21.6419 - mae: 3.1732
Epoch 358/500
94/94 [=====] - 1s 11ms/step - loss: 20.2883 - mae: 3.0384
Epoch 359/500
94/94 [=====] - 1s 11ms/step - loss: 19.8416 - mae: 2.9785
Epoch 360/500
94/94 [=====] - 1s 11ms/step - loss: 19.9178 - mae: 2.9744
Epoch 361/500
94/94 [=====] - 1s 11ms/step - loss: 20.4117 - mae: 3.0360
Epoch 362/500
94/94 [=====] - 1s 11ms/step - loss: 20.3043 - mae: 3.0239
Epoch 363/500
94/94 [=====] - 1s 11ms/step - loss: 20.7742 - mae: 3.0530
Epoch 364/500
94/94 [=====] - 1s 11ms/step - loss: 20.0857 - mae: 2.9943
Epoch 365/500
94/94 [=====] - 1s 11ms/step - loss: 19.9846 - mae: 2.9775
Epoch 366/500
94/94 [=====] - 1s 11ms/step - loss: 20.4059 - mae: 3.0387
Epoch 367/500
94/94 [=====] - 1s 11ms/step - loss: 21.3081 - mae: 3.1301
Epoch 368/500
94/94 [=====] - 1s 11ms/step - loss: 20.6335 - mae: 3.0484
Epoch 369/500
94/94 [=====] - 1s 11ms/step - loss: 19.4817 - mae: 2.9516
Epoch 370/500
94/94 [=====] - 1s 11ms/step - loss: 20.1899 - mae: 2.9776
Epoch 371/500
94/94 [=====] - 1s 11ms/step - loss: 19.9621 - mae: 2.9579
Epoch 372/500
94/94 [=====] - 1s 11ms/step - loss: 19.6800 - mae: 2.9397
Epoch 373/500
94/94 [=====] - 1s 11ms/step - loss: 20.0659 - mae: 2.9710
Epoch 374/500
94/94 [=====] - 1s 11ms/step - loss: 19.3183 - mae: 2.9142
Epoch 375/500
94/94 [=====] - 1s 11ms/step - loss: 20.4434 - mae: 3.0319
Epoch 376/500
94/94 [=====] - 1s 11ms/step - loss: 20.1796 - mae: 3.0104
Epoch 377/500
94/94 [=====] - 1s 11ms/step - loss: 20.6282 - mae: 3.0482
Epoch 378/500
94/94 [=====] - 1s 11ms/step - loss: 21.0570 - mae: 3.1172
Epoch 379/500
94/94 [=====] - 1s 11ms/step - loss: 20.6523 - mae: 3.0412

Epoch 380/500
94/94 [=====] - 1s 11ms/step - loss: 22.5262 - mae: 3.2265
Epoch 381/500
94/94 [=====] - 1s 11ms/step - loss: 19.6806 - mae: 2.9642
Epoch 382/500
94/94 [=====] - 1s 11ms/step - loss: 19.2743 - mae: 2.8969
Epoch 383/500
94/94 [=====] - 1s 11ms/step - loss: 19.9027 - mae: 2.9904
Epoch 384/500
94/94 [=====] - 1s 11ms/step - loss: 19.8157 - mae: 2.9628
Epoch 385/500
94/94 [=====] - 1s 11ms/step - loss: 20.6204 - mae: 3.0534
Epoch 386/500
94/94 [=====] - 1s 11ms/step - loss: 19.4245 - mae: 2.9372
Epoch 387/500
94/94 [=====] - 1s 11ms/step - loss: 20.3850 - mae: 3.0649
Epoch 388/500
94/94 [=====] - 1s 11ms/step - loss: 20.2862 - mae: 2.9904
Epoch 389/500
94/94 [=====] - 1s 11ms/step - loss: 20.8577 - mae: 3.0988
Epoch 390/500
94/94 [=====] - 1s 11ms/step - loss: 20.3449 - mae: 3.0506
Epoch 391/500
94/94 [=====] - 1s 11ms/step - loss: 20.1067 - mae: 2.9881
Epoch 392/500
94/94 [=====] - 1s 11ms/step - loss: 19.9083 - mae: 2.9564
Epoch 393/500
94/94 [=====] - 1s 11ms/step - loss: 19.7274 - mae: 2.9364
Epoch 394/500
94/94 [=====] - 1s 11ms/step - loss: 19.9132 - mae: 2.9773
Epoch 395/500
94/94 [=====] - 1s 11ms/step - loss: 19.4730 - mae: 2.9269
Epoch 396/500
94/94 [=====] - 1s 11ms/step - loss: 19.6056 - mae: 2.9314
Epoch 397/500
94/94 [=====] - 1s 11ms/step - loss: 20.4185 - mae: 3.0681
Epoch 398/500
94/94 [=====] - 1s 11ms/step - loss: 19.4113 - mae: 2.9458
Epoch 399/500
94/94 [=====] - 1s 11ms/step - loss: 21.6251 - mae: 3.1401
Epoch 400/500
94/94 [=====] - 1s 11ms/step - loss: 20.0713 - mae: 2.9976
Epoch 401/500
94/94 [=====] - 1s 11ms/step - loss: 20.0572 - mae: 2.9905
Epoch 402/500
94/94 [=====] - 1s 11ms/step - loss: 19.2695 - mae: 2.9212
Epoch 403/500
94/94 [=====] - 1s 11ms/step - loss: 19.8198 - mae: 2.9564
Epoch 404/500
94/94 [=====] - 1s 11ms/step - loss: 19.2818 - mae: 2.8962
Epoch 405/500
94/94 [=====] - 1s 11ms/step - loss: 19.5479 - mae: 2.9403
Epoch 406/500
94/94 [=====] - 1s 11ms/step - loss: 19.9967 - mae: 2.9827
Epoch 407/500
94/94 [=====] - 1s 11ms/step - loss: 19.5811 - mae: 2.9466
Epoch 408/500
94/94 [=====] - 1s 11ms/step - loss: 19.6921 - mae: 2.9484
Epoch 409/500
94/94 [=====] - 1s 11ms/step - loss: 20.9477 - mae: 3.0941
Epoch 410/500
94/94 [=====] - 1s 11ms/step - loss: 19.9976 - mae: 3.0077
Epoch 411/500
94/94 [=====] - 1s 11ms/step - loss: 19.5090 - mae: 2.9467
Epoch 412/500
94/94 [=====] - 1s 11ms/step - loss: 20.1795 - mae: 2.9957
Epoch 413/500
94/94 [=====] - 1s 11ms/step - loss: 20.2946 - mae: 3.0288
Epoch 414/500
94/94 [=====] - 1s 11ms/step - loss: 20.3733 - mae: 3.0405
Epoch 415/500
94/94 [=====] - 1s 11ms/step - loss: 21.8227 - mae: 3.1987
Epoch 416/500
94/94 [=====] - 1s 11ms/step - loss: 19.8562 - mae: 2.9493
Epoch 417/500
94/94 [=====] - 1s 11ms/step - loss: 20.0838 - mae: 2.9991
Epoch 418/500


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-
94/94 [=====] - 1s 11ms/step - loss: 19.5072 - mae: 2.9231
Epoch 419/500
94/94 [=====] - 1s 11ms/step - loss: 19.7957 - mae: 2.9576
Epoch 420/500
94/94 [=====] - 1s 11ms/step - loss: 19.6350 - mae: 2.9662
Epoch 421/500
94/94 [=====] - 1s 11ms/step - loss: 20.4850 - mae: 3.0387
Epoch 422/500
94/94 [=====] - 1s 11ms/step - loss: 19.5877 - mae: 2.9423
Epoch 423/500
94/94 [=====] - 1s 11ms/step - loss: 19.7165 - mae: 2.9603
Epoch 424/500
94/94 [=====] - 1s 11ms/step - loss: 20.4419 - mae: 3.0556
Epoch 425/500
94/94 [=====] - 1s 11ms/step - loss: 20.1487 - mae: 2.9971
Epoch 426/500
94/94 [=====] - 1s 11ms/step - loss: 19.3572 - mae: 2.9056
Epoch 427/500
94/94 [=====] - 1s 11ms/step - loss: 20.9387 - mae: 3.0853
Epoch 428/500
94/94 [=====] - 1s 11ms/step - loss: 20.1156 - mae: 3.0083
Epoch 429/500
94/94 [=====] - 1s 11ms/step - loss: 19.5032 - mae: 2.9370
Epoch 430/500
94/94 [=====] - 1s 11ms/step - loss: 20.4837 - mae: 3.0320
Epoch 431/500
94/94 [=====] - 1s 11ms/step - loss: 19.9459 - mae: 2.9730
Epoch 432/500
94/94 [=====] - 1s 11ms/step - loss: 19.3194 - mae: 2.9152
Epoch 433/500
94/94 [=====] - 1s 11ms/step - loss: 20.2872 - mae: 3.0083
Epoch 434/500
94/94 [=====] - 1s 11ms/step - loss: 20.3410 - mae: 3.0328
Epoch 435/500
94/94 [=====] - 1s 11ms/step - loss: 22.7720 - mae: 3.2971
Epoch 436/500
94/94 [=====] - 1s 11ms/step - loss: 19.5419 - mae: 2.9350
Epoch 437/500
94/94 [=====] - 1s 11ms/step - loss: 19.5661 - mae: 2.9403
Epoch 438/500
94/94 [=====] - 1s 11ms/step - loss: 20.3398 - mae: 3.0013
Epoch 439/500
94/94 [=====] - 1s 11ms/step - loss: 19.7846 - mae: 2.9389
Epoch 440/500
94/94 [=====] - 1s 11ms/step - loss: 19.2173 - mae: 2.8906
Epoch 441/500
94/94 [=====] - 1s 11ms/step - loss: 20.2482 - mae: 2.9946
Epoch 442/500
94/94 [=====] - 1s 11ms/step - loss: 19.7251 - mae: 2.9551
Epoch 443/500
94/94 [=====] - 1s 11ms/step - loss: 20.4920 - mae: 3.0504
Epoch 444/500
94/94 [=====] - 1s 11ms/step - loss: 20.0092 - mae: 2.9844
Epoch 445/500
94/94 [=====] - 1s 12ms/step - loss: 20.3991 - mae: 3.0487
Epoch 446/500
94/94 [=====] - 1s 11ms/step - loss: 21.1824 - mae: 3.1109
Epoch 447/500
94/94 [=====] - 1s 11ms/step - loss: 20.3399 - mae: 3.0305
Epoch 448/500
94/94 [=====] - 1s 11ms/step - loss: 20.7872 - mae: 3.0713
Epoch 449/500
94/94 [=====] - 1s 11ms/step - loss: 19.5300 - mae: 2.9326
Epoch 450/500
94/94 [=====] - 1s 11ms/step - loss: 19.6589 - mae: 2.9465
Epoch 451/500
94/94 [=====] - 1s 11ms/step - loss: 19.3746 - mae: 2.9045
Epoch 452/500
94/94 [=====] - 1s 11ms/step - loss: 20.1285 - mae: 2.9894
Epoch 453/500
94/94 [=====] - 1s 11ms/step - loss: 19.6014 - mae: 2.9476
Epoch 454/500
94/94 [=====] - 1s 11ms/step - loss: 20.6698 - mae: 3.0946
Epoch 455/500
94/94 [=====] - 1s 11ms/step - loss: 20.5546 - mae: 3.0377
Epoch 456/500
94/94 [=====] - 1s 11ms/step - loss: 19.8264 - mae: 2.9660
```

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Epoch 457/500
94/94 [=====] - 1s 11ms/step - loss: 20.0533 - mae: 3.0012
Epoch 458/500
94/94 [=====] - 1s 11ms/step - loss: 19.7899 - mae: 2.9725
Epoch 459/500
94/94 [=====] - 1s 11ms/step - loss: 19.8179 - mae: 2.9663
Epoch 460/500
94/94 [=====] - 1s 11ms/step - loss: 20.4136 - mae: 3.0577
Epoch 461/500
94/94 [=====] - 1s 11ms/step - loss: 20.5740 - mae: 3.0651
Epoch 462/500
94/94 [=====] - 1s 11ms/step - loss: 20.2253 - mae: 3.0242
Epoch 463/500
94/94 [=====] - 1s 11ms/step - loss: 19.5025 - mae: 2.9270
Epoch 464/500
94/94 [=====] - 1s 11ms/step - loss: 20.2571 - mae: 3.0071
Epoch 465/500
94/94 [=====] - 1s 11ms/step - loss: 19.2889 - mae: 2.9131
Epoch 466/500
94/94 [=====] - 1s 11ms/step - loss: 20.0288 - mae: 2.9924
Epoch 467/500
94/94 [=====] - 1s 11ms/step - loss: 19.7149 - mae: 2.9369
Epoch 468/500
94/94 [=====] - 1s 11ms/step - loss: 19.1995 - mae: 2.8899
Epoch 469/500
94/94 [=====] - 1s 11ms/step - loss: 20.1634 - mae: 2.9885
Epoch 470/500
94/94 [=====] - 1s 11ms/step - loss: 19.8561 - mae: 2.9412
Epoch 471/500
94/94 [=====] - 1s 11ms/step - loss: 19.2307 - mae: 2.9147
Epoch 472/500
94/94 [=====] - 1s 11ms/step - loss: 19.2292 - mae: 2.8979
Epoch 473/500
94/94 [=====] - 1s 11ms/step - loss: 20.2398 - mae: 3.0104
Epoch 474/500
94/94 [=====] - 1s 11ms/step - loss: 20.1848 - mae: 3.0159
Epoch 475/500
94/94 [=====] - 1s 11ms/step - loss: 18.9912 - mae: 2.8694
Epoch 476/500
94/94 [=====] - 1s 11ms/step - loss: 19.2595 - mae: 2.8951
Epoch 477/500
94/94 [=====] - 1s 11ms/step - loss: 21.5276 - mae: 3.1443
Epoch 478/500
94/94 [=====] - 1s 11ms/step - loss: 19.8143 - mae: 2.9628
Epoch 479/500
94/94 [=====] - 1s 11ms/step - loss: 19.7415 - mae: 2.9698
Epoch 480/500
94/94 [=====] - 1s 11ms/step - loss: 20.3447 - mae: 3.0457
Epoch 481/500
94/94 [=====] - 1s 11ms/step - loss: 19.7137 - mae: 2.9773
Epoch 482/500
94/94 [=====] - 1s 11ms/step - loss: 19.6503 - mae: 2.9588
Epoch 483/500
94/94 [=====] - 1s 11ms/step - loss: 19.4037 - mae: 2.9261
Epoch 484/500
94/94 [=====] - 1s 11ms/step - loss: 20.8016 - mae: 3.0734
Epoch 485/500
94/94 [=====] - 1s 11ms/step - loss: 19.1437 - mae: 2.9070
Epoch 486/500
94/94 [=====] - 1s 11ms/step - loss: 19.3403 - mae: 2.9132
Epoch 487/500
94/94 [=====] - 1s 11ms/step - loss: 19.8534 - mae: 2.9852
Epoch 488/500
94/94 [=====] - 1s 11ms/step - loss: 19.1423 - mae: 2.9086
Epoch 489/500
94/94 [=====] - 1s 11ms/step - loss: 19.4380 - mae: 2.9212
Epoch 490/500
94/94 [=====] - 1s 11ms/step - loss: 19.7494 - mae: 2.9476
Epoch 491/500
94/94 [=====] - 1s 11ms/step - loss: 19.8777 - mae: 2.9383
Epoch 492/500
94/94 [=====] - 1s 11ms/step - loss: 21.2750 - mae: 3.1124
Epoch 493/500
94/94 [=====] - 1s 11ms/step - loss: 19.6858 - mae: 2.9468
Epoch 494/500
94/94 [=====] - 1s 11ms/step - loss: 20.1356 - mae: 2.9948
Epoch 495/500
```

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94/94 [=====] - 1s 11ms/step - loss: 19.1227 - mae: 2.8932
Epoch 496/500
94/94 [=====] - 1s 11ms/step - loss: 19.6845 - mae: 2.9502
Epoch 497/500
94/94 [=====] - 1s 11ms/step - loss: 19.3691 - mae: 2.9267
Epoch 498/500
94/94 [=====] - 1s 11ms/step - loss: 19.7436 - mae: 2.9396
Epoch 499/500
94/94 [=====] - 1s 11ms/step - loss: 20.6016 - mae: 3.0397
Epoch 500/500
94/94 [=====] - 1s 11ms/step - loss: 19.3550 - mae: 2.9032

```

In [9]:

```

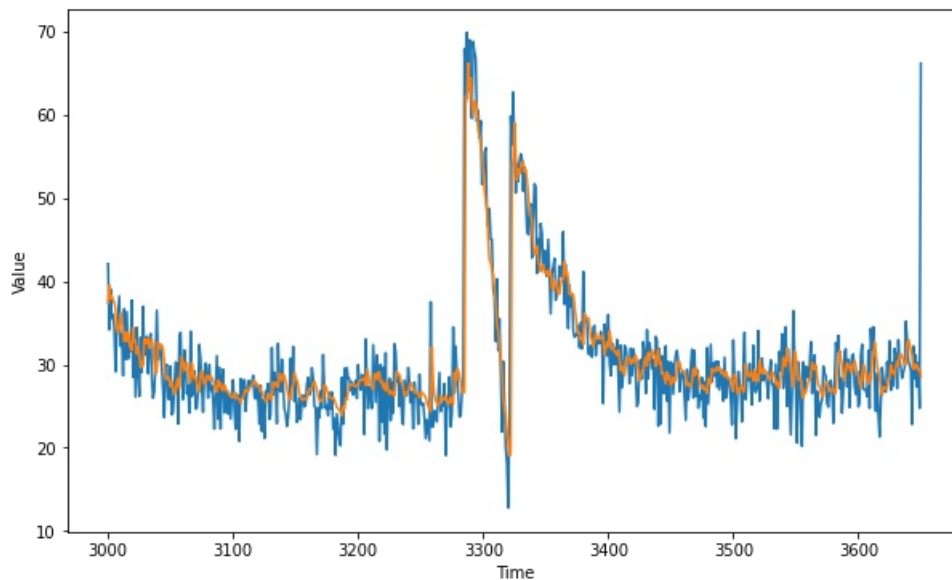
forecast = []
results = []
for time in range(len(series) - window_size):
    forecast.append(model.predict(series[time:time + window_size][np.newaxis]))

forecast = forecast[split_time-window_size:]
results = np.array(forecast)[:, 0, 0]

plt.figure(figsize=(10, 6))

plot_series(time_valid, x_valid)
plot_series(time_valid, results)

```



In [10]:

```
tf.keras.metrics.mean_absolute_error(x_valid, results).numpy()
```

Out[10]:

2.920534

In [11]:

```

import matplotlib.image as mpimg
import matplotlib.pyplot as plt

#-----
# Retrieve a list of list results on training and test data
# sets for each training epoch
#-----
mae=history.history['mae']
loss=history.history['loss']

epochs=range(len(loss)) # Get number of epochs

```

```

#-----
# Plot MAE and Loss
#-----

plt.plot(epochs, mae, 'r')
plt.plot(epochs, loss, 'b')
plt.title('MAE and Loss')
plt.xlabel("Epochs")
plt.ylabel("Accuracy")
plt.legend(["MAE", "Loss"])

plt.figure()

epochs_zoom = epochs[200:]
mae_zoom = mae[200:]
loss_zoom = loss[200:]

#-----
# Plot Zoomed MAE and Loss
#-----

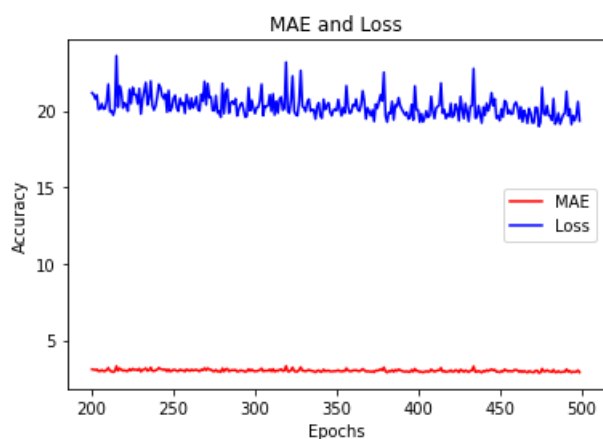
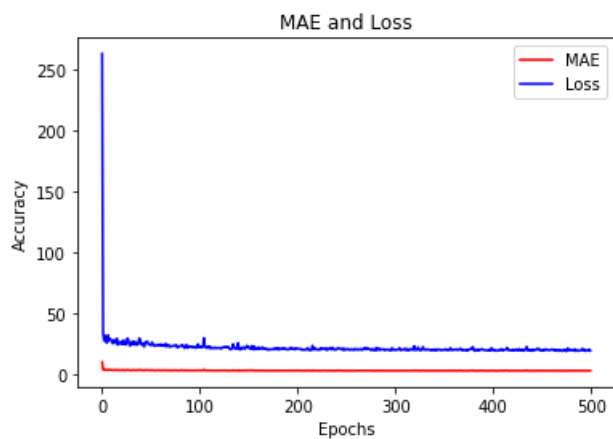
plt.plot(epochs_zoom, mae_zoom, 'r')
plt.plot(epochs_zoom, loss_zoom, 'b')
plt.title('MAE and Loss')
plt.xlabel("Epochs")
plt.ylabel("Accuracy")
plt.legend(["MAE", "Loss"])

plt.figure()

```

Out[11]:

<Figure size 432x288 with 0 Axes>



<Figure size 432x288 with 0 Axes>

In []:

