

In [1]:

```
import pandas as pd
import datetime
import matplotlib.pyplot as plt
import warnings
from sklearn import pipeline, preprocessing, metrics, model_selection, ensemble
from sklearn_pandas import DataFrameMapper
```

In [2]:

```
weather = pd.read_csv("Weather_Dataset.csv", parse_dates=[ "Month"], index_col="Month")
```

In [3]:

```
weather
```

Out[3]:

Temperature

Month	
2010-01-01	21
2010-02-01	24
2010-03-01	30
2010-04-01	33
2010-05-01	36
...	...
2019-08-01	29
2019-09-01	29
2019-10-01	28
2019-11-01	26
2019-12-01	21

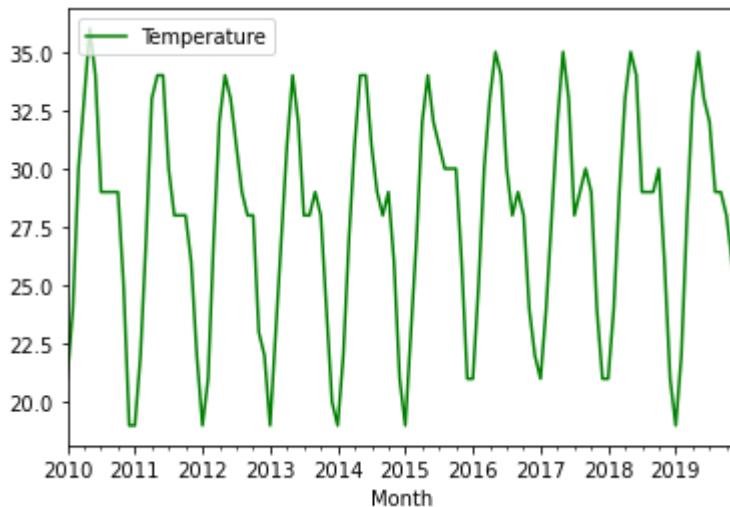
120 rows × 1 columns

In [4]:

```
weather.plot(color='green')
```

Out[4]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x175015f26d0>
```



In [5]:

```
X = weather.values
train = X[0:70] # data for training
test = X[70:] # data for testing
predictions = []
```

In [6]:

```
train.size # total no. of train data
```

Out[6]:

```
70
```

Auto-Regressive Model

In [7]:

```
from statsmodels.tsa.ar_model import AR
from sklearn.metrics import mean_squared_error
```

In [9]:

```
model_ar = AR(train)
model_ar_fit = model_ar.fit()
```

In [10]:

```
predictions = model_ar_fit.predict(start=70, end=100)
```

In [11]:

```
test
```

Out[11]:

```
array([[26],  
       [21],  
       [21],  
       [25],  
       [30],  
       [33],  
       [35],  
       [34],  
       [30],  
       [28],  
       [29],  
       [28],  
       [24],  
       [22],  
       [21],  
       [24],  
       [28],  
       [32],  
       [35],  
       [33],  
       [28],  
       [29],  
       [30],  
       [29],  
       [24],  
       [21],  
       [21],  
       [24],  
       [29],  
       [33],  
       [35],  
       [34],  
       [29],  
       [29],  
       [29],  
       [30],  
       [26],  
       [21],  
       [19],  
       [22],  
       [28],  
       [33],  
       [35],  
       [33],  
       [32],  
       [29],  
       [29],  
       [28],  
       [26],  
       [21]], dtype=int64)
```

In [12]:

```
predictions
```

Out[12]:

```
array([25.04898106, 20.66568024, 18.8376725 , 20.94717278, 26.72094645,
       30.94423858, 32.56670209, 32.19426158, 30.41357871, 30.25660949,
       30.59755505, 29.04052977, 25.5889904 , 20.92845302, 18.96743558,
       21.39228454, 26.00144303, 30.46273414, 32.29022598, 31.63971535,
       30.79655539, 30.52723804, 30.58125208, 29.26821763, 25.49283551,
       21.34605036, 19.47304808, 21.30745795, 25.82165134, 29.90248832,
       31.74869574])
```

In [13]:

```
print(test)
print(predictions)
for x in predictions:
    if x>=35:
        print ('Sunny')
    elif x>=25 and x<=35:
        print ('Haze')
    elif x<=25:
        print ('Cloudy')
    else:
        print ('Null')
```

```
[[26]
[21]
[21]
[25]
[30]
[33]
[35]
[34]
[30]
[28]
[29]
[28]
[24]
[22]
[21]
[24]
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[30]
[30]
[26]
[21]
[19]
[22]
[28]
[33]
[35]
[33]
[32]
[29]
[29]]
```

```
[28]
```

```
[26]
```

```
[21]]
```

```
[25.04898106 20.66568024 18.8376725 20.94717278 26.72094645 30.94423858  
32.56670209 32.19426158 30.41357871 30.25660949 30.59755505 29.04052977  
25.5889904 20.92845302 18.96743558 21.39228454 26.00144303 30.46273414  
32.29022598 31.63971535 30.79655539 30.52723804 30.58125208 29.26821763  
25.49283551 21.34605036 19.47304808 21.30745795 25.82165134 29.90248832  
31.74869574]
```

Haze

Cloudy

Cloudy

Cloudy

Haze

Haze

Haze

Haze

Haze

Haze

Haze

Haze

Haze

Cloudy

Cloudy

Cloudy

Haze

Haze

Haze

Haze

Haze

Haze

Haze

Haze

Haze

Cloudy

Cloudy

Cloudy

Haze

Haze

Haze

In [14]:

```
plt.plot(test) # taken data as test  
plt.plot(predictions,color='red') # predicted data
```

Out[14]:

[<matplotlib.lines.Line2D at 0x1750258cd00>]

