

In [54]:

```
import warnings
warnings.filterwarnings("ignore")
```

In [55]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [56]:

```
from sklearn.metrics import mean_squared_error
```

In [57]:

```
df = pd.read_csv('/content/Sales_Data.csv')
```

In [58]:

```
df.isnull().sum()
```

Out[58]:

```
Month      0
Qty         2
dtype: int64
```

In [59]:

```
df['Qty'] = df['Qty'].fillna(df['Qty'].median())
df.head(3)
```

Out[59]:

	Month	Qty
0	Jan-21	25.0
1	Feb-21	25.0
2	Mar-21	33.0

MA (equal weights to all lag values, all lag values are equally significant)

In [60]:

```
df['mavg3'] = np.round(df.Qty.rolling(window = 3).mean().shift(1),0)

# window = 3 -> means 3 days rolling period
# shift(1) -> means 3 days window to be considered from the previous day (t-1)
```

In [61]:

```
df
```

Out[61]:

	Month	Qty	mavg3
0	Jan-21	25.0	NaN
1	Feb-21	25.0	NaN
2	Mar-21	33.0	NaN
3	Apr-21	25.0	28.0

4	May-21	Qty	mavg3
5	Jun-21	30.0	26.0
6	Jul-21	53.0	25.0
7	Aug-21	40.0	34.0
8	Sep-21	30.0	41.0
9	Oct-21	53.0	41.0
10	Nov-21	50.0	41.0
11	Dec-21	30.0	44.0
12	Jan-22	30.0	44.0

In [62]:

```
# defining a function get_mape to calculate MAPE (Mean Absolute Percentage Error)
def get_mape(actual, pred):
    return np.round(np.mean(np.abs(100*(actual-pred)/actual)),2)
```

In [63]:

```
mape = get_mape(df.Qty[3:],df.mavg3[3:]) # calculating MAPE for MA method
mape
```

Out[63]:

30.38

In [64]:

```
rmse = np.round(np.sqrt(mean_squared_error(df.Qty[3:],df.mavg3[3:])),2) # calculating RM
SE (Root Mean Squared Error) for MA method
rmse
```

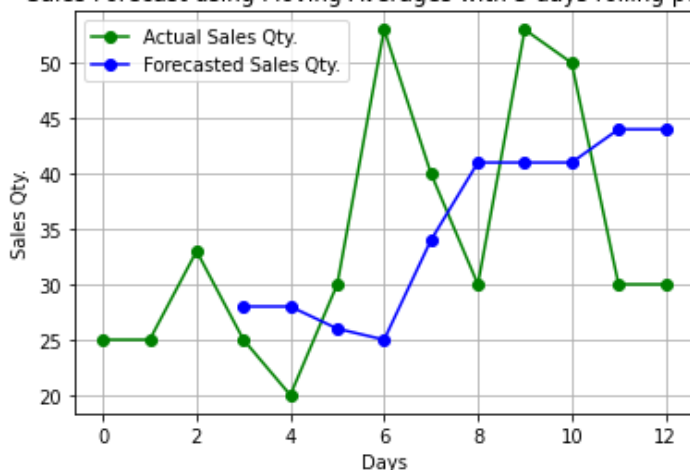
Out[64]:

12.83

In [75]:

```
plt.plot(df.Qty, label = 'Actual Sales Qty.', marker = 'o', color = 'green')
plt.plot(df.mavg3, label = 'Forecasted Sales Qty.', marker = 'o', color = 'blue')
plt.title('Sales Forecast using Moving Averages with 3 days rolling period')
plt.xlabel('Days')
plt.ylabel('Sales Qty.')
plt.legend()
plt.grid(True)
plt.figure(figsize=(15,10))
plt.show()
```

Sales Forecast using Moving Averages with 3 days rolling period



<Figure size 1080x720 with 0 Axes>

