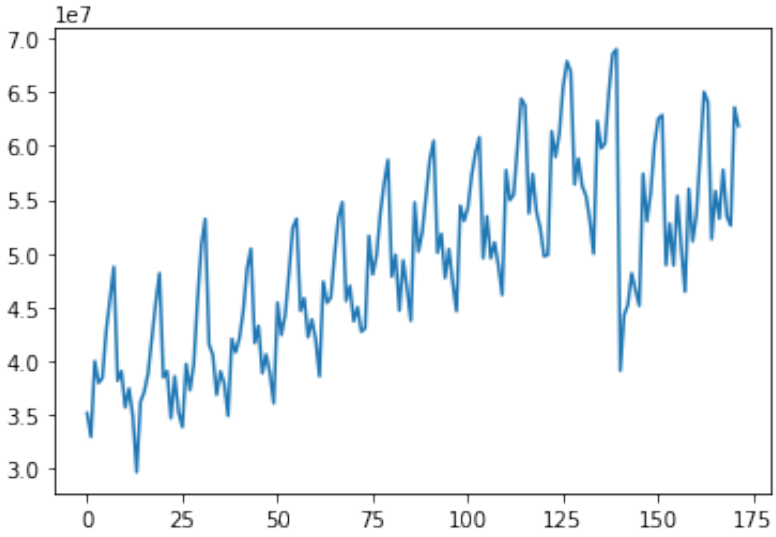
In [2]:
```
import pandas as pd
import numpy as np
```

Question 1 and 2

In [3]:
```
df= pd.read_csv('BTS.csv')
```

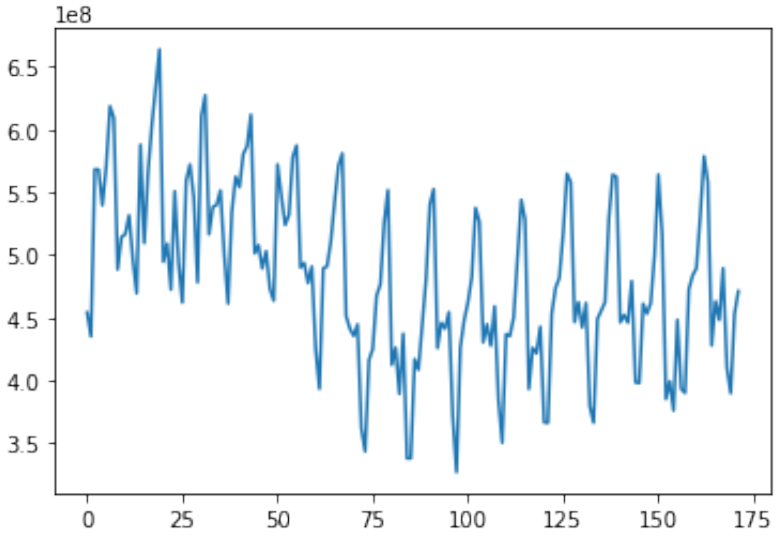
In [4]:
```
df['Air '].plot()
```

Out[4]: <AxesSubplot:>



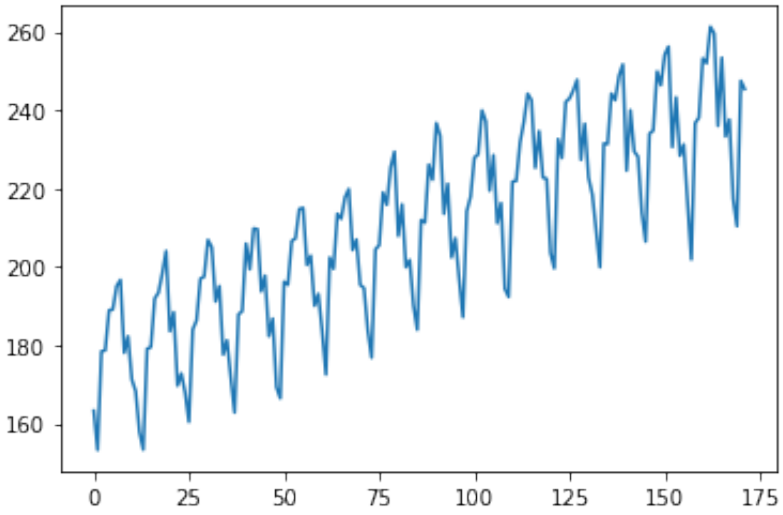

In [5]:
```
df['Rail'].plot()
```

Out[5]: <AxesSubplot:>




In [6]:
```
df['Vehicle'].plot()
```

Out[6]: <AxesSubplot:>



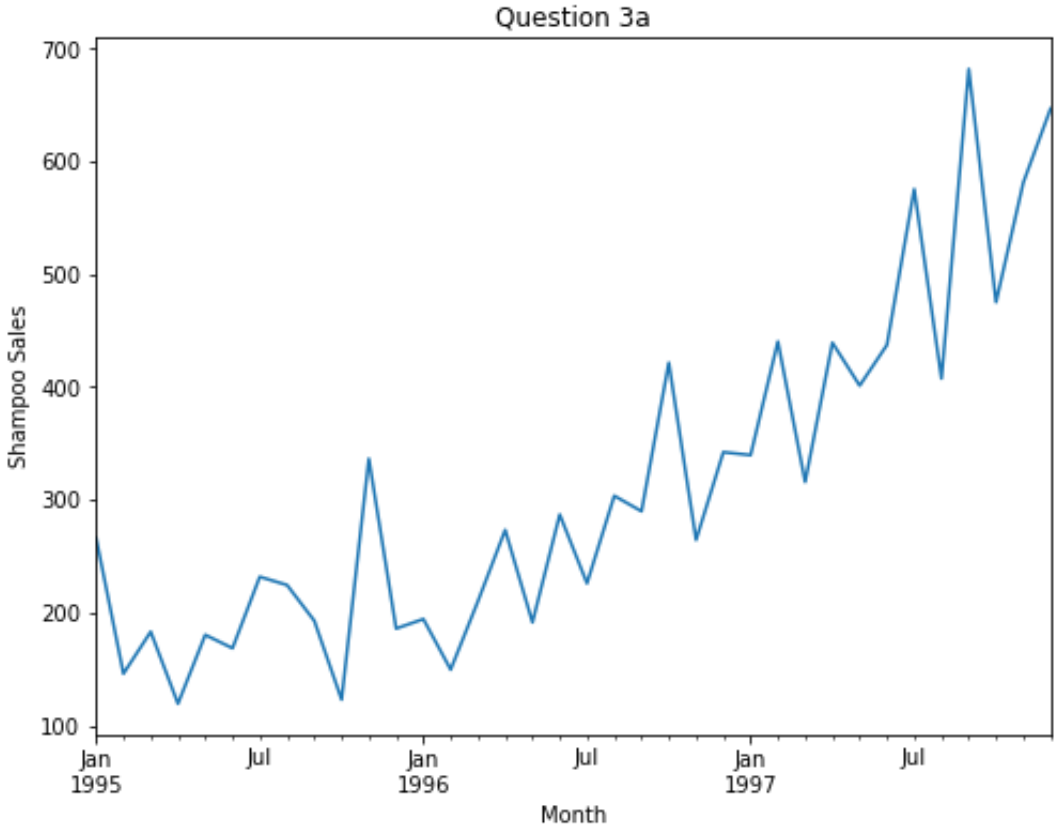

In [7]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

## Question 3

In [8]:
```
df1= pd.read_csv("ShampooSales.csv", parse_dates=True, index_col = "Month"
```

In [9]:
```
df1["Shampoo Sales"].plot(figsize=(8, 6))
plt.title('Question 3a')
plt.xlabel('Month')
plt.ylabel('Shampoo Sales')
```

Out[9]: Text(0, 0.5, 'Shampoo Sales')

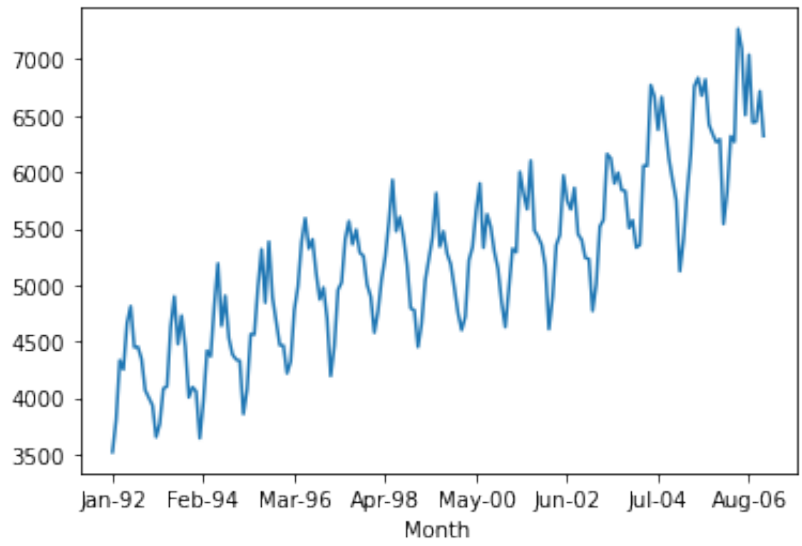



## Question 4

In [10]:
```
df2= pd.read_csv("beverages.csv", parse_dates=True, index_col = "Month")
```

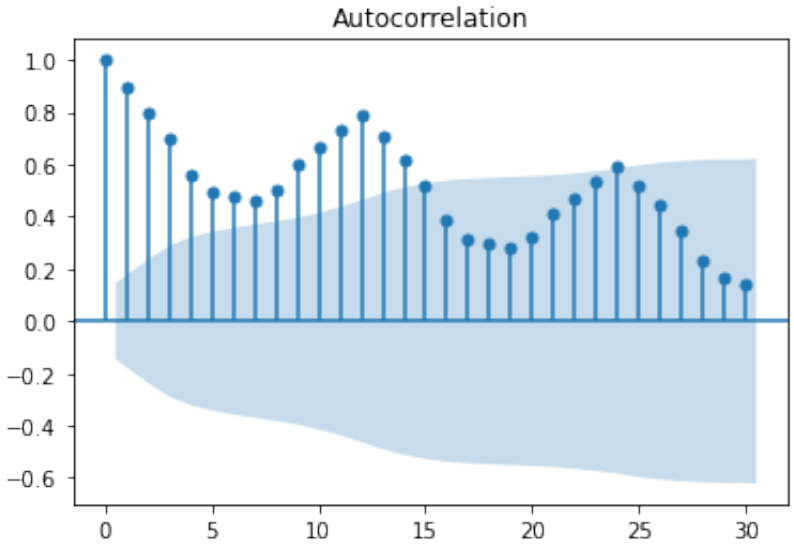
In [11]:
```
df2["Dollars (in Millions)"].plot()
```

Out[11]: <AxesSubplot:xlabel='Month'>



In [12]:
```
import statsmodels.api as sm
```

In [13]:
```
sm.graphics.tsa.plot_acf(df2.values.squeeze(), lags=30)
plt.show()
```

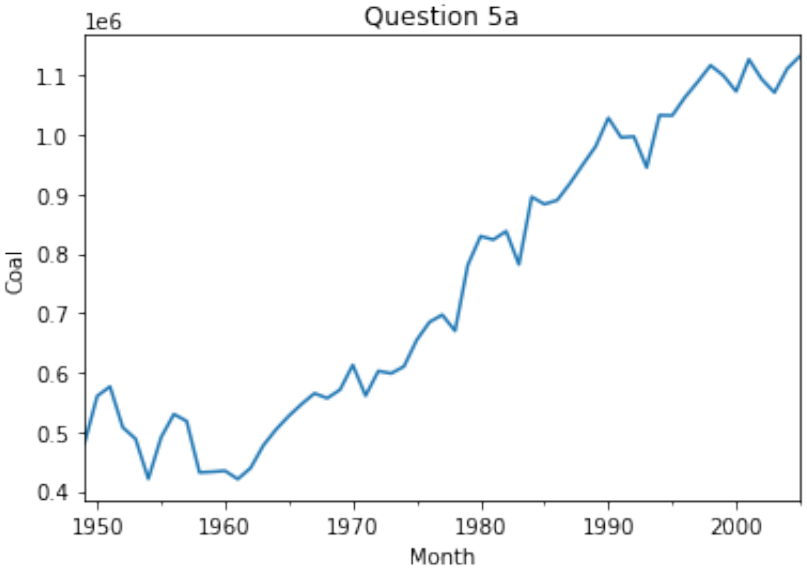



## Question 5

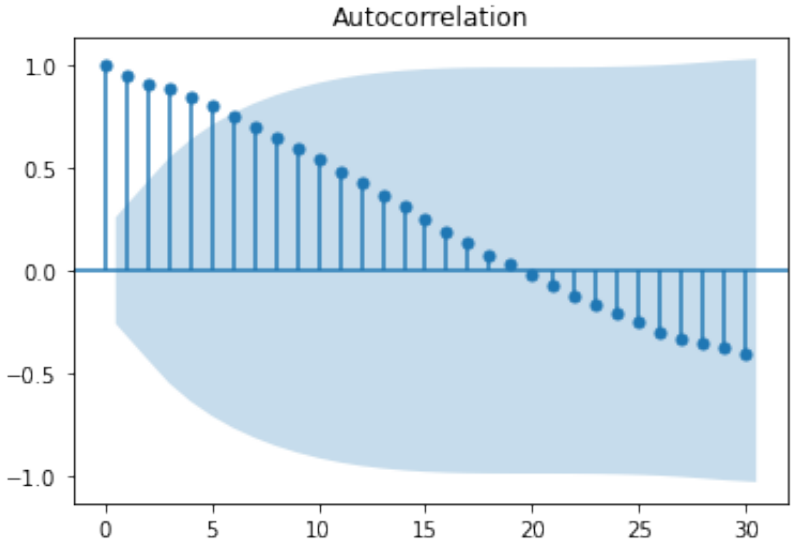
In [14]:
```
df11= pd.read_csv("coal.csv", parse_dates=True, index_col = "Year")
```

In [15]:
```
df11["Coal"].plot()
plt.title('Question 5a')
plt.xlabel('Month')
plt.ylabel('Coal')
```

Out[15]:
```
Text(0, 0.5, 'Coal')
```

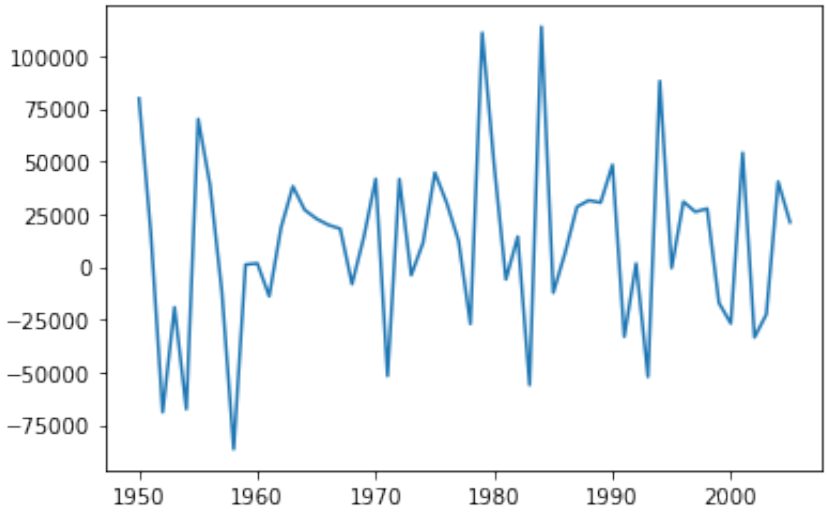


In [16]:
```
sm.graphics.tsa.plot_acf(df11.values.squeeze(), lags=30)
plt.show()
```



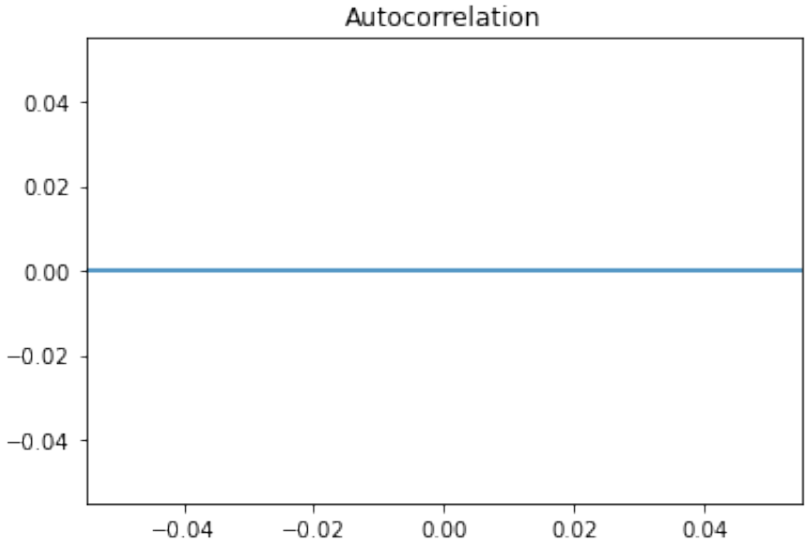

In [34]:
```
from pandas import read_csv
from pandas import datetime
from matplotlib import pyplot
from statsmodels.graphics.tsaplots import plot_acf

series = read_csv('coal.csv', header=0, parse_dates=[0], index_col=0, squee
diff = series.diff()
pyplot.plot(diff)
pyplot.show()
```

```
<ipython-input-34-3e4c4f64294a>:2: FutureWarning: The pandas.datetime class
is deprecated and will be removed from pandas in a future version. Import f
rom datetime module instead.
  from pandas import datetime
```



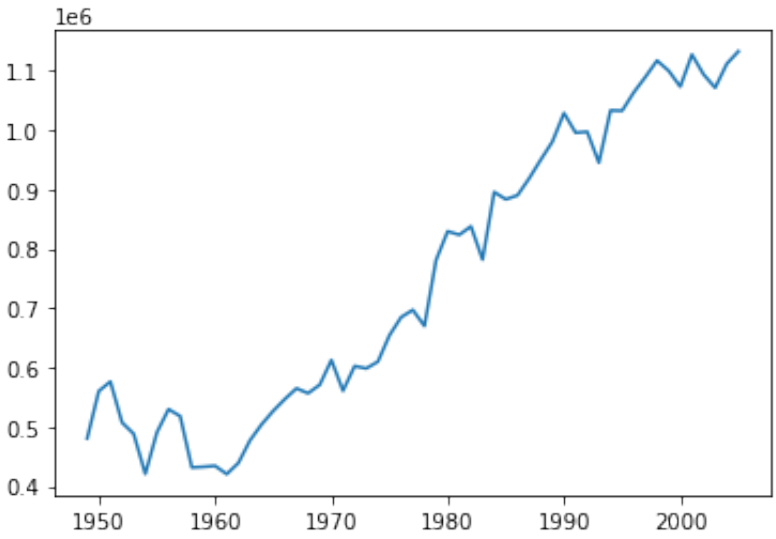

In [35]:
```
sm.graphics.tsa.plot_acf(diff.values.squeeze(), lags=2)
plt.show()
```

```
/opt/anaconda3/lib/python3.8/site-packages/numpy/core/_asarray.py:102: User
Warning: Warning: converting a masked element to nan.
  return array(a, dtype, copy=False, order=order)
```




In [36]:

```
pyplot.plot(series)
pyplot.show()
```



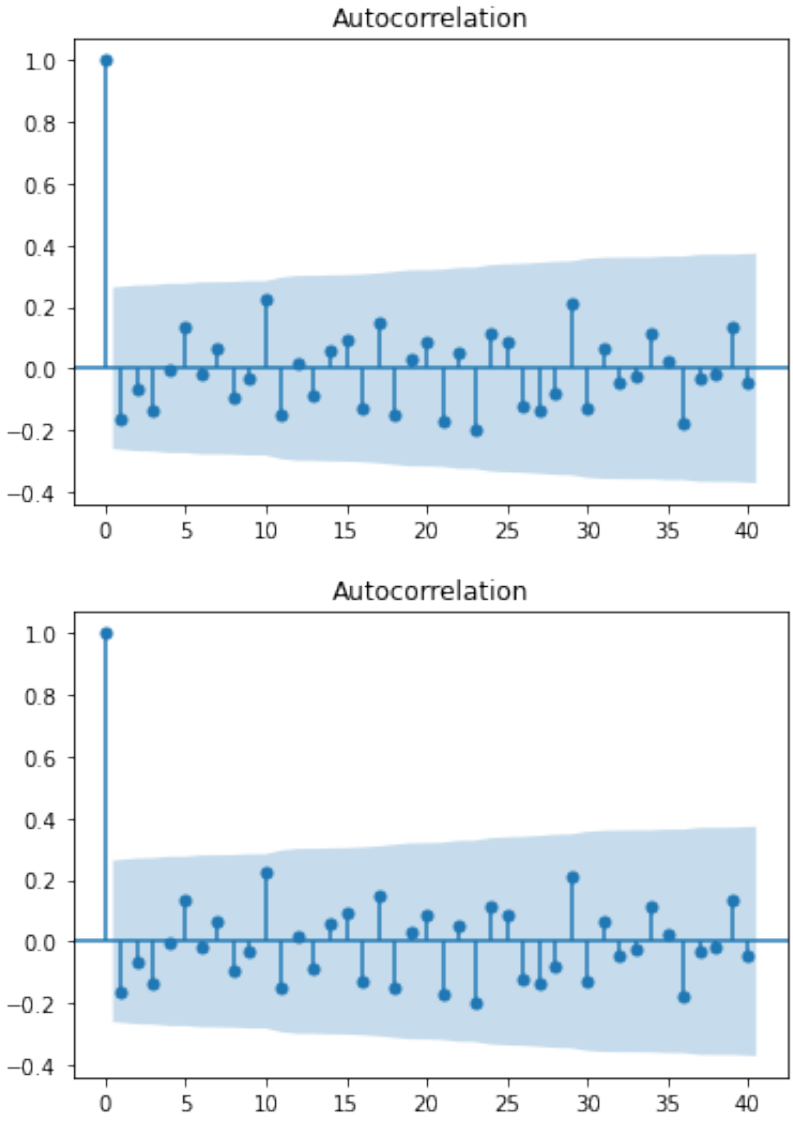

In [41]:

```
diff = series.diff(periods = 1)
```

In [42]:

```
pyplot.show()
plot_acf(diff[1:], lags = 40)
```

Out[42]:


Autocorrelation
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
35
40
Autocorrelation
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
0
5
10
15
20
25
30
35
40

In [ ]: