In [21]:
```
import pandas as pd
from sklearn.ensemble import RandomForestRegressor
from sklearn.feature_selection import SelectFromModel
```

In [2]:
```
df = pd.read_csv("/mnt/c/Users/User/Documents/GitHub/Last-Mile-206/datasets/co
nsolidated.csv")
```

In [4]:
```
# Filling NAN values and other unsupported types
df = df.fillna(0)
df = df.replace(to_replace = '--', value = 0)
# Using the Carbon Emissions by country (kilo tonnes per capita), the top 16 o
ffenders were chosen
country_codes = [137, 88, 11, 183, 144, 97, 185, 30, 8, 126, 83, 179, 140, 86,
149, 119]
```

In [5]:

```
# Building a list of facotrs (average) that might be a direct effect of CO2 em
issions
co2_emissions = []
for itr in country_codes:
    # CO2 Emissions by country
    co2_country = df.loc[itr, '1980':'2016']
    sum_co2_country = co2_country.sum()
    avg_co2_country = sum_co2_country/len(co2_country)
    # GDP Const
    sum_gdp_const_country = 0.0
    gdp_const_country = df.loc[itr, 'gdp_const_1980':'gdp_const_2016']
    for seriesData in gdp_const_country:
        sum_gdp_const_country += float(str(seriesData).replace(',',''))
    avg_gdp_const_country = sum_gdp_const_country/len(gdp_const_country)
    # GDP Curr
    sum_gdp_curr_country = 0.0
    gdp_curr_country = df.loc[itr, 'gdp_curr_1980':'gdp_curr_2016']
    for seriesData in gdp_curr_country:
        sum_gdp_curr_country += float(str(seriesData).replace(',',''))
    avg_gdp_curr_country = sum_gdp_curr_country/len(gdp_curr_country)
    # Average Inflation
    sum_infl_avg_prices_country = 0.0
    infl_avg_prices_country = df.loc[itr, 'infl_avg_prices_1980':'infl_avg_pri
ces_2016']
    for seriesData in infl_avg_prices_country:
        sum_infl_avg_prices_country += float(str(seriesData).replace(',',''))
    avg_infl_avg_prices_country = sum_infl_avg_prices_country/len(infl_avg_pri
ces_country)
    # Unemployment
    sum_unemployment_country = 0.0
    unemployment_country = df.loc[itr, 'unemployment_1980':'unemployment_2016'
]
    for seriesData in unemployment_country:
        sum_unemployment_country += float(str(seriesData).replace(',',''))
    avg_unemployment_country = sum_unemployment_country/len(unemployment_count
ry)
    # Acc Balance
    sum_acc_bal_country = 0.0
    acc_bal_country = df.loc[itr, 'acc_bal_1980':'acc_bal_2016']
    for seriesData in acc_bal_country:
        sum_acc_bal_country += float(str(seriesData).replace(',',''))
    avg_acc_bal_country = sum_acc_bal_country/len(acc_bal_country)
    # Consolidating the results
    co2_emissions.append([itr, avg_co2_country, avg_gdp_const_country, avg_gdp
_curr_country, avg_infl_avg_prices_country, avg_unemployment_country, avg_acc_
bal_country])
```

In [6]:

```
# Converting the list to a Dataframe
co2_emissions_df = pd.DataFrame(co2_emissions, columns = ['country_code', 'avg
_co2', 'avg_gdp_const', 'avg_gdp_curr', 'avg_infl_prices', 'avg_unemployment',
'avg_acc_bal'])
```

In [18]:
```
x_train = co2_emissions_df.iloc[:, 2:7].copy()
print(x_train)
```

```
    avg_gdp_const  avg_gdp_curr  avg_infl_prices  avg_unemployment  \
0        5.951595     93.792135         3.749595          0.000000   
1        3.513514    134.247108         3.453108          1.308270   
2        4.265514     27.222054         1.810270          1.076135   
3        3.701000    277.183108         4.161865          0.000000   
4        2.258973    788.697189         1.234973          2.648892   
5        4.108216     27.218973         2.939081          3.221676   
6        2.644243   9767.411351         3.313054          6.379730   
7        2.383108    890.925946         3.239243          8.380649   
8        3.172973    568.144324         4.227135          6.958324   
9        5.409649     78.568811         2.006081          0.000000   
10       2.454595    154.352568        93.487595          5.239405   
11       4.899162     23.141486       191.570459          0.000000   
12       1.142649   1668.583243        47.359459          5.212324   
13       6.378676    822.673676         5.025946          3.549054   
14       6.608108    187.938459         2.080243          2.882811   
15       2.068676    494.419757         2.024649          5.591027   

    avg_acc_bal  
0     21.260892  
1     19.591919  
2      2.001243  
3     10.251324  
4      3.521514  
5      5.015514  
6     -2.536541  
7     -1.415784  
8     -4.243622  
9      2.744757  
10    -2.728189  
11    -2.074108  
12     3.389595  
13     0.816378  
14    11.981324  
15     4.714838  
```

In [23]:
```
y_train = co2_emissions_df.iloc[:, 1].copy()
print(type(y_train))
```

```
&lt;class &#39;pandas.core.series.Series&#39;&gt;
```

In [30]:
```
sel = SelectFromModel(RandomForestRegressor(n_estimators = 100))
sel.fit(x_train, y_train)
```

Out[30]:
```
SelectFromModel(estimator=RandomForestRegressor())
```

In [31]:
```
print(sel.get_support())
```

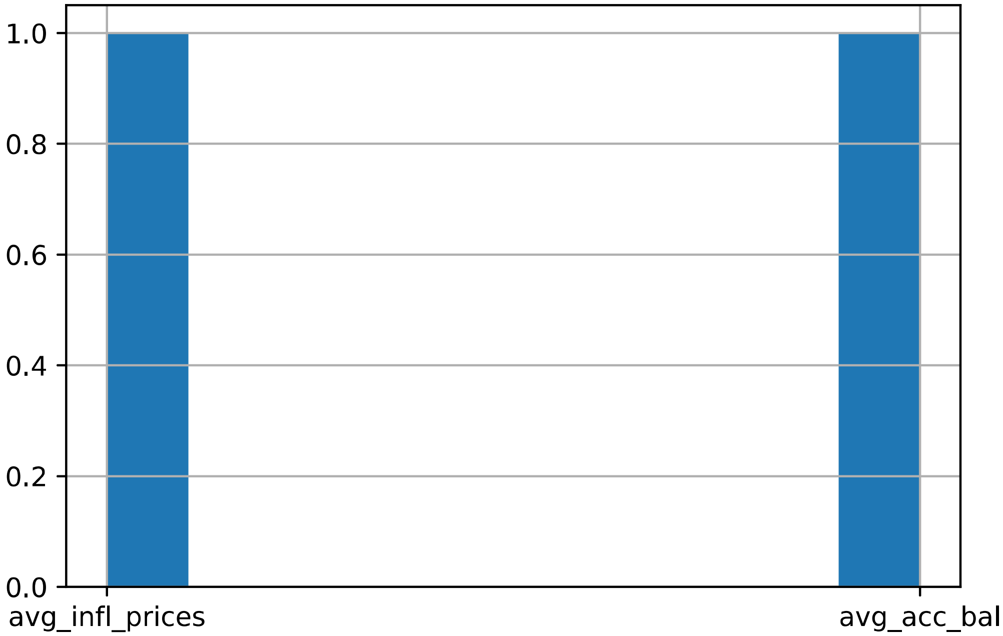
```
[False False  True False  True]
```

In [37]:
```
selected_feat= x_train.columns[(sel.get_support())]
print(len(selected_feat))
print(selected_feat)
```

```
2
Index([&#39;avg_infl_prices&#39;, &#39;avg_acc_bal&#39;], dtype=&#39;object&#
39;)
```

In [38]:
```
pd.Series(selected_feat).hist()
```

Out[38]:
```
&lt;AxesSubplot:&gt;
```



In [ ]: