Lab 4.2

Outlier identification IQR fILLING

Objective

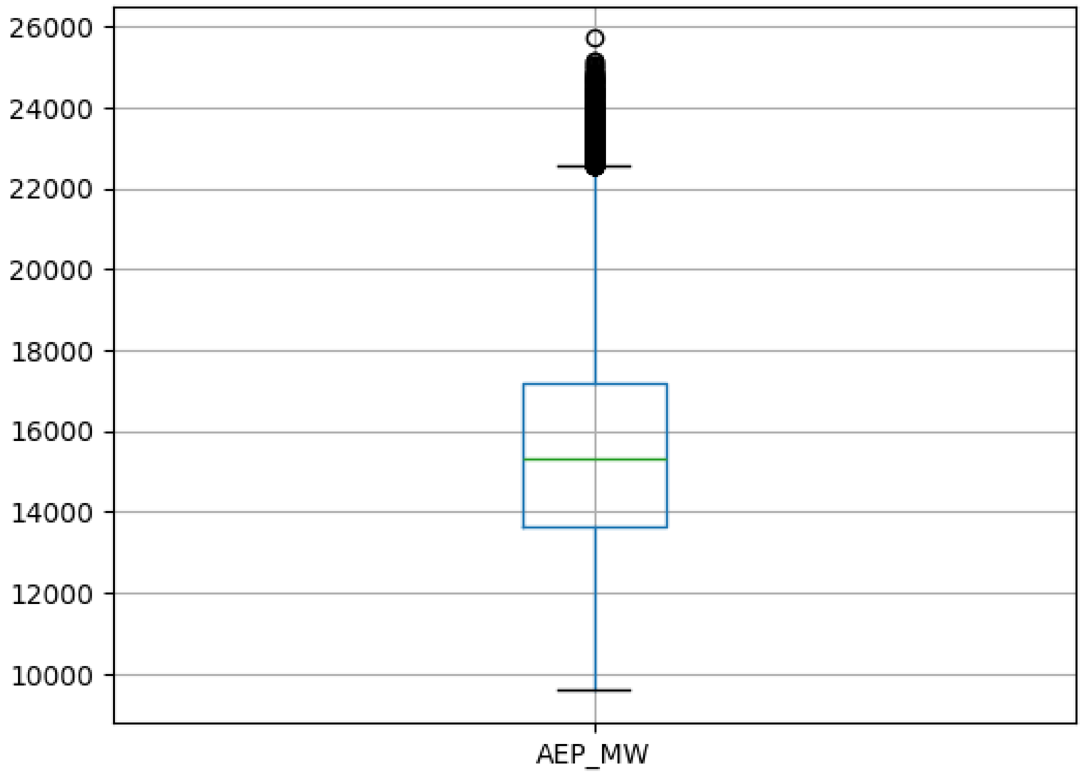
To identify outliers in a dataset using the Interquartile Range (IQR) method and apply appropriate techniques to handle (fill) the outliers for improved data quality.

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

df = pd.read_csv(r'C:\Users\PMLS\labreports\
LAB4\2_Missing_Values_Filled.csv', parse_dates=['Datetime'],
index_col='Datetime')

df.boxplot('AEP_MW')

<Axes: >
```



```
def detect_outliers_iqr(data):
    outliers = []
    #data = sorted(data)
    q1 = data['AEP_MW'].quantile(0.25)
    q3 = data['AEP_MW'].quantile(0.75)
    # print(q1, q3)
    IQR = q3-q1
    lwr_bound = q1-(1.5*IQR)
    upr_bound = q3+(1.5*IQR)
    # print(lwr_bound, upr_bound)
    idx = 2
    idx_list = []
    for i in list(data['AEP_MW']):
        if (i<lwr_bound or i>upr_bound):
            outliers.append(i)
            idx_list.append(idx)
        idx = idx + 1
    data.loc[data['AEP_MW'] < lwr_bound, 'AEP_MW'] = np.nan
    data.loc[data['AEP_MW'] > upr_bound, 'AEP_MW'] = np.nan
    return outliers, data, idx_list# Driver code
```

It calculates the IQR (interquartile range) of the 'AEP_MW' column.

Finds outliers as values below Q1 - 1.5×IQR or above Q3 + 1.5×IQR.

Collects these outlier values and their indices.

Replaces outliers in the DataFrame with NaN.

Returns the outlier values list, the modified DataFrame, and the outlier indices list.

```
sample_outliers, p_data, index_of_out = detect_outliers_iqr(df)
print("Outliers from IQR method: ", sample_outliers)
```

```
Outliers from IQR method:  [22577.0, 22940.0, 22886.0, 22652.0,
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```python
pd.isnull(p_data['AEP_MW']).sum()
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```python
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```

```
df['AEP_MW'] = df['AEP_MW'].interpolate(method='time')
```

```
pd.isnull(p_data['AEP_MW']).sum()
```

```
np.int64(0)
```

```
p_data.reset_index(inplace=True)
```

```
p_data.to_csv(r'C:\Users\PMLS\ML\
LAB4\3_Outlier_Identified.csv',index=False)
```

```
print(pd.__version__)
```

```
2.2.3
```