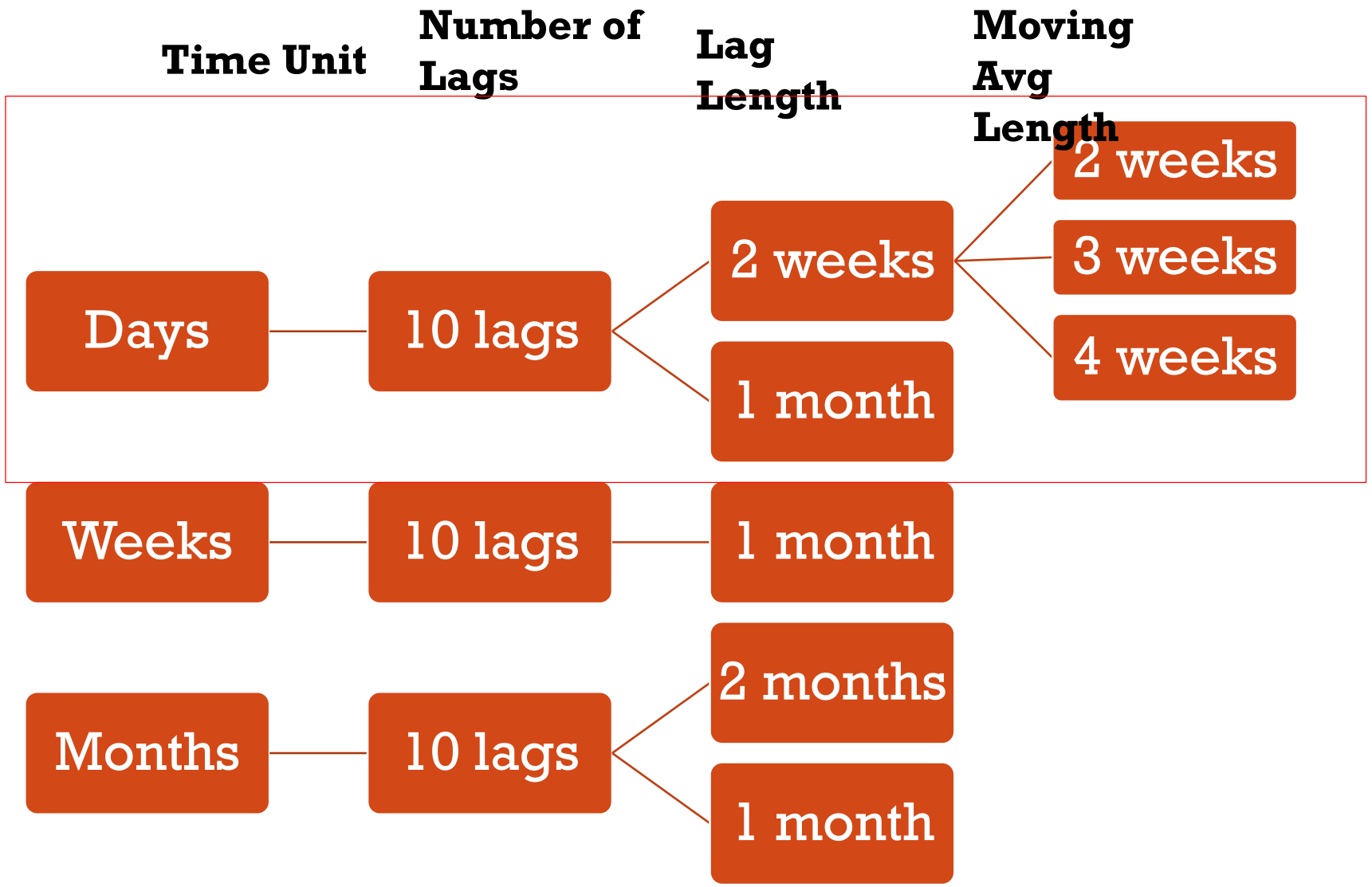
Time Series Analysis Results

Oct 24, 2019

Chiemi Kato

PARAMETERS

NOTE: Focused on Days, since at a glance it performed much stronger



MAE RESULTS (ALL 1 YEAR GAP FROM Y TARGET)

Model	Time Unit	# Lags	Lag Length	Rollavg Window	Parameters	MAE
KNN	Busi. Day	10	1 month	8 weeks	K=2	$1199.13270
Polynomial	Busi. Day	10	1 month	8 weeks	Deg=3	$1173.80122
Adaboost	Busi. Day	10	1 month	8 weeks	{'learning_rate': 0.0001, 'n_estimators': 150}	$1841.94740
KNN	Busi. Day	10	1 month	2 weeks	K=7	$1253.4538
Polynomial	Busi. Day	10	1 month	2 weeks	Deg=3	$1264.15163
Adaboost	Busi. Day	10	1 month	2 weeks	{'learning_rate': 0.0001, 'n_estimators': 50}	$1364.1369
KNN	Busi. Day	10	2 week	3 weeks	K=6	$1045.21761
Polynomial	Busi. Day	10	2 week	3 weeks	Deg=3	$1301.42426
Adaboost	Busi. Day	10	2 week	3 weeks	{'learning_rate': 0.0001, 'n_estimators': 50}	$1336.64916
KNN	Busi. Day	10	1 month	4 weeks	K=7	$974.02
Polynomial	Busi. Day	10	1 month	4 weeks	Deg=3	$1417.294
Adaboost	Busi. Day	10	1 month	4 weeks	{'learning_rate': 0.0001, 'n_estimators': 50}	$1401.205

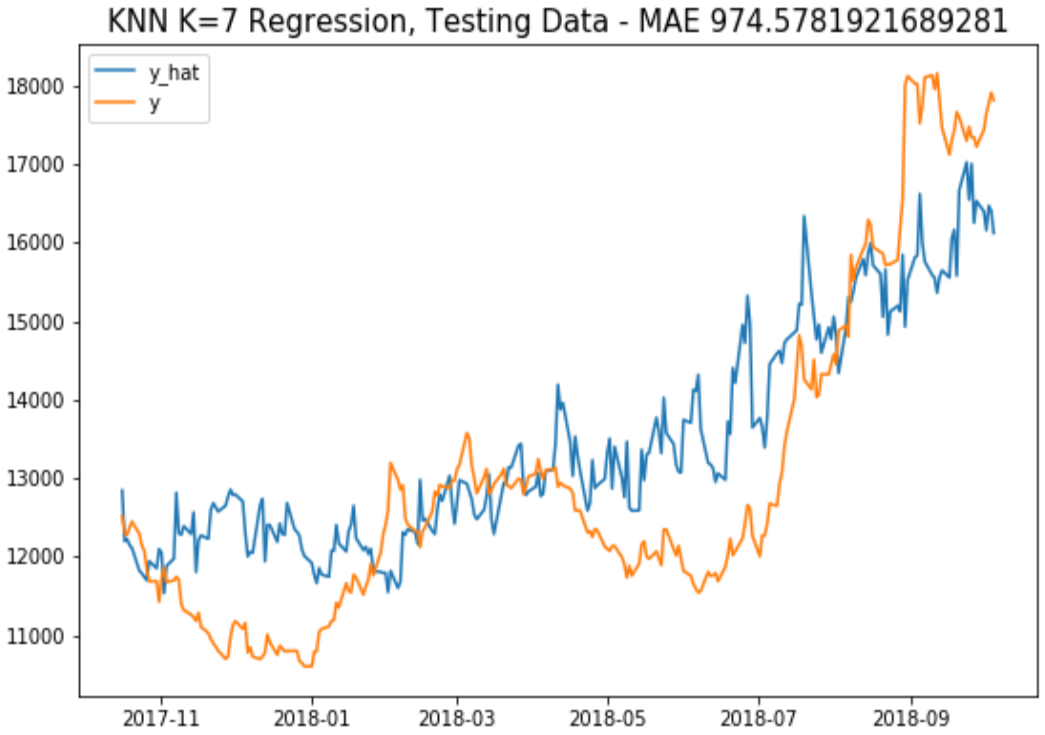
PREPROCESSING METHODS

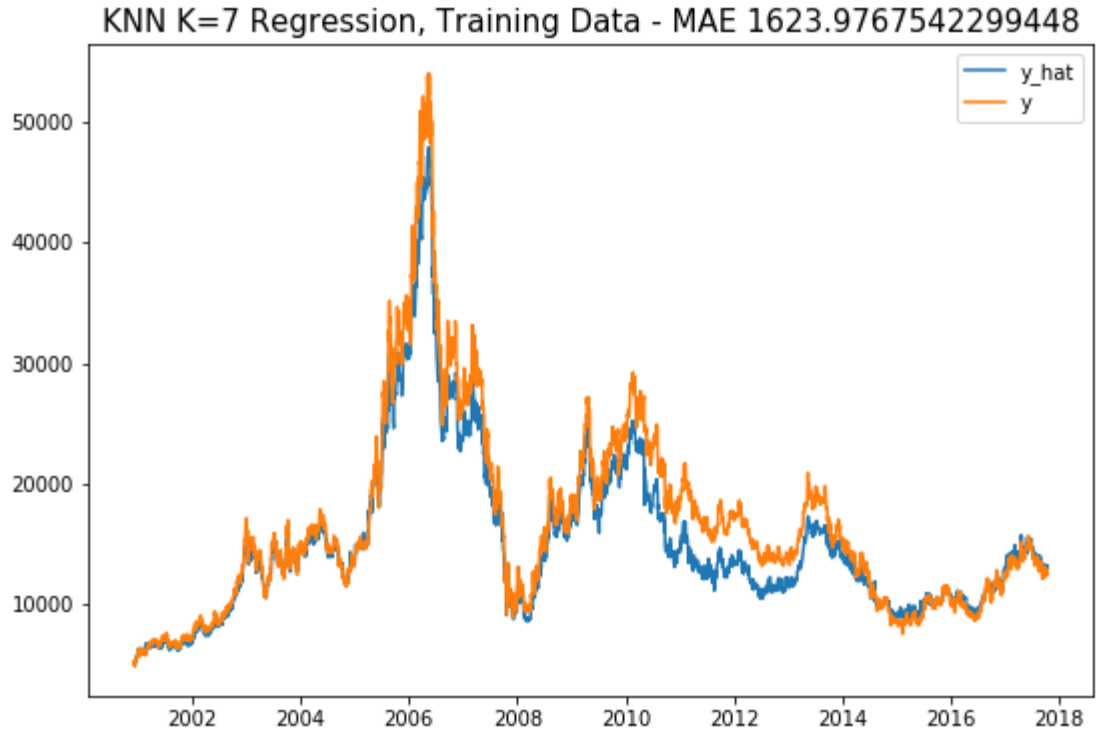
NOTE: window_setting refers to the rolling mean window column in results table

```python
def preprocess(series, window_setting):
    moving_avg = series.rolling(window=window_setting).mean().shift()
    moving_avg_diff = series-moving_avg
    return moving_avg_diff
```

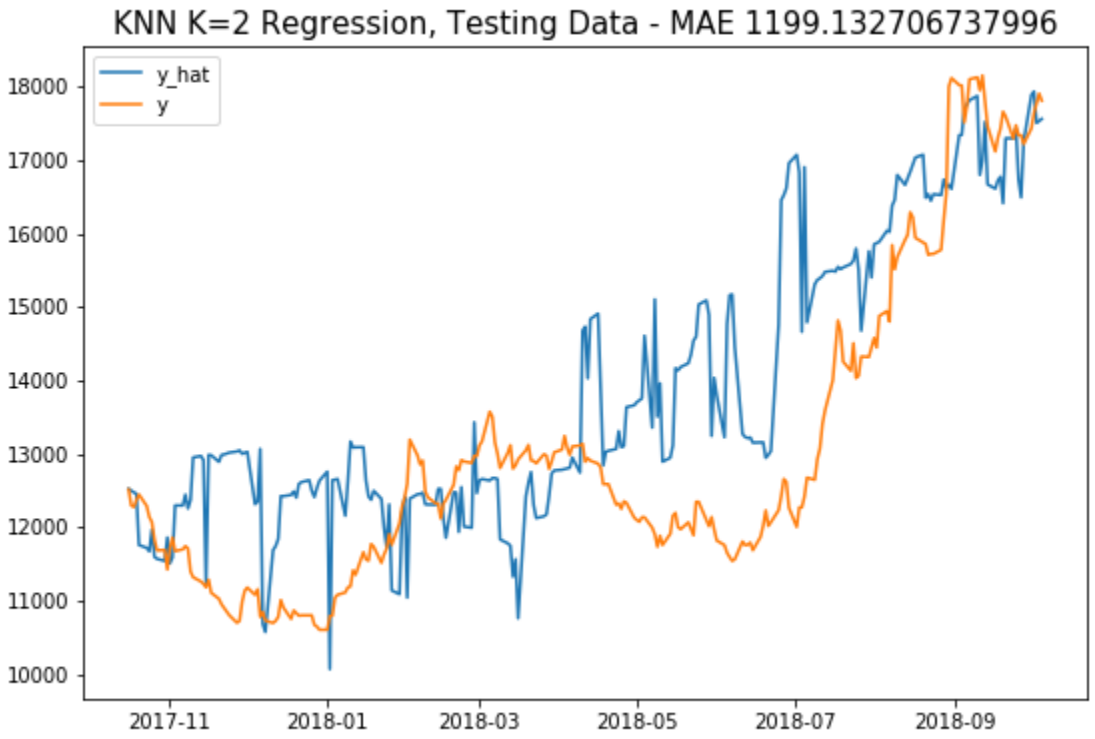
```python
LME_stationary = preprocess(LME, window_setting)

list_one = list(LME_stationary.index)
list_two = list(LME_stationary)
df = pd.DataFrame(list(zip(list_one, list_two)), columns = ['ds', 'lag0'])
df.head()

# How many lag periods? - LAG DAYS
lag_length = 10

df['lag1'] = df.lag0.shift(periods=1*lag_length)
df['lag2'] = df.lag0.shift(periods=2*lag_length)
df['lag3'] = df.lag0.shift(periods=3*lag_length)
df['lag4'] = df.lag0.shift(periods=4*lag_length)
df['lag5'] = df.lag0.shift(periods=5*lag_length)

df['lag6'] = df.lag0.shift(periods=6*lag_length)
df['lag7'] = df.lag0.shift(periods=7*lag_length)
df['lag8'] = df.lag0.shift(periods=8*lag_length)
df['lag9'] = df.lag0.shift(periods=9*lag_length)
df['lag10'] = df.lag0.shift(periods=10*lag_length)

df.index = df['ds']
df = df.iloc[:, 1:]


df['y'] = df['lag0'].shift(-261)
df = df.dropna()
df.head()
```

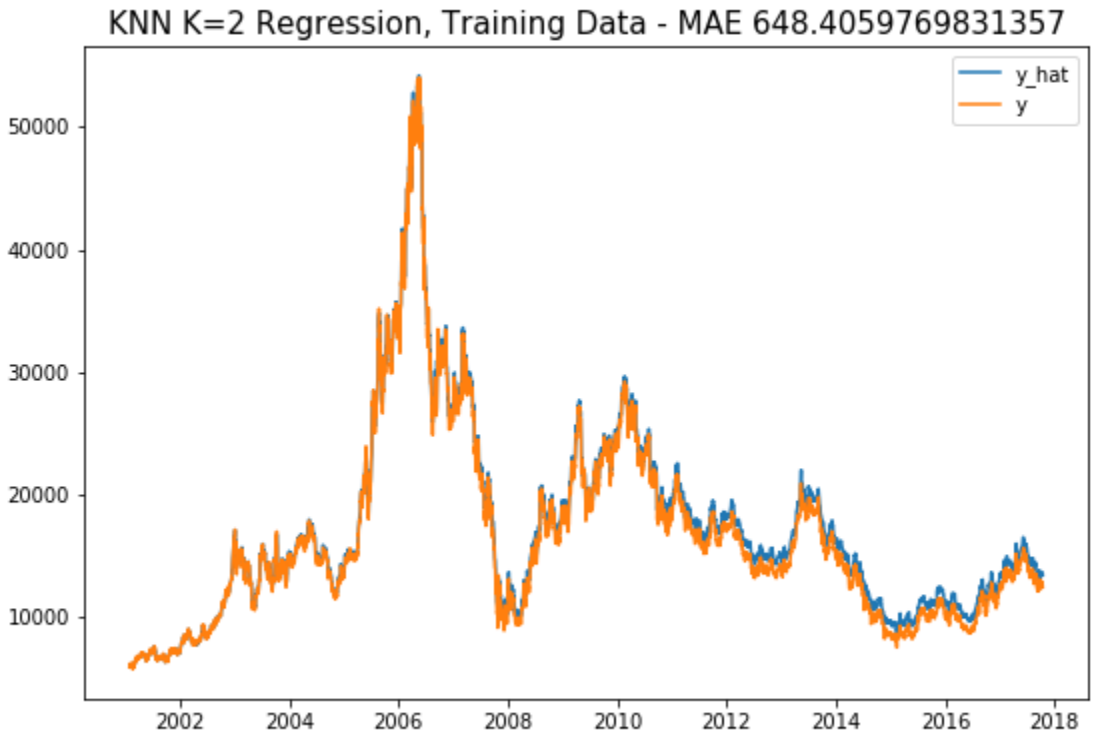
Selected Result Graphs…
Below is graph of 10 lags, lag length = 4 weeks, rolling window length = 4 weeks



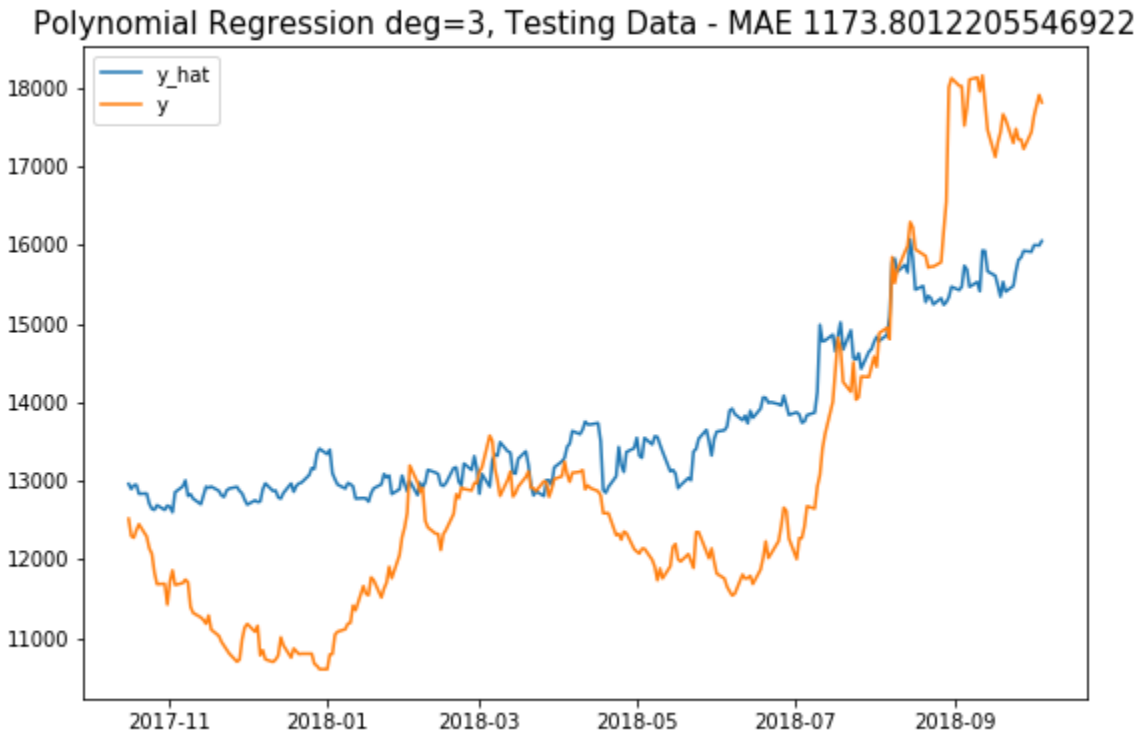


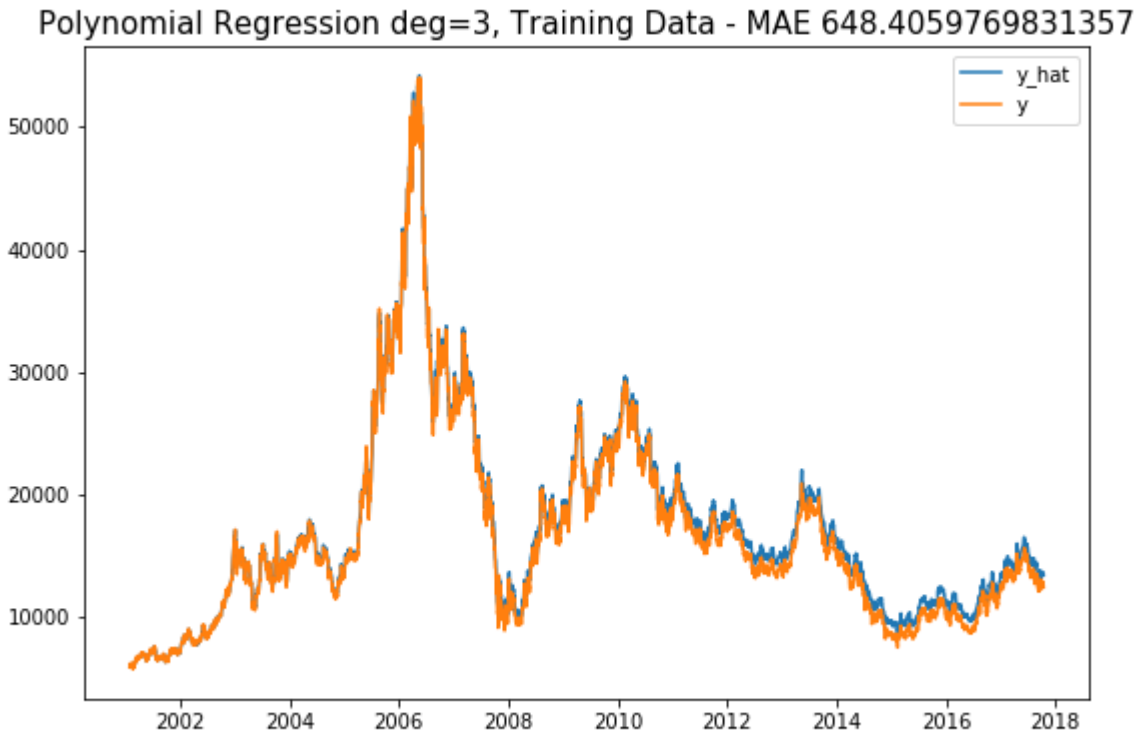
Graph of 10 lags, lag length = 4 weeks, rolling window length = 8 weeks



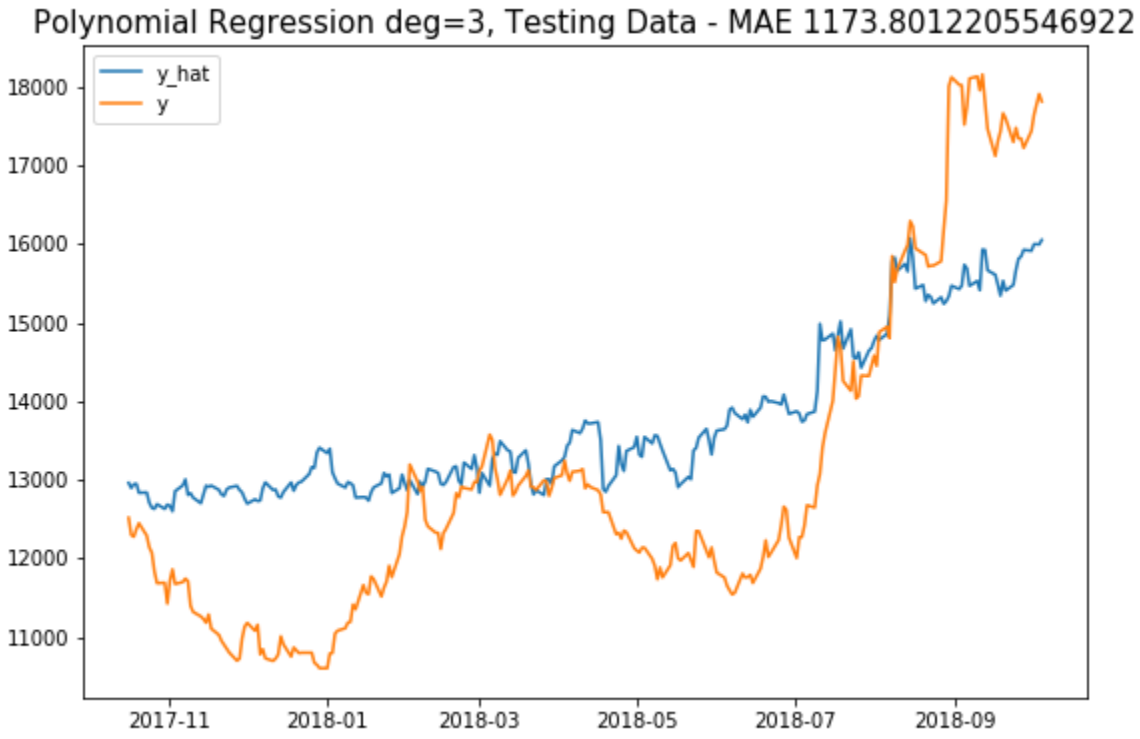


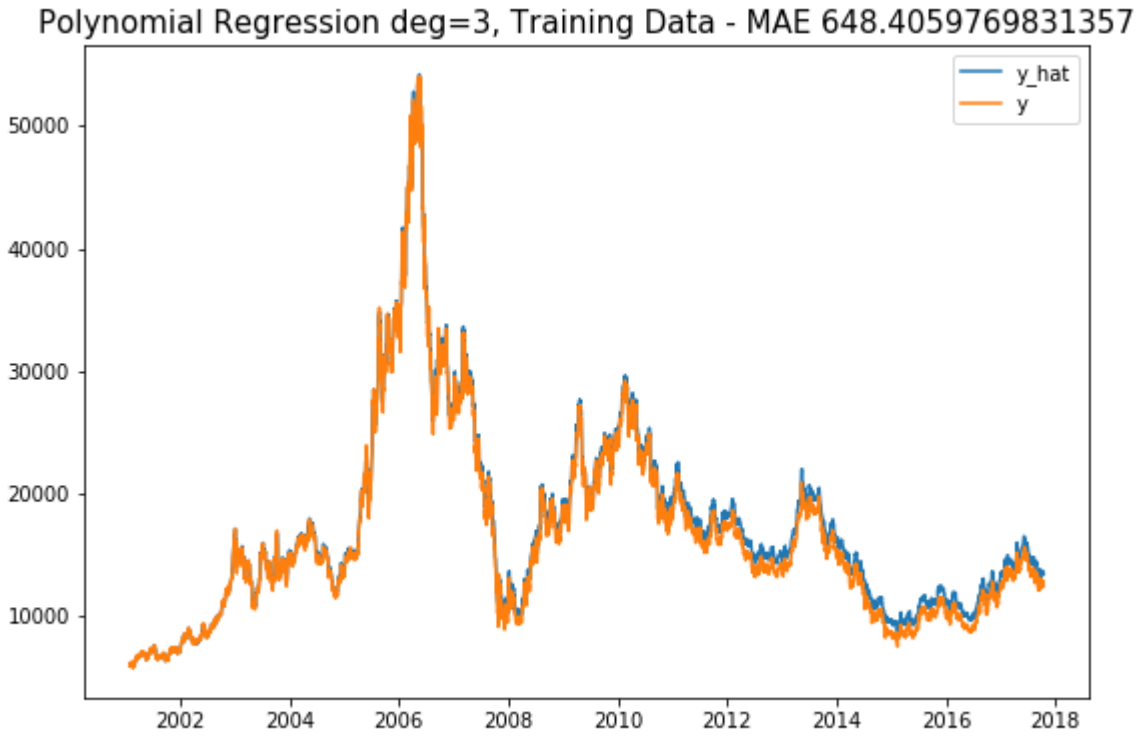
Graph of 10 lags, lag length = 4 weeks, rolling window length = 8 weeks



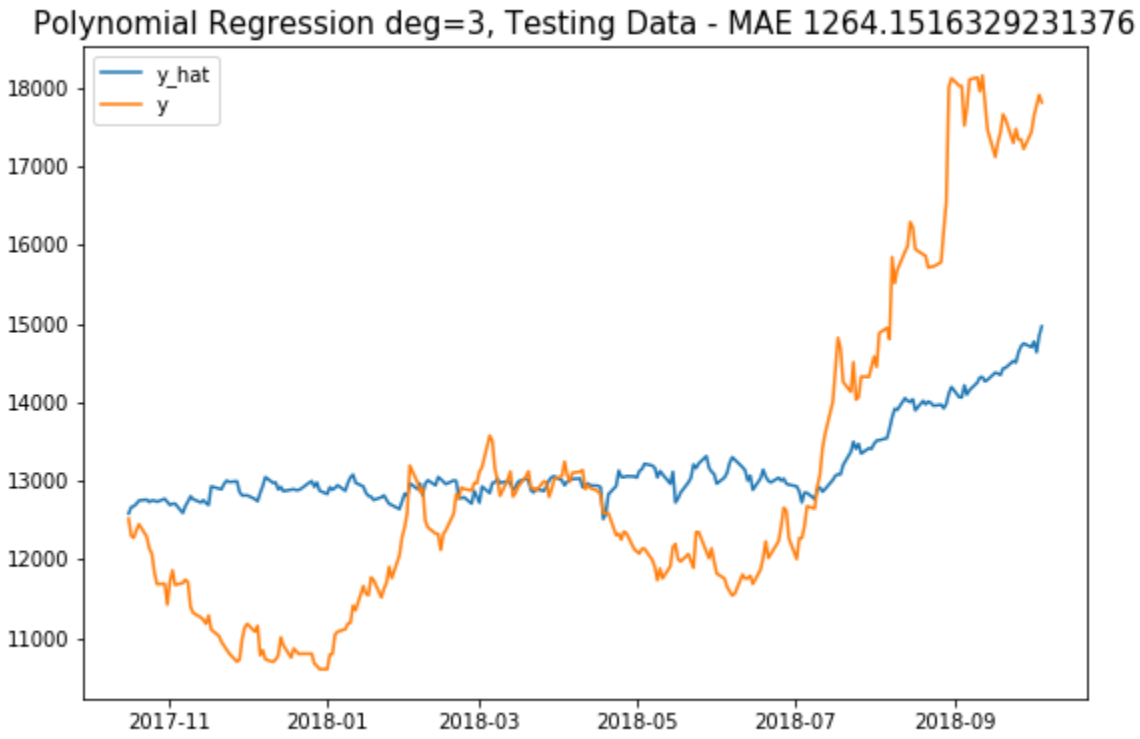


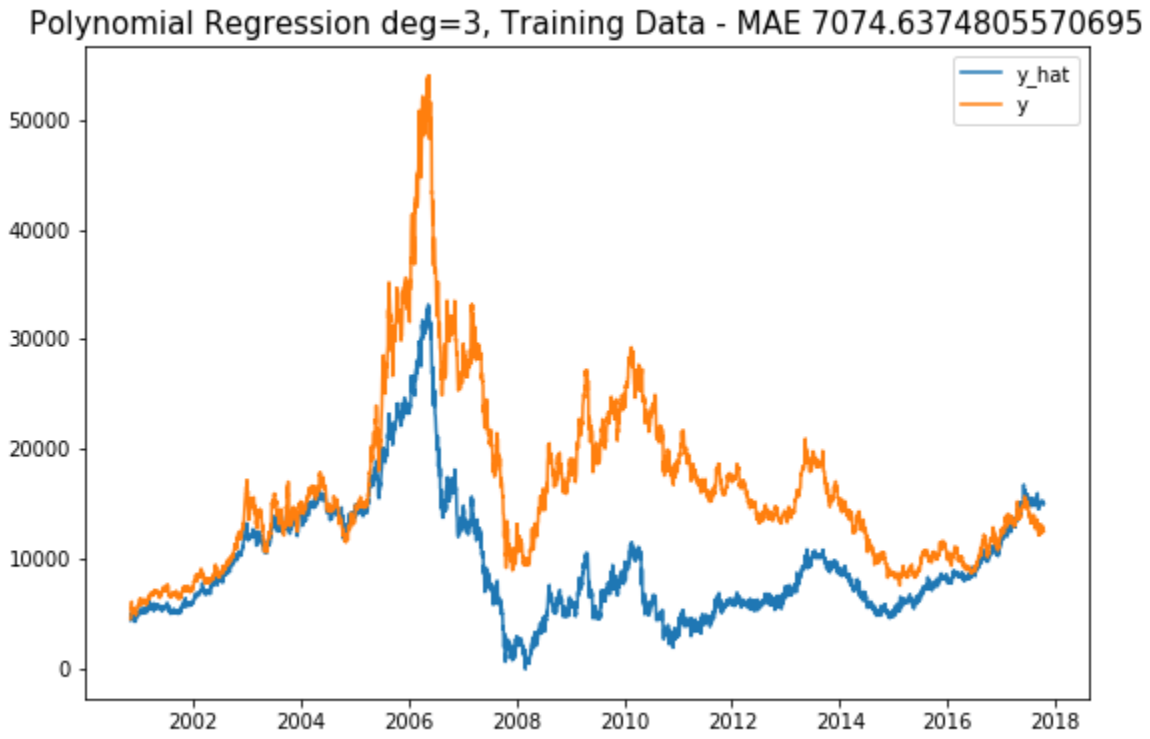
Graph of 10 lags, lag length = 4 weeks, rolling window length = 8 weeks



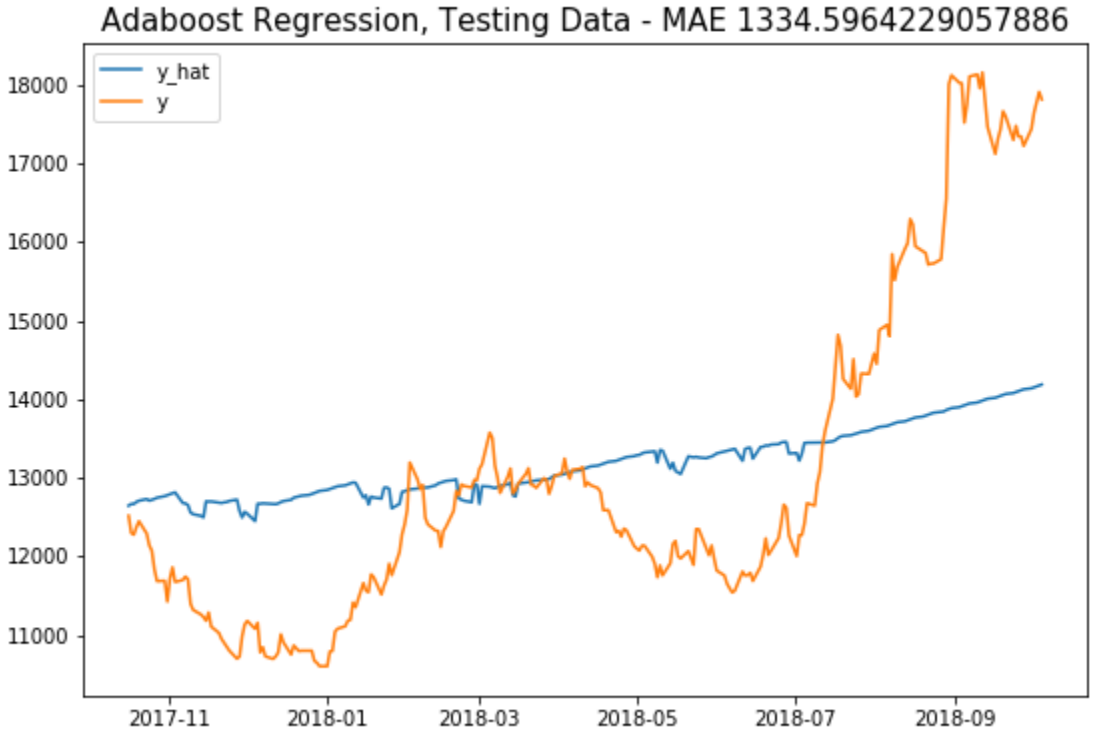


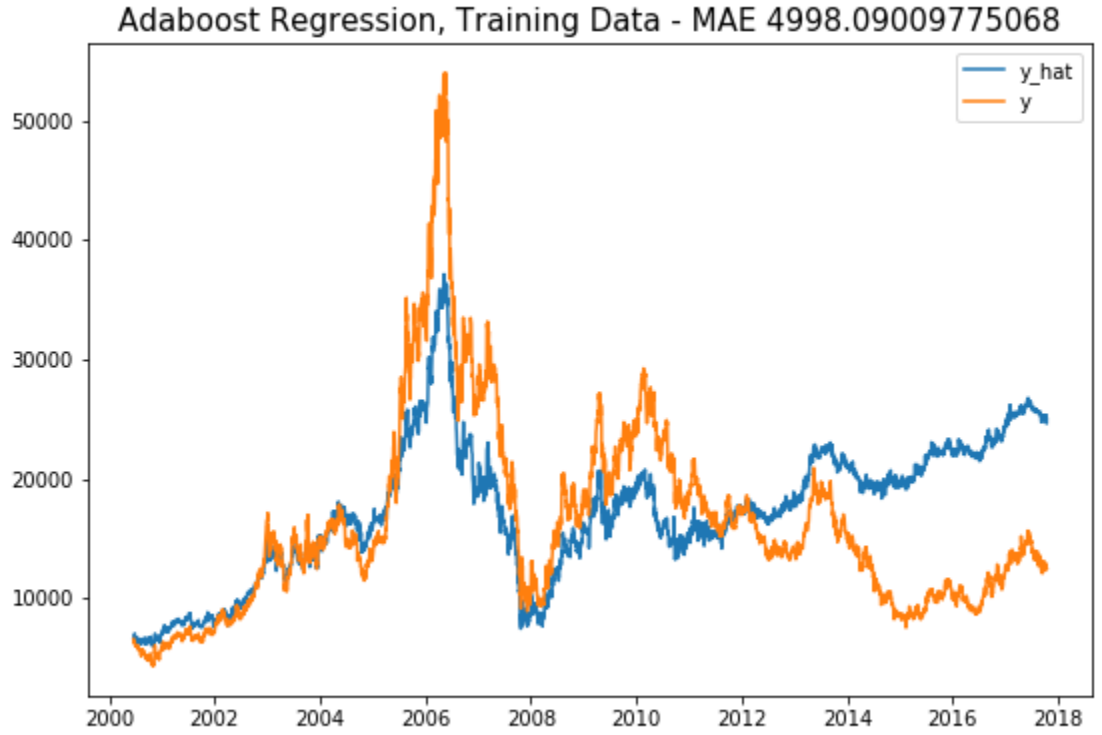
Graph of 10 lags, lag length = 4 weeks, rolling window length = 2 weeks





Graph of 10 lags, lag length = 2 weeks, rolling window length = 2 weeks





Graph of 10 lags, lag length = 4 weeks, rolling window length = 4 weeks