nbf_direct

July 19, 2020

1 Predicting Customer Website Clicks

[1]:
```
# importing libraries
from utilities import *

%matplotlib inline
%load_ext autoreload
%autoreload 2
```

```
Importing plotly failed. Interactive plots will not work.
```

[2]:
```
# file paths
catalogs_file_path = r'data\NBF_Catalogs.xlsx'
direct_file_path = r"data\NBF_Web-Web_Channel_Direct_Search_2010101-20200531.
 ↪xlsx"
```

[3]:
```
# parameters
n_forecast_weeks = 13
freq = "W"
```

[4]:
```
# import catalogs data set
nbf_catalogs_ts = read_catalogs_data(catalogs_file_path, freq)
```

[5]:
```
# import direct data set
nbf_direct_ts = read_clicks_data(direct_file_path, freq)
```

```
--------------------------------------------------------------------------
['(direct)']
```

[6]:
```
# merge catalogs and direct data sets
nbf_catalogs_direct_ts = merge_catalogs_clicks(nbf_catalogs_ts, nbf_direct_ts)
```

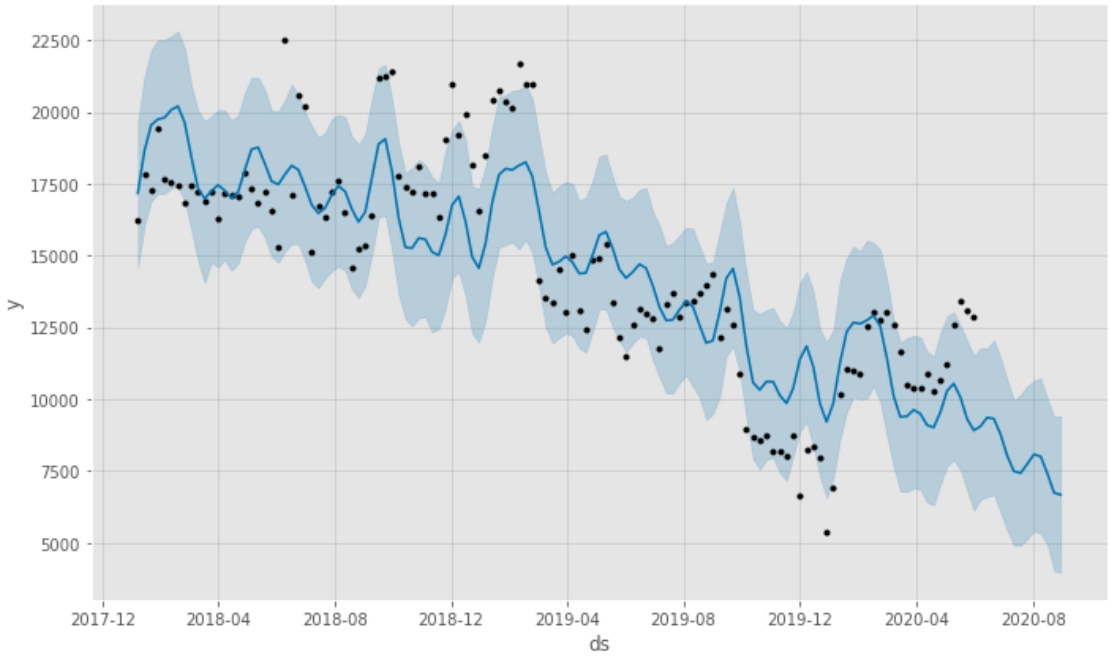
```
--------------------------------------------------------------------------
corr 0.065003745205411
p-value 0.46958247220950977
--------------------------------------------------------------------------
                            OLS Regression Results
```

```
==============================================================================
Dep. Variable:              no_clicks   R-squared:                       0.004
Model:                            OLS   Adj. R-squared:                 -0.004
Method:                 Least Squares   F-statistic:                    0.5262
Date:                Sun, 19 Jul 2020   Prob (F-statistic):              0.470
Time:                        19:09:58   Log-Likelihood:                -1217.8
No. Observations:                 126   AIC:                             2440.
Df Residuals:                     124   BIC:                             2445.
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
Intercept   1.434e+04    585.119     24.513      0.000    1.32e+04    1.55e+04
no_catalogs     0.0020      0.003      0.725      0.470      -0.003       0.007
==============================================================================
Omnibus:                        3.367   Durbin-Watson:                   0.199
Prob(Omnibus):                  0.186   Jarque-Bera (JB):                2.258
Skew:                          -0.130   Prob(JB):                        0.323
Kurtosis:                       2.398   Cond. No.                     3.69e+05
==============================================================================

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly
specified.
[2] The condition number is large, 3.69e+05. This might indicate that there are
strong multicollinearity or other numerical problems.
```

[7]:
```
# make predictions
clicks_ts(nbf_catalogs_direct_ts, n_forecast_weeks, freq)
```

```
----------------------------------------------------------------------
            ds         yhat   yhat_lower    yhat_upper
126 2020-06-07  9058.155267  6511.433307  11786.932041
127 2020-06-14  9362.214064  6599.506134  11777.919614
128 2020-06-21  9321.101005  6680.339694  12056.298331
129 2020-06-28  8783.103288  6057.552933  11439.620039
130 2020-07-05  8029.835961  5425.101796  10674.100343
131 2020-07-12  7493.843796  4913.700550   9960.270185
132 2020-07-19  7428.930510  4912.574209  10167.958366
133 2020-07-26  7750.003733  5138.608811  10471.038232
134 2020-08-02  8082.511942  5414.871527  10661.187630
135 2020-08-09  8007.603179  5321.562038  10727.527548
136 2020-08-16  7421.907424  4933.612393  10012.141760
137 2020-08-23  6746.777256  4030.482630   9395.191100
138 2020-08-30  6675.949221  3962.571053   9425.897230
```


22500
20000
17500
15000
12500
10000
7500
5000
y
2017-12
2018-04
2018-08
2018-12
2019-04
2019-08
2019-12
2020-04
2020-08
ds

[ ]: