Google Analytics Customer Revenue Prediction

February 10, 2019

In [1]:
```
# LOADING MODULES

import os
import json
import numpy as np
import pandas as pd
from pandas.io.json import json_normalize
import matplotlib.pyplot as plt
import seaborn as sns
color = sns.color_palette()

%matplotlib inline

from plotly import tools
import plotly.offline as py
py.init_notebook_mode(connected=True)
import plotly.graph_objs as go

from sklearn import model_selection, preprocessing, metrics
from sklearn.metrics import mean_squared_error, r2_score
from sklearn import datasets, linear_model
from sklearn import svm
from sklearn.tree import DecisionTreeRegressor
from sklearn.neighbors import KNeighborsRegressor
from sklearn.ensemble import RandomForestRegressor
import lightgbm as lgb
import xgboost as xgb

#pd.options.mode.chained_assignment = None
#pd.options.display.max_columns = 999

import seaborn as sns
import matplotlib.pyplot as plt
import statsmodels.formula.api as smf
%matplotlib inline

from pydoc import help
```

```
        from scipy.stats.stats import pearsonr

        from datetime import datetime
        from datetime import timedelta
        import datetime as dt
        import calendar

        import math
```

```
/anaconda3/lib/python3.6/site-packages/lightgbm/__init__.py:46: UserWarning:

Starting from version 2.2.1, the library file in distribution wheels for macOS is built by the
This means that in case of installing LightGBM from PyPI via the ``pip install lightgbm`` comma
Instead of that, you need to install the OpenMP library, which is required for running LightGB
You can install the OpenMP library by the following command: ``brew install libomp``.
```

```
In [ ]: #DELETE
        train_df = pd.read_csv("./processed_train.csv")
        test_df = pd.read_csv("./processed_test.csv")
```

```
In [ ]: #DELETE
        print (train_df.columns)
        print (train_df.dtypes)
```

```
In [ ]: # EXTRACTING FEATURES FROM THE WEATHER DATASET

        external=pd.read_csv("./external_data2.csv")
```

```
In [ ]: print (external.columns)
        external.columns = ['Index', 'geoNetwork_country', 'InternetUsers', 'Population', 'Non
        print (external.columns)
```

```
In [ ]: # MERGING EXISTING DATA WITH WEATHER DATA TO GENERATE NEW FEATURES

        train_new = pd.merge(train_df, external, how='left', on=['geoNetwork_country'])

        print (train_new.columns)
```

```
In [ ]: print (train_new.shape)
        print (train_new.columns)
        print (train_new.dtypes)
```

```
In [ ]: print (train_new.geoNetwork_country.unique())
        #print (train_new.geoNetwork_country.size)
```

```
In [ ]: print (train_df.geoNetwork_country.unique())
```

In [74]:
```
# LOAD DATA

initial_train = pd.read_csv("./train.csv")
initial_test = pd.read_csv("./test.csv")
```

```
/anaconda3/lib/python3.6/site-packages/IPython/core/interactiveshell.py:2785: DtypeWarning:

Columns (3) have mixed types. Specify dtype option on import or set low_memory=False.
```

In [ ]:
```
print (initial_train.shape)
print (initial_test.shape)

print (initial_train.columns)
print (initial_test.columns)

print (initial_train.dtypes)
```

In [2]:
```
# FUNCTION TO EXTRACT JSON VALUES

def load_df(filename):
    csv_path = "./" + filename
    JSON_COLUMNS = ['device', 'geoNetwork', 'totals', 'trafficSource']

    df = pd.read_csv(csv_path,
                     converters={column: json.loads for column in JSON_COLUMNS},
                     dtype={'fullVisitorId': 'str'}
                    )

    for column in JSON_COLUMNS:
        column_as_df = json_normalize(df[column])
        column_as_df.columns = [f"{column}_{subcolumn}" for subcolumn in column_as_df.
        df = df.drop(column, axis=1).merge(column_as_df, right_index=True, left_index=
    return df
```

In [3]:
```
train_df = load_df("train.csv")
test_df = load_df("test.csv")
```

In [ ]:
```
train_full_df = train_df
test_ful_df = test_df
```

In [ ]:
```
print ("TRAIN")
print (train_df.shape)
print (train_df.columns)
print (train_df.dtypes)

print ("TEST")
print (test_df.shape)
```

```
        print (test_df.columns)
        print (test_df.dtypes)
```

In [ ]:
```
train_df.device_browser.unique()
```

In [ ]:
```
train_df.device_browserSize.unique()
```

In [ ]:
```
train_df.device_browserVersion.unique()
```

In [ ]:
```
train_df.device_deviceCategory.unique()
```

In [ ]:
```
train_df.device_flashVersion.unique()
```

In [ ]:
```
train_df.device_isMobile.unique()
```

In [ ]:
```
train_df.device_language.unique()
```

In [ ]:
```
train_df.device_mobileDeviceBranding.unique()
```

In [ ]:
```
train_df.device_mobileDeviceInfo.unique()
```

In [ ]:
```
train_df.device_mobileDeviceMarketingName.unique()
```

In [ ]:
```
train_df.device_mobileDeviceModel.unique()
```

In [ ]:
```
train_df.device_mobileInputSelector.unique()
```

In [ ]:
```
train_df.device_operatingSystem.unique()
```

In [ ]:
```
train_df.device_operatingSystemVersion.unique()
```

In [ ]:
```
train_df.device_screenColors.unique()
```

In [ ]:
```
train_df.device_screenResolution.unique()
```

In [ ]:
```
train_df.geoNetwork_city.unique()
```

In [ ]:
```
train_df.geoNetwork_cityId.unique()
```

In [ ]:
```
train_df.geoNetwork_continent.unique()
```

In [ ]:
```
train_df.geoNetwork_country.unique()
```

In [ ]:
```
train_df.geoNetwork_latitude.unique()
```

In [ ]:
```
train_df.geoNetwork_longitude.unique()
```

In [ ]:
```
train_df.geoNetwork_metro.unique()
```

In [ ]:
```
train_df.geoNetwork_networkDomain.unique()
```

In [ ]:
```
train_df.geoNetwork_networkLocation.unique()
```

```
In [ ]: train_df.geoNetwork_region.unique()

In [ ]: train_df.geoNetwork_subContinent.unique()

In [ ]: train_df.totals_bounces.unique()

In [ ]: train_df.totals_hits.unique()

In [ ]: train_df.totals_newVisits.unique()

In [ ]: train_df.totals_pageviews.unique()

In [ ]: train_df.totals_visits.unique()

In [ ]: train_df.trafficSource_adContent.unique()

In [ ]: train_df.trafficSource_adwordsClickInfo.adNetworkType.unique()

In [ ]: train_df.trafficSource_adwordsClickInfo_criteriaParameters.unique()

In [ ]: train_df.trafficSource_adwordsClickInfo_gclId.unique()

In [ ]: train_df.trafficSource_adwordsClickInfo_isVideoAd.unique()

In [ ]: train_df.trafficSource_adwordsClickInfo_page.unique()

In [ ]: train_df.trafficSource_adwordsClickInfo_slot.unique()

In [ ]: train_df.trafficSource_campaign.unique()

In [ ]: train_df.trafficSource_isTrueDirect.unique()

In [ ]: train_df.trafficSource_keyword.unique()

In [ ]: train_df.trafficSource_medium.unique()

In [ ]: train_df.trafficSource_referralPath.unique()

In [ ]: train_df.trafficSource_source.unique()

In [4]: # CONVERTING TRANSACTION REVENUE TO FLOAT

        train_df["totals_transactionRevenue"] = train_df["totals_transactionRevenue"].astype('

In [ ]: nzi = pd.notnull(train_df["totals_transactionRevenue"]).sum()
        nzr = (gdf["totals_transactionRevenue"]>0).sum()
        print("Number of instances in train set with non-zero revenue : ", nzi, " and ratio is
        print("Number of unique customers with non-zero revenue : ", nzr, "and the ratio is : '

In [ ]: print("Number of unique visitors in train set : ",train_df.fullVisitorId.nunique(), " d
        print("Number of unique visitors in test set : ",test_df.fullVisitorId.nunique(), " out
        print("Number of common visitors in train and test set : ",len(set(train_df.fullVisitor
```

```
In [ ]: #VERIFY
        gdf = train_df.groupby("fullVisitorId")["totals_transactionRevenue"].sum().reset_index
        print (gdf.columns)

        plt.figure(figsize=(8,6))
        plt.scatter(range(gdf.shape[0]), np.sort(np.log1p(gdf["totals_transactionRevenue"].valu
        plt.xlabel('index', fontsize=12)
        plt.ylabel('TransactionRevenue', fontsize=12)
        plt.show()

In [ ]: #VERIFY
        plt.figure(figsize=(8,6))
        sns.distplot(np.log1p(non_zero))
        plt.title("Log Distribution of Non Zero Total Transactions");
        plt.xlabel("Log - Total Transactions");

In [ ]: # DEVICE ATTRIBUTES

In [13]: fig1 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: Device Category", '

         trs1 = []

         tmp1 = train_df.groupby('device_deviceCategory').agg({"totals_transactionRevenue": "si
         tmp1 = tmp1.dropna().sort_values("Count", ascending = False)
         tr1 = go.Bar(y = tmp1["Count"], orientation="v", marker=dict(opacity=0.5, color="blue'
         trs1.append(tr1)

         tmp1 = train_df.groupby('device_deviceCategory').agg({"totals_transactionRevenue": "co
         tmp1 = tmp1.dropna().sort_values("Non-zero Revenue Count", ascending = False)
         tr1 = go.Bar(y = tmp1["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
         trs1.append(tr1)

         fig1.append_trace(trs1[0], 1, 1)
         fig1.append_trace(trs1[1], 1, 2)
         fig1['layout'].update(height=450, margin=dict(b=200), showlegend=False)
         py.iplot(fig1)

         fig2 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: Device OperatingSys

         trs2 = []

         tmp2 = train_df.groupby('device_operatingSystem').agg({"totals_transactionRevenue": "s
         tmp2 = tmp2.dropna().sort_values("Count", ascending = False)
         tr2 = go.Bar(y = tmp2["Count"], orientation="v", marker=dict(opacity=0.5, color="orang
         trs2.append(tr2)

         tmp2 = train_df.groupby('device_operatingSystem').agg({"totals_transactionRevenue": "c
         tmp2 = tmp2.dropna().sort_values("Non-zero Revenue Count", ascending = False)
```

```
        tr2 = go.Bar(y = tmp2["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
        trs2.append(tr2)

        fig2.append_trace(trs2[0], 1, 1)
        fig2.append_trace(trs2[1], 1, 2)
        fig2['layout'].update(height=450, margin=dict(b=200), showlegend=False)
        py.iplot(fig2)
```

In [11]:
```
        #GEOGRAPHY ATTRIBUTES

        fig1 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: Continent", "Non-ze

        trs1 = []

        tmp1 = train_df.groupby('geoNetwork_continent').agg({"totals_transactionRevenue": "siz
        tmp1 = tmp1.dropna().sort_values("Count", ascending = False)
        tr1 = go.Bar(y = tmp1["Count"], orientation="v", marker=dict(opacity=0.5, color="blue"
        trs1.append(tr1)

        tmp1 = train_df.groupby('geoNetwork_continent').agg({"totals_transactionRevenue": "cou
        tmp1 = tmp1.dropna().sort_values("Non-zero Revenue Count", ascending = False)
        tr1 = go.Bar(y = tmp1["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
        trs1.append(tr1)

        fig1.append_trace(trs1[0], 1, 1)
        fig1.append_trace(trs1[1], 1, 2)
        fig1['layout'].update(height=450, margin=dict(b=200), showlegend=False)
        py.iplot(fig1)

        fig2 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: SubContinent", "Non

        trs2 = []

        tmp2 = train_df.groupby('geoNetwork_subContinent').agg({"totals_transactionRevenue": '
        tmp2 = tmp2.dropna().sort_values("Count", ascending = False)
        tr2 = go.Bar(y = tmp2["Count"], orientation="v", marker=dict(opacity=0.5, color="orang
        trs2.append(tr2)

        tmp2 = train_df.groupby('geoNetwork_subContinent').agg({"totals_transactionRevenue": '
        tmp2 = tmp2.dropna().sort_values("Non-zero Revenue Count", ascending = False)
        tr2 = go.Bar(y = tmp2["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
        trs2.append(tr2)

        fig2.append_trace(trs2[0], 1, 1)
        fig2.append_trace(trs2[1], 1, 2)
        fig2['layout'].update(height=450, margin=dict(b=200), showlegend=False)
        py.iplot(fig2)
```

In [16]:
```
        def date_parser(df):
```

```
    df['date'] = pd.to_datetime(df['date'].astype(str))
    df['visitStartTime'] = pd.to_datetime(df['visitStartTime'], unit = 's')
    return df

train_df = date_parser(train_df)
test_df = date_parser(test_df)

def add_time_features(df):
    df['dayofweek'] = df['visitStartTime'].dt.dayofweek
    df['hour'] = df['visitStartTime'].dt.hour
    df['month'] = df['visitStartTime'].dt.month
    df[['dayofweek','hour','month']] = df[['dayofweek','hour','month']].apply(lambda x
    return df

train_df = add_time_features(train_df)
test_df = add_time_features(test_df)
```

In [23]:
```
#DATE ATTRIBUTES

fig1 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: Hour", "Non-zero Re

trs1 = []

tmp1 = train_df.groupby('hour').agg({"totals_transactionRevenue": "size"}).reset_index
tmp1 = tmp1.dropna().sort_values("Count", ascending = False)
tr1 = go.Bar(y = tmp1["Count"], orientation="v", marker=dict(opacity=0.5, color="blue"
trs1.append(tr1)

tmp1 = train_df.groupby('hour').agg({"totals_transactionRevenue": "count"}).reset_inde
tmp1 = tmp1.dropna().sort_values("Non-zero Revenue Count", ascending = False)
tr1 = go.Bar(y = tmp1["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
trs1.append(tr1)

fig1.append_trace(trs1[0], 1, 1)
fig1.append_trace(trs1[1], 1, 2)
fig1['layout'].update(height=450, margin=dict(b=200), showlegend=False)
py.iplot(fig1)

fig2 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: Day of Week", "Non-

trs2 = []

tmp2 = train_df.groupby('dayofweek').agg({"totals_transactionRevenue": "size"}).reset_
tmp2 = tmp2.dropna().sort_values("Count", ascending = False)
tr2 = go.Bar(y = tmp2["Count"], orientation="v", marker=dict(opacity=0.5, color="orang
trs2.append(tr2)

tmp2 = train_df.groupby('dayofweek').agg({"totals_transactionRevenue": "count"}).reset
```

```
tmp2 = tmp2.dropna().sort_values("Non-zero Revenue Count", ascending = False)
tr2 = go.Bar(y = tmp2["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
trs2.append(tr2)

fig2.append_trace(trs2[0], 1, 1)
fig2.append_trace(trs2[1], 1, 2)
fig2['layout'].update(height=450, margin=dict(b=200), showlegend=False)
py.iplot(fig2)

fig3 = tools.make_subplots(rows=1, cols=2, subplot_titles=["Count: Month", "Non-zero R

trs3 = []

tmp3 = train_df.groupby('month').agg({"totals_transactionRevenue": "size"}).reset_inde
tmp3 = tmp3.dropna().sort_values("Count", ascending = False)
tr3 = go.Bar(y = tmp3["Count"], orientation="v", marker=dict(opacity=0.5, color="cyan"
trs3.append(tr3)

tmp3 = train_df.groupby('month').agg({"totals_transactionRevenue": "count"}).reset_ind
tmp3 = tmp3.dropna().sort_values("Non-zero Revenue Count", ascending = False)
tr3 = go.Bar(y = tmp3["Non-zero Revenue Count"], orientation="v", marker=dict(opacity=
trs3.append(tr3)

fig3.append_trace(trs3[0], 1, 1)
fig3.append_trace(trs3[1], 1, 2)
fig3['layout'].update(height=450, margin=dict(b=200), showlegend=False)
py.iplot(fig3)
```

In [69]:
```
tmp = train_df["channelGrouping"].value_counts()
colors = ["#8d44fc", "#ed95d5", "#caadf7", "#6161b7", "#7e7eba", "#babad1"]
trace = go.Pie(labels=tmp.index, values=tmp.values, marker=dict(colors=colors))
layout = go.Layout(title="Channel Grouping", height=400)
fig = go.Figure(data = [trace], layout = layout)
py.iplot(fig, filename='basic_pie_chart')
```

In [24]:
```
# Probability

cnt_srs1 = train_df.groupby('fullVisitorId')['totals_transactionRevenue'].agg(['size'
cnt_srs1.columns = ["count", "count of non-zero revenue", "mean"]
cnt_srs1 = cnt_srs1.sort_values(by="count", ascending=False)
```

In [25]:
```
print (cnt_srs1.shape)
print (cnt_srs1.min())
print (cnt_srs1.max())
```

```
(714167, 3)
count                         1.0
count of non-zero revenue     0.0
mean                      10000.0
```

```
dtype: float64
count                          2.780000e+02
count of non-zero revenue      3.300000e+01
mean                           1.602375e+10
dtype: float64
```

```
In [26]: prob1 = cnt_srs1
         prob1.shape

Out[26]: (714167, 3)

In [27]: prob1["probability"] = cnt_srs1['count of non-zero revenue']/cnt_srs1['count']
         #prob["count"] = cnt_srs['count']
         #prob["count of non-zero revenue"] = cnt_srs['count of non-zero revenue']

In [28]: print (prob1.shape)
         print (prob1.columns)
         print (prob1.head(10))
```

```
(714167, 4)
Index(['count', 'count of non-zero revenue', 'mean', 'probability'], dtype='object')
                     count  count of non-zero revenue          mean  \
fullVisitorId
1957458976293878100    278                         16  4.819589e+09
0824839726118485274    255                          0           NaN
3608475193341679870    201                          1  2.348000e+07
1856749147915772585    199                          0           NaN
3269834865385146569    155                          1  1.799000e+08
0720311197761340948    153                          0           NaN
7634897085866546110    148                          1  2.500000e+07
4038076683036146727    138                          0           NaN
0232377434237234751    135                          1  1.798000e+07
3694234028523165868    129                          1  1.519000e+07

                     probability
fullVisitorId
1957458976293878100     0.057554
0824839726118485274     0.000000
3608475193341679870     0.004975
1856749147915772585     0.000000
3269834865385146569     0.006452
0720311197761340948     0.000000
7634897085866546110     0.006757
4038076683036146727     0.000000
0232377434237234751     0.007407
3694234028523165868     0.007752
```

```
In [29]: prob1 = prob1.sort_values(by="probability", ascending=False)

In [72]: prob_high = prob1[prob1['count'] > 6]

In [73]: print (prob_high.shape)
         print (prob_high.columns)
         print (prob_high.head(10))

(4524, 4)
Index(['count', 'count of non-zero revenue', 'mean', 'probability'], dtype='object')
                     count  count of non-zero revenue          mean  \
fullVisitorId
0608915197735218105     17                         13  2.335615e+08
803888563485194008       7                          5  4.990000e+07
3818637526754889697      7                          5  1.044740e+08
4984366501121503466     24                         16  5.946188e+08
3857043812510146001      9                          6  8.878500e+07
2411322974724385937     11                          7  2.970000e+07
0777922178356486144     10                          6  5.311667e+07
8657427332734176422     10                          6  1.259100e+08
5263059809967138936      7                          4  1.460800e+08
3033366073043100694      7                          4  1.655350e+08

                     probability
fullVisitorId
0608915197735218105     0.764706
803888563485194008      0.714286
3818637526754889697     0.714286
4984366501121503466     0.666667
3857043812510146001     0.666667
2411322974724385937     0.636364
0777922178356486144     0.600000
8657427332734176422     0.600000
5263059809967138936     0.571429
3033366073043100694     0.571429


In [32]: print (prob1.shape)
         print (prob1.columns)
         print (prob1.head(10))

(714167, 4)
Index(['count', 'count of non-zero revenue', 'mean', 'probability'], dtype='object')
                     count  count of non-zero revenue         mean  \
fullVisitorId
0037806222406366969      1                          1   16990000.0
9507736163898888702      1                          1   40770000.0
647109355709882719       1                          1   12990000.0
3193356620853190867      1                          1   12990000.0
```

```
6298030765010140996      1                          1   27980000.0
0415608676546432559      1                          1  118980000.0
1706545499690432606      1                          1   44480000.0
7647399051164881931      1                          1   86380000.0
582674888457699636       2                          2   56185000.0
6997840417339284915      1                          1   24990000.0

                     probability
fullVisitorId
0037806222406366969          1.0
9507736163898888702          1.0
647109355709882719           1.0
3193356620853190867          1.0
6298030765010140996          1.0
0415608676546432559          1.0
1706545499690432606          1.0
7647399051164881931          1.0
582674888457699636           1.0
6997840417339284915          1.0
```

```
In [ ]: actual_prob = train_df.groupby('fullVisitorId')['totals_transactionRevenue'].agg(['size
```

```
In [ ]: print (actual_prob.shape)
        print (actual_prob.columns)
        print (actual_prob.head(10))
```

```
In [ ]: pref_df = pd.DataFrame({"fullVisitorId":train_df["fullVisitorId"].values})
        pred_df['transactionRevenue'] = train_df['totals_transactionRevenue'].values
        pred_df['count'] = actual_prob['count']
```

```
In [ ]: print (pref_df.shape)
        print (pref_df.columns)
        print (pref_df.head(10))
```

```
In [ ]: train_prob["probability"] = cnt_srs['count of non-zero revenue']/cnt_srs['count']
        train_prob["count"] = cnt_srs['count']
        train_prob["count of non-zero revenue"] = cnt_srs['count of non-zero revenue']
```

```
In [ ]: train_prob.shape
```

```
In [ ]: train_prob.columns = ["probability", "count of non-zero revenue", "mean"]
```

```
In [33]: print("Variables not in test but in train : ", set(train_df.columns).difference(set(te
```

```
Variables not in test but in train :  {'trafficSource_campaignCode', 'totals_transactionRevenue
```

```
In [35]: const_cols = [c for c in train_df.columns if train_df[c].nunique(dropna=False)==1 ]
         const_cols
```

```
Out[35]: ['socialEngagementType',
          'device_browserSize',
          'device_browserVersion',
          'device_flashVersion',
          'device_language',
          'device_mobileDeviceBranding',
          'device_mobileDeviceInfo',
          'device_mobileDeviceMarketingName',
          'device_mobileDeviceModel',
          'device_mobileInputSelector',
          'device_operatingSystemVersion',
          'device_screenColors',
          'device_screenResolution',
          'geoNetwork_cityId',
          'geoNetwork_latitude',
          'geoNetwork_longitude',
          'geoNetwork_networkLocation',
          'totals_visits',
          'trafficSource_adwordsClickInfo.criteriaParameters']

In [36]: cols_to_drop = const_cols + ['sessionId']

         train_df = train_df.drop(cols_to_drop + ["trafficSource_campaignCode"], axis=1)
         test_df = test_df.drop(cols_to_drop, axis=1)

In [37]: print ("TRAIN")
         print (train_df.shape)
         print (train_df.columns)
         print (train_df.dtypes)

         print ("TEST")
         print (test_df.shape)
         print (test_df.columns)
         print (test_df.dtypes)

TRAIN
(903653, 37)
Index(['channelGrouping', 'date', 'fullVisitorId', 'visitId', 'visitNumber',
       'visitStartTime', 'device_browser', 'device_deviceCategory',
       'device_isMobile', 'device_operatingSystem', 'geoNetwork_city',
       'geoNetwork_continent', 'geoNetwork_country', 'geoNetwork_metro',
       'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'totals_transactionRevenue',
       'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
```

```
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
channelGrouping                                    object
date                                         datetime64[ns]
fullVisitorId                                      object
visitId                                             int64
visitNumber                                         int64
visitStartTime                               datetime64[ns]
device_browser                                     object
device_deviceCategory                              object
device_isMobile                                      bool
device_operatingSystem                             object
geoNetwork_city                                    object
geoNetwork_continent                               object
geoNetwork_country                                 object
geoNetwork_metro                                   object
geoNetwork_networkDomain                           object
geoNetwork_region                                  object
geoNetwork_subContinent                            object
totals_bounces                                     object
totals_hits                                        object
totals_newVisits                                   object
totals_pageviews                                   object
totals_transactionRevenue                         float64
trafficSource_adContent                            object
trafficSource_adwordsClickInfo.adNetworkType       object
trafficSource_adwordsClickInfo.gclId               object
trafficSource_adwordsClickInfo.isVideoAd           object
trafficSource_adwordsClickInfo.page                object
trafficSource_adwordsClickInfo.slot                object
trafficSource_campaign                             object
trafficSource_isTrueDirect                         object
trafficSource_keyword                              object
trafficSource_medium                               object
trafficSource_referralPath                         object
trafficSource_source                               object
dayofweek                                         float64
hour                                              float64
month                                             float64
dtype: object
TEST
(804684, 36)
Index(['channelGrouping', 'date', 'fullVisitorId', 'visitId', 'visitNumber',
       'visitStartTime', 'device_browser', 'device_deviceCategory',
```

```
       'device_isMobile', 'device_operatingSystem', 'geoNetwork_city',
       'geoNetwork_continent', 'geoNetwork_country', 'geoNetwork_metro',
       'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
channelGrouping                                    object
date                                       datetime64[ns]
fullVisitorId                                      object
visitId                                             int64
visitNumber                                         int64
visitStartTime                             datetime64[ns]
device_browser                                     object
device_deviceCategory                              object
device_isMobile                                      bool
device_operatingSystem                             object
geoNetwork_city                                    object
geoNetwork_continent                               object
geoNetwork_country                                 object
geoNetwork_metro                                   object
geoNetwork_networkDomain                           object
geoNetwork_region                                  object
geoNetwork_subContinent                            object
totals_bounces                                     object
totals_hits                                        object
totals_newVisits                                   object
totals_pageviews                                   object
trafficSource_adContent                            object
trafficSource_adwordsClickInfo.adNetworkType       object
trafficSource_adwordsClickInfo.gclId               object
trafficSource_adwordsClickInfo.isVideoAd           object
trafficSource_adwordsClickInfo.page                object
trafficSource_adwordsClickInfo.slot                object
trafficSource_campaign                             object
trafficSource_isTrueDirect                         object
trafficSource_keyword                              object
trafficSource_medium                               object
trafficSource_referralPath                         object
trafficSource_source                               object
dayofweek                                         float64
```

```
hour                                                    float64
month                                                   float64
dtype: object
```

```
In [39]: #MAPPING STRING VALUES TO INTEGERS
         from sklearn import model_selection, preprocessing, metrics

         # Impute 0 for missing target values
         train_df["totals_transactionRevenue"].fillna(0, inplace=True)
         train_y = train_df["totals_transactionRevenue"].values
         train_id = train_df["fullVisitorId"].values
         test_id = test_df["fullVisitorId"].values


         # label encode the categorical variables and convert the numerical variables to float
         cat_cols = ["channelGrouping", "device_browser",
                     "device_deviceCategory", "device_operatingSystem",
                     "geoNetwork_city", "geoNetwork_continent",
                     "geoNetwork_country", "geoNetwork_metro",
                     "geoNetwork_networkDomain", "geoNetwork_region",
                     "geoNetwork_subContinent", "trafficSource_adContent",
                     "trafficSource_adwordsClickInfo.adNetworkType",
                     "trafficSource_adwordsClickInfo.gclId",
                     "trafficSource_adwordsClickInfo.page",
                     "trafficSource_adwordsClickInfo.slot", "trafficSource_campaign",
                     "trafficSource_keyword", "trafficSource_medium",
                     "trafficSource_referralPath", "trafficSource_source",
                     'trafficSource_adwordsClickInfo.isVideoAd', 'trafficSource_isTrueDirect']

         for col in cat_cols:
             print(col)
             lbl = preprocessing.LabelEncoder()
             lbl.fit(list(train_df[col].values.astype('str')) + list(test_df[col].values.astype
             train_df[col] = lbl.transform(list(train_df[col].values.astype('str')))
             test_df[col] = lbl.transform(list(test_df[col].values.astype('str')))
```

```
channelGrouping
device_browser
device_deviceCategory
device_operatingSystem
geoNetwork_city
geoNetwork_continent
geoNetwork_country
geoNetwork_metro
geoNetwork_networkDomain
geoNetwork_region
geoNetwork_subContinent
```

```
trafficSource_adContent
trafficSource_adwordsClickInfo.adNetworkType
trafficSource_adwordsClickInfo.gclId
trafficSource_adwordsClickInfo.page
trafficSource_adwordsClickInfo.slot
trafficSource_campaign
trafficSource_keyword
trafficSource_medium
trafficSource_referralPath
trafficSource_source
trafficSource_adwordsClickInfo.isVideoAd
trafficSource_isTrueDirect
```

In [ ]:
```
#EXTERNAL DATA FROM STRINGS TO INTEGERS
from sklearn import model_selection, preprocessing, metrics

# Impute 0 for missing target values
train_new["totals_transactionRevenue"].fillna(0, inplace=True)
train_y = train_new["totals_transactionRevenue"].values
train_id = train_new["fullVisitorId"].values
test_id = test_df["fullVisitorId"].values


# label encode the categorical variables and convert the numerical variables to float
cat_cols = ["channelGrouping", "device_browser",
            "device_deviceCategory", "device_operatingSystem",
            "geoNetwork_city", "geoNetwork_continent",
            "geoNetwork_country", "geoNetwork_metro",
            "geoNetwork_networkDomain", "geoNetwork_region",
            "geoNetwork_subContinent", "trafficSource_adContent",
            "trafficSource_adwordsClickInfo.adNetworkType",
            "trafficSource_adwordsClickInfo.gclId",
            "trafficSource_adwordsClickInfo.page",
            "trafficSource_adwordsClickInfo.slot", "trafficSource_campaign",
            "trafficSource_keyword", "trafficSource_medium",
            "trafficSource_referralPath", "trafficSource_source",
            'trafficSource_adwordsClickInfo.isVideoAd', 'trafficSource_isTrueDirect']

for col in cat_cols:
    print(col)
    lbl = preprocessing.LabelEncoder()
    lbl.fit(list(train_new[col].values.astype('str')) + list(test_df[col].values.astype
    train_new[col] = lbl.transform(list(train_new[col].values.astype('str')))
    test_df[col] = lbl.transform(list(test_df[col].values.astype('str')))
```

In [46]:
```
#CONVERTING OBJECT TO FLOAT
print (train_df.columns)
```

```
        num_cols = ["totals_hits", "totals_pageviews", "visitNumber", "totals_bounces",  "tota

        for col in num_cols:
            train_df[col] = train_df[col].astype(float)
            test_df[col] = test_df[col].astype(float)
```

```
Index(['channelGrouping', 'date', 'fullVisitorId', 'visitId', 'visitNumber',
       'visitStartTime', 'device_browser', 'device_deviceCategory',
       'device_isMobile', 'device_operatingSystem', 'geoNetwork_city',
       'geoNetwork_continent', 'geoNetwork_country', 'geoNetwork_metro',
       'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'totals_transactionRevenue',
       'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
```

In [ ]:
```
#SPLITTING DATA BASED ON DATE
import datetime

# Split the train dataset into development and valid based on time
dev_df = train_df[train_df['date']<=datetime.date(2017,5,31)]
val_df = train_df[train_df['date']>datetime.date(2017,5,31)]
dev_y = np.log1p(dev_df["totals_transactionRevenue"].values)
val_y = np.log1p(val_df["totals_transactionRevenue"].values)

dev_X = dev_df[cat_cols + num_cols]
val_X = val_df[cat_cols + num_cols]
test_X = test_df[cat_cols + num_cols]
```

In [ ]:
```
print (dev_df.shape)
print (dev_df.columns)

print (val_df.shape)
print (val_df.columns)

print (dev_y.shape)

print (val_y.shape)
```

```
        print (dev_X.shape)
        print (dev_X.columns)

        print (val_X.shape)
        print (val_X.columns)

        print (test_X.shape)
        print (test_X.columns)
```

In [47]:
```
#SPLITTING DATA AS 75% FOR TRAIN AND 25% FOR VALIDATION

        x, y = train_df.shape
        x1 = 3 * int(x / 4)

        dev_df = train_df[0:x1]
        val_df = train_df[x1:x]

        dev_X = dev_df
        val_X = val_df

        dev_y = np.log1p(dev_X["totals_transactionRevenue"].values)
        val_y = np.log1p(val_X["totals_transactionRevenue"].values)

        dev_X = dev_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId'] + ['v
        val_X = val_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId'] + ['v

        test_X = test_df
        test_X = test_X.drop(['date'] + ['fullVisitorId'] + ['visitStartTime'], axis=1)

        print (dev_y.shape)

        print (val_y.shape)

        print (dev_X.shape)
        print (dev_X.columns)

        print (val_X.shape)
        print (val_X.columns)

        print (test_X.shape)
        print (test_X.columns)
```

```
(677739,)
(225914,)
(677739, 33)
Index(['channelGrouping', 'visitId', 'visitNumber', 'device_browser',
       'device_deviceCategory', 'device_isMobile', 'device_operatingSystem',
       'geoNetwork_city', 'geoNetwork_continent', 'geoNetwork_country',
```

```
       'geoNetwork_metro', 'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
(225914, 33)
Index(['channelGrouping', 'visitId', 'visitNumber', 'device_browser',
       'device_deviceCategory', 'device_isMobile', 'device_operatingSystem',
       'geoNetwork_city', 'geoNetwork_continent', 'geoNetwork_country',
       'geoNetwork_metro', 'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
(804684, 33)
Index(['channelGrouping', 'visitId', 'visitNumber', 'device_browser',
       'device_deviceCategory', 'device_isMobile', 'device_operatingSystem',
       'geoNetwork_city', 'geoNetwork_continent', 'geoNetwork_country',
       'geoNetwork_metro', 'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
```

```
In [ ]: # import sys
        # !conda install --yes --prefix {sys.prefix} lightgbm
```

```
In [ ]: # !conda install --yes lightgbm
```

```
In [ ]: # !conda install --yes -c conda-forge lightgbm
```

```
In [48]: print ("TRAIN")
         print (train_df.shape)
         print (train_df.columns)

         print ("TEST")
         print (test_df.shape)
         print (test_df.columns)
```

```
TRAIN
(903653, 37)
Index(['channelGrouping', 'date', 'fullVisitorId', 'visitId', 'visitNumber',
       'visitStartTime', 'device_browser', 'device_deviceCategory',
       'device_isMobile', 'device_operatingSystem', 'geoNetwork_city',
       'geoNetwork_continent', 'geoNetwork_country', 'geoNetwork_metro',
       'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'totals_transactionRevenue',
       'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
      dtype='object')
TEST
(804684, 36)
Index(['channelGrouping', 'date', 'fullVisitorId', 'visitId', 'visitNumber',
       'visitStartTime', 'device_browser', 'device_deviceCategory',
       'device_isMobile', 'device_operatingSystem', 'geoNetwork_city',
       'geoNetwork_continent', 'geoNetwork_country', 'geoNetwork_metro',
       'geoNetwork_networkDomain', 'geoNetwork_region',
       'geoNetwork_subContinent', 'totals_bounces', 'totals_hits',
       'totals_newVisits', 'totals_pageviews', 'trafficSource_adContent',
       'trafficSource_adwordsClickInfo.adNetworkType',
       'trafficSource_adwordsClickInfo.gclId',
       'trafficSource_adwordsClickInfo.isVideoAd',
       'trafficSource_adwordsClickInfo.page',
       'trafficSource_adwordsClickInfo.slot', 'trafficSource_campaign',
       'trafficSource_isTrueDirect', 'trafficSource_keyword',
       'trafficSource_medium', 'trafficSource_referralPath',
       'trafficSource_source', 'dayofweek', 'hour', 'month'],
```

```
      dtype='object')
```

```
In [ ]: imp_cols = ["channelGrouping",
                    "device_operatingSystem",
                    "geoNetwork_city", "geoNetwork_region",
                    "geoNetwork_country",
                    "geoNetwork_metro",
                    "geoNetwork_networkDomain",
                    "trafficSource_adwordsClickInfo.gclId",
                    "trafficSource_referralPath", "trafficSource_source",
                    "totals_hits", "totals_pageviews", "visitNumber"
                    , "visitId"
                   ]

        dev_X = dev_X[imp_cols]
        val_X = val_X[imp_cols]
        test_X = test_X[imp_cols]
```

```
In [ ]: import lightgbm as lgb
```

```
In [49]: train_df.dtypes
```

```
Out[49]: channelGrouping                                    int64
         date                                       datetime64[ns]
         fullVisitorId                                    object
         visitId                                           int64
         visitNumber                                     float64
         visitStartTime                             datetime64[ns]
         device_browser                                    int64
         device_deviceCategory                             int64
         device_isMobile                                    bool
         device_operatingSystem                            int64
         geoNetwork_city                                   int64
         geoNetwork_continent                              int64
         geoNetwork_country                                int64
         geoNetwork_metro                                  int64
         geoNetwork_networkDomain                          int64
         geoNetwork_region                                 int64
         geoNetwork_subContinent                           int64
         totals_bounces                                  float64
         totals_hits                                     float64
         totals_newVisits                                float64
         totals_pageviews                                float64
         totals_transactionRevenue                       float64
         trafficSource_adContent                           int64
         trafficSource_adwordsClickInfo.adNetworkType      int64
         trafficSource_adwordsClickInfo.gclId              int64
         trafficSource_adwordsClickInfo.isVideoAd          int64
```

```
trafficSource_adwordsClickInfo.page                    int64
trafficSource_adwordsClickInfo.slot                    int64
trafficSource_campaign                                 int64
trafficSource_isTrueDirect                             int64
trafficSource_keyword                                  int64
trafficSource_medium                                   int64
trafficSource_referralPath                             int64
trafficSource_source                                   int64
dayofweek                                            float64
hour                                                 float64
month                                                float64
dtype: object
```

In [50]:
```
# LGB
def run_lgb(train_X, train_y, val_X, val_y, test_X):
    params = {
        "objective" : "regression",
        "metric" : "rmse",
        "num_leaves" : 30,
        "min_child_samples" : 100,
        "learning_rate" : 0.1,
        "bagging_fraction" : 0.7,
        "feature_fraction" : 0.5,
        "bagging_frequency" : 5,
        "bagging_seed" : 2018,
        "verbosity" : -1
    }

    lgtrain = lgb.Dataset(train_X, label=train_y)
    lgval = lgb.Dataset(val_X, label=val_y)
    model = lgb.train(params, lgtrain, 1000, valid_sets=[lgval], early_stopping_rounds

    pred_test_y = model.predict(test_X, num_iteration=model.best_iteration)
    pred_val_y = model.predict(val_X, num_iteration=model.best_iteration)
    return pred_test_y, model, pred_val_y

# Training the model #
pred_test, model, pred_val = run_lgb(dev_X, dev_y, val_X, val_y, test_X)
```

```
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60807
[300]        valid_0's rmse: 1.60715
Early stopping, best iteration is:
[257]        valid_0's rmse: 1.60683
```

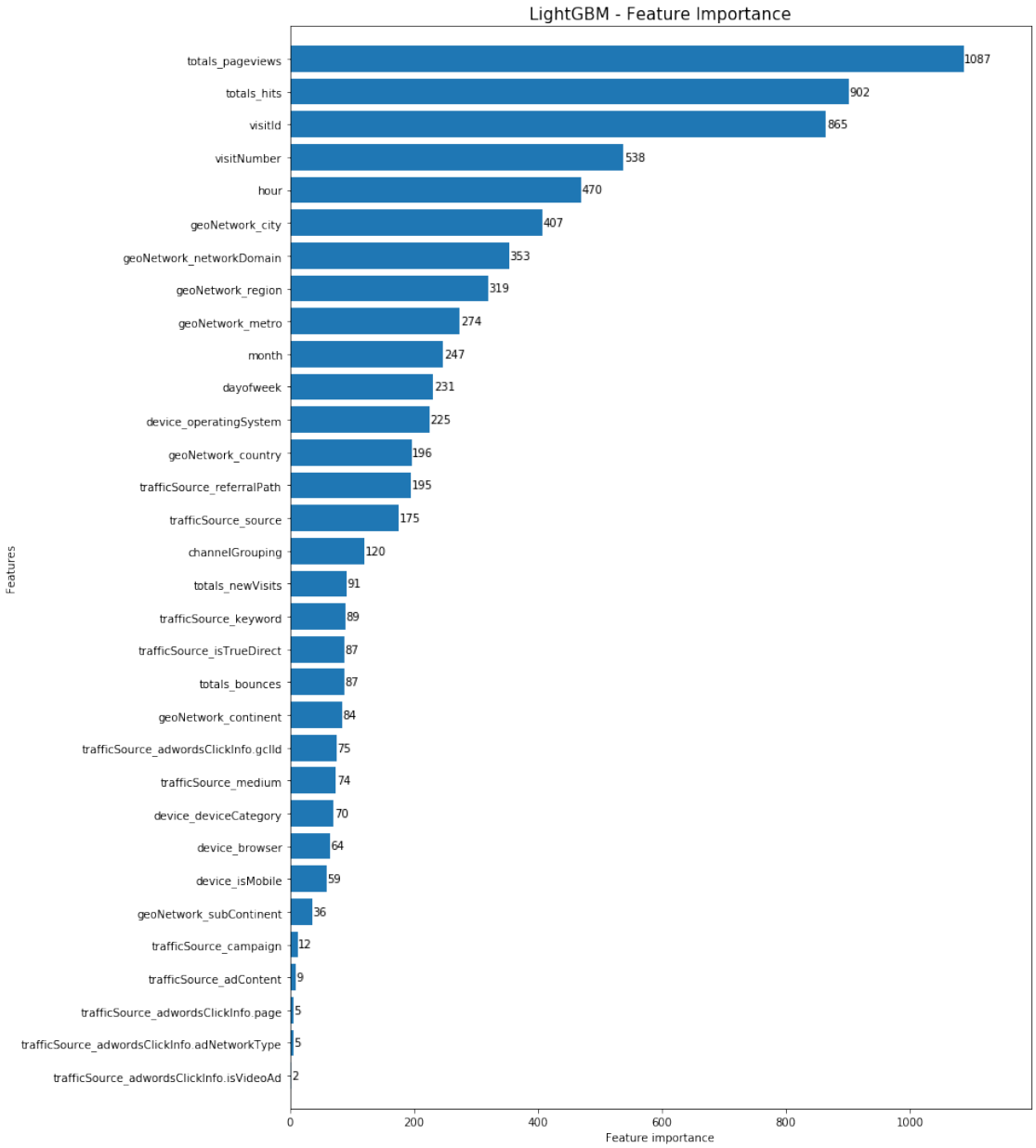
In [51]:
```
from sklearn import metrics
pred_val[pred_val<0] = 0
```

```
        val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
        val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
        val_pred_df["PredictedRevenue"] = np.expm1(pred_val)
        #print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionRevenue"].
        val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "PredictedRev
        print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionRevenue"].va
```

```
1.6288250113593938
```

```
In [52]: sub_df = pd.DataFrame({"fullVisitorId":test_id})
         pred_test[pred_test<0] = 0
         sub_df["PredictedLogRevenue"] = np.expm1(pred_test)
         sub_df = sub_df.groupby("fullVisitorId")["PredictedLogRevenue"].sum().reset_index()
         sub_df.columns = ["fullVisitorId", "PredictedLogRevenue"]
         sub_df["PredictedLogRevenue"] = np.log1p(sub_df["PredictedLogRevenue"])
         sub_df.to_csv("prediction_1.csv", index=False)
```

```
In [53]: fig, ax = plt.subplots(figsize=(12,18))
         lgb.plot_importance(model, max_num_features=50, height=0.8, ax=ax)
         ax.grid(False)
         plt.title("LightGBM - Feature Importance", fontsize=15)
         plt.show()
```




```
In [55]: # LGB FOR PERMUTATION TEST
         def run_lgb_perm(train_X, train_y, val_X, val_y):
             params = {
                 "objective" : "regression",
                 "metric" : "rmse",
                 "num_leaves" : 30,
                 "min_child_samples" : 100,
                 "learning_rate" : 0.1,
                 "bagging_fraction" : 0.7,
                 "feature_fraction" : 0.5,
```

```
            "bagging_frequency" : 5,
            "bagging_seed" : 2018,
            "verbosity" : -1
        }

        lgtrain = lgb.Dataset(train_X, label=train_y)
        lgval = lgb.Dataset(val_X, label=val_y)
        model = lgb.train(params, lgtrain, 1000, valid_sets=[lgval], early_stopping_rounds

        pred_val_y = model.predict(val_X, num_iteration=model.best_iteration)
        return model, pred_val_y
```

In [56]:
```
base_rmse = 1.60683
iter = 100
p_val = []

#for column_perm in ["totals_pageviews", "totals_hits", "visitID", "totals_newVisits"
for column_perm in ["totals_pageviews", "totals_hits", "trafficSource_campaign"]:
    ans = []
    for i in range(iter):
        print(column_perm," ",i)
        train_permute = train_df.copy()
        train_permute[column_perm] = np.random.permutation(train_permute[column_perm])
        x, y = train_df.shape
        x1 = 3 * int(x / 4)

        dev_df = train_permute[0:x1]
        val_df = train_permute[x1:x]

        dev_X = dev_df
        val_X = val_df

        dev_y = np.log1p(dev_X["totals_transactionRevenue"].values)
        val_y = np.log1p(val_X["totals_transactionRevenue"].values)

        dev_X = dev_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId
        val_X = val_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId

        model, pred_val = run_lgb_perm(dev_X, dev_y, val_X, val_y)

        from sklearn import metrics
        pred_val[pred_val<0] = 0
        val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
        val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
        val_pred_df["PredictedRevenue"] = np.expm1(pred_val)
        val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "Pred
        print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionReve
        ans.append(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactio
```

```
            less_sum = sum(i <= base_rmse for i in ans)
            p_val.append(less_sum/iter)

totals_pageviews   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67808
[200]        valid_0's rmse: 1.6777
Early stopping, best iteration is:
[151]        valid_0's rmse: 1.67647
1.6989862887281182
totals_pageviews   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67818
[200]        valid_0's rmse: 1.67617
[300]        valid_0's rmse: 1.67705
Early stopping, best iteration is:
[238]        valid_0's rmse: 1.67599
1.6974820694022061
totals_pageviews   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67927
[200]        valid_0's rmse: 1.6778
Early stopping, best iteration is:
[170]        valid_0's rmse: 1.67775
1.7007559549528832
totals_pageviews   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67913
[200]        valid_0's rmse: 1.67794
Early stopping, best iteration is:
[152]        valid_0's rmse: 1.67738
1.7004178736941358
totals_pageviews   4
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6792
[200]        valid_0's rmse: 1.67786
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67774
1.699650990753695
totals_pageviews   5
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67783
[200]        valid_0's rmse: 1.67559
[300]        valid_0's rmse: 1.67534
Early stopping, best iteration is:
[275]        valid_0's rmse: 1.67491
1.6957901933110862
```

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totals_pageviews   6
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67925
[200]        valid_0's rmse: 1.67761
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67752
1.6995395606551928
totals_pageviews   7
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67973
[200]        valid_0's rmse: 1.67826
Early stopping, best iteration is:
[174]        valid_0's rmse: 1.67791
1.7001860192051486
totals_pageviews   8
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67829
[200]        valid_0's rmse: 1.67628
[300]        valid_0's rmse: 1.6768
Early stopping, best iteration is:
[219]        valid_0's rmse: 1.67588
1.697322747153912
totals_pageviews   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67852
[200]        valid_0's rmse: 1.67673
[300]        valid_0's rmse: 1.67712
Early stopping, best iteration is:
[218]        valid_0's rmse: 1.67639
1.69807651351799
totals_pageviews   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67944
[200]        valid_0's rmse: 1.67776
Early stopping, best iteration is:
[148]        valid_0's rmse: 1.67706
1.6997502911286602
totals_pageviews   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67801
[200]        valid_0's rmse: 1.67562
[300]        valid_0's rmse: 1.67584
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.67548
1.6976226070885345
totals_pageviews   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67814
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[200]        valid_0's rmse: 1.67657
[300]        valid_0's rmse: 1.67576
Early stopping, best iteration is:
[284]        valid_0's rmse: 1.67552
1.6965417131003528
totals_pageviews   13
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67897
[200]        valid_0's rmse: 1.6775
Early stopping, best iteration is:
[140]        valid_0's rmse: 1.67716
1.6997925261165145
totals_pageviews   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67897
[200]        valid_0's rmse: 1.67664
[300]        valid_0's rmse: 1.67691
Early stopping, best iteration is:
[239]        valid_0's rmse: 1.67632
1.6980924087471005
totals_pageviews   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67992
[200]        valid_0's rmse: 1.67788
[300]        valid_0's rmse: 1.67857
Early stopping, best iteration is:
[240]        valid_0's rmse: 1.67781
1.699294751768431
totals_pageviews   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67752
[200]        valid_0's rmse: 1.67596
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67589
1.696998394172894
totals_pageviews   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67739
[200]        valid_0's rmse: 1.6763
Early stopping, best iteration is:
[149]        valid_0's rmse: 1.67584
1.6985238410899655
totals_pageviews   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67795
[200]        valid_0's rmse: 1.67674
[300]        valid_0's rmse: 1.67637
Early stopping, best iteration is:
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[267]        valid_0's rmse: 1.67599
1.6975197127784498
totals_pageviews   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67751
[200]        valid_0's rmse: 1.67569
[300]        valid_0's rmse: 1.6758
Early stopping, best iteration is:
[209]        valid_0's rmse: 1.6755
1.6981531500768925
totals_pageviews   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67811
[200]        valid_0's rmse: 1.67638
Early stopping, best iteration is:
[157]        valid_0's rmse: 1.67616
1.698990143909973
totals_pageviews   21
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67836
[200]        valid_0's rmse: 1.67695
Early stopping, best iteration is:
[142]        valid_0's rmse: 1.67659
1.6996569633035132
totals_pageviews   22
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67777
[200]        valid_0's rmse: 1.67615
Early stopping, best iteration is:
[156]        valid_0's rmse: 1.67569
1.6984519462538525
totals_pageviews   23
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6788
[200]        valid_0's rmse: 1.67664
[300]        valid_0's rmse: 1.67743
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.67648
1.6980450891402206
totals_pageviews   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67851
[200]        valid_0's rmse: 1.67699
Early stopping, best iteration is:
[190]        valid_0's rmse: 1.67679
1.699479414594047
totals_pageviews   25
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.67877
[200]        valid_0's rmse: 1.67657
[300]        valid_0's rmse: 1.67727
Early stopping, best iteration is:
[239]        valid_0's rmse: 1.67623
1.6979973832478723
totals_pageviews   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67924
[200]        valid_0's rmse: 1.6776
[300]        valid_0's rmse: 1.67796
Early stopping, best iteration is:
[200]        valid_0's rmse: 1.6776
1.6994789669043784
totals_pageviews   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67845
[200]        valid_0's rmse: 1.67665
[300]        valid_0's rmse: 1.67732
Early stopping, best iteration is:
[205]        valid_0's rmse: 1.67645
1.6987203805990068
totals_pageviews   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67806
[200]        valid_0's rmse: 1.67641
[300]        valid_0's rmse: 1.67577
[400]        valid_0's rmse: 1.67749
Early stopping, best iteration is:
[302]        valid_0's rmse: 1.6757
1.6963683170453845
totals_pageviews   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67818
[200]        valid_0's rmse: 1.67618
Early stopping, best iteration is:
[183]        valid_0's rmse: 1.67605
1.6980883112442309
totals_pageviews   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67828
[200]        valid_0's rmse: 1.67685
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67667
1.6988228392531395
totals_pageviews   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6789
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[200]	valid_0's rmse: 1.6769
Early stopping, best iteration is:
[197]	valid_0's rmse: 1.67685
1.6983133774986419
totals_pageviews   32
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67828
[200]	valid_0's rmse: 1.67543
[300]	valid_0's rmse: 1.67636
Early stopping, best iteration is:
[200]	valid_0's rmse: 1.67543
1.6974633509878132
totals_pageviews   33
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6797
[200]	valid_0's rmse: 1.67784
Early stopping, best iteration is:
[153]	valid_0's rmse: 1.67748
1.6998201173170622
totals_pageviews   34
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.679
[200]	valid_0's rmse: 1.67737
Early stopping, best iteration is:
[171]	valid_0's rmse: 1.67708
1.6996221100484386
totals_pageviews   35
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67667
[200]	valid_0's rmse: 1.67454
[300]	valid_0's rmse: 1.67531
Early stopping, best iteration is:
[224]	valid_0's rmse: 1.67432
1.6975258704711442
totals_pageviews   36
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67694
[200]	valid_0's rmse: 1.67498
[300]	valid_0's rmse: 1.67695
Early stopping, best iteration is:
[200]	valid_0's rmse: 1.67498
1.696957319452543
totals_pageviews   37
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67843
[200]	valid_0's rmse: 1.67658
[300]	valid_0's rmse: 1.67625
Early stopping, best iteration is:
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[292]        valid_0's rmse: 1.67622
1.6975305445967992
totals_pageviews   38
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67719
[200]        valid_0's rmse: 1.67637
Early stopping, best iteration is:
[157]        valid_0's rmse: 1.67582
1.698747910419099
totals_pageviews   39
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67931
[200]        valid_0's rmse: 1.6786
[300]        valid_0's rmse: 1.67827
Early stopping, best iteration is:
[241]        valid_0's rmse: 1.67792
1.698433094663458
totals_pageviews   40
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67835
[200]        valid_0's rmse: 1.67709
Early stopping, best iteration is:
[198]        valid_0's rmse: 1.67708
1.6993159195021037
totals_pageviews   41
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67862
[200]        valid_0's rmse: 1.67761
Early stopping, best iteration is:
[157]        valid_0's rmse: 1.67747
1.6996856444056014
totals_pageviews   42
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67938
[200]        valid_0's rmse: 1.67746
[300]        valid_0's rmse: 1.67757
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.67712
1.6983793893842716
totals_pageviews   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67754
[200]        valid_0's rmse: 1.67528
[300]        valid_0's rmse: 1.67514
Early stopping, best iteration is:
[208]        valid_0's rmse: 1.67494
1.6970511823263956
totals_pageviews   44
```

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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67669
[200]        valid_0's rmse: 1.67604
Early stopping, best iteration is:
[153]        valid_0's rmse: 1.67549
1.6983811338712649
totals_pageviews   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67743
[200]        valid_0's rmse: 1.67575
Early stopping, best iteration is:
[148]        valid_0's rmse: 1.67566
1.698483202090256
totals_pageviews   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67777
[200]        valid_0's rmse: 1.67508
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.67493
1.696951525007566
totals_pageviews   47
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6774
[200]        valid_0's rmse: 1.67609
Early stopping, best iteration is:
[149]        valid_0's rmse: 1.67588
1.6983768476215895
totals_pageviews   48
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67813
[200]        valid_0's rmse: 1.67774
Early stopping, best iteration is:
[153]        valid_0's rmse: 1.67721
1.7000911010860764
totals_pageviews   49
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67785
[200]        valid_0's rmse: 1.67628
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.67597
1.6989458175720649
totals_pageviews   50
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67756
[200]        valid_0's rmse: 1.67591
[300]        valid_0's rmse: 1.67603
Early stopping, best iteration is:
[277]        valid_0's rmse: 1.67582
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```
1.6969560573768883
totals_pageviews   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67863
[200]        valid_0's rmse: 1.6757
[300]        valid_0's rmse: 1.67692
Early stopping, best iteration is:
[236]        valid_0's rmse: 1.67547
1.6963592153885951
totals_pageviews   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67816
[200]        valid_0's rmse: 1.67667
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67646
1.6979466186809165
totals_pageviews   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67975
[200]        valid_0's rmse: 1.67836
[300]        valid_0's rmse: 1.67832
Early stopping, best iteration is:
[239]        valid_0's rmse: 1.6778
1.6999028654190913
totals_pageviews   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67844
[200]        valid_0's rmse: 1.67791
Early stopping, best iteration is:
[156]        valid_0's rmse: 1.67759
1.6997313705698247
totals_pageviews   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67784
[200]        valid_0's rmse: 1.67609
[300]        valid_0's rmse: 1.67661
Early stopping, best iteration is:
[248]        valid_0's rmse: 1.67577
1.6975229957004205
totals_pageviews   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67659
[200]        valid_0's rmse: 1.67532
Early stopping, best iteration is:
[150]        valid_0's rmse: 1.6749
1.6972061086743941
totals_pageviews   57
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.6784
[200]        valid_0's rmse: 1.67708
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.677
1.699225859512489
totals_pageviews   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67773
[200]        valid_0's rmse: 1.67536
[300]        valid_0's rmse: 1.67553
Early stopping, best iteration is:
[216]        valid_0's rmse: 1.67525
1.697452845265178
totals_pageviews   59
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67856
[200]        valid_0's rmse: 1.67634
[300]        valid_0's rmse: 1.67691
Early stopping, best iteration is:
[225]        valid_0's rmse: 1.67589
1.6975229688777966
totals_pageviews   60
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67911
[200]        valid_0's rmse: 1.67804
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67772
1.7003600223792303
totals_pageviews   61
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67933
[200]        valid_0's rmse: 1.67752
[300]        valid_0's rmse: 1.6779
Early stopping, best iteration is:
[244]        valid_0's rmse: 1.67731
1.6984497852328762
totals_pageviews   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67848
[200]        valid_0's rmse: 1.67802
Early stopping, best iteration is:
[171]        valid_0's rmse: 1.6774
1.7002213937862738
totals_pageviews   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67789
[200]        valid_0's rmse: 1.67613
[300]        valid_0's rmse: 1.6754
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[400]	valid_0's rmse: 1.67617
Early stopping, best iteration is:
[306]	valid_0's rmse: 1.67532
1.6959692926680503
totals_pageviews   64
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67744
[200]	valid_0's rmse: 1.67581
Early stopping, best iteration is:
[175]	valid_0's rmse: 1.67572
1.6978867231415813
totals_pageviews   65
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67793
[200]	valid_0's rmse: 1.6759
[300]	valid_0's rmse: 1.67633
Early stopping, best iteration is:
[229]	valid_0's rmse: 1.6759
1.6971218320580008
totals_pageviews   66
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6791
[200]	valid_0's rmse: 1.67728
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.67723
1.69963242543326
totals_pageviews   67
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67769
[200]	valid_0's rmse: 1.67691
Early stopping, best iteration is:
[139]	valid_0's rmse: 1.67675
1.6998628321270401
totals_pageviews   68
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67732
[200]	valid_0's rmse: 1.67698
Early stopping, best iteration is:
[158]	valid_0's rmse: 1.67632
1.6992110700824234
totals_pageviews   69
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67782
[200]	valid_0's rmse: 1.67554
[300]	valid_0's rmse: 1.6751
Early stopping, best iteration is:
[236]	valid_0's rmse: 1.67508
1.6970726368587985
```

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totals_pageviews   70
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67871
[200]        valid_0's rmse: 1.67677
Early stopping, best iteration is:
[199]        valid_0's rmse: 1.67676
1.698447762799126
totals_pageviews   71
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67796
[200]        valid_0's rmse: 1.67666
Early stopping, best iteration is:
[151]        valid_0's rmse: 1.67615
1.698343580187142
totals_pageviews   72
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67689
[200]        valid_0's rmse: 1.6755
Early stopping, best iteration is:
[158]        valid_0's rmse: 1.67518
1.6976307656779712
totals_pageviews   73
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67833
[200]        valid_0's rmse: 1.67783
Early stopping, best iteration is:
[158]        valid_0's rmse: 1.67714
1.698783648466736
totals_pageviews   74
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67812
[200]        valid_0's rmse: 1.6769
Early stopping, best iteration is:
[147]        valid_0's rmse: 1.67655
1.6994981297775338
totals_pageviews   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67924
[200]        valid_0's rmse: 1.67721
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67692
1.6990558459248004
totals_pageviews   76
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67899
[200]        valid_0's rmse: 1.67798
Early stopping, best iteration is:
[148]        valid_0's rmse: 1.67743
```

```
1.7001885590560288
totals_pageviews   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67769
[200]        valid_0's rmse: 1.67647
Early stopping, best iteration is:
[129]        valid_0's rmse: 1.67629
1.699704108037471
totals_pageviews   78
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67955
[200]        valid_0's rmse: 1.67827
Early stopping, best iteration is:
[149]        valid_0's rmse: 1.67784
1.7003169848313027
totals_pageviews   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.678
[200]        valid_0's rmse: 1.67561
Early stopping, best iteration is:
[151]        valid_0's rmse: 1.67559
1.69823000983128
totals_pageviews   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67781
[200]        valid_0's rmse: 1.67629
[300]        valid_0's rmse: 1.67791
Early stopping, best iteration is:
[224]        valid_0's rmse: 1.67619
1.6981787049574375
totals_pageviews   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6788
[200]        valid_0's rmse: 1.6773
[300]        valid_0's rmse: 1.67873
Early stopping, best iteration is:
[204]        valid_0's rmse: 1.67725
1.699539288233864
totals_pageviews   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67845
[200]        valid_0's rmse: 1.67619
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.67594
1.6985081873665229
totals_pageviews   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6776
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[200]	valid_0's rmse: 1.67632
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.67608
1.6975825431259215
totals_pageviews   84
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67869
[200]	valid_0's rmse: 1.67683
[300]	valid_0's rmse: 1.67677
Early stopping, best iteration is:
[236]	valid_0's rmse: 1.6764
1.6983342901773917
totals_pageviews   85
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6785
[200]	valid_0's rmse: 1.67616
[300]	valid_0's rmse: 1.67616
Early stopping, best iteration is:
[208]	valid_0's rmse: 1.67599
1.6978076389102592
totals_pageviews   86
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67903
[200]	valid_0's rmse: 1.67757
[300]	valid_0's rmse: 1.67738
[400]	valid_0's rmse: 1.67806
Early stopping, best iteration is:
[321]	valid_0's rmse: 1.6771
1.69818905189591
totals_pageviews   87
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6779
[200]	valid_0's rmse: 1.67664
Early stopping, best iteration is:
[197]	valid_0's rmse: 1.67655
1.6977705172348216
totals_pageviews   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67833
[200]	valid_0's rmse: 1.67682
[300]	valid_0's rmse: 1.67603
[400]	valid_0's rmse: 1.67704
Early stopping, best iteration is:
[346]	valid_0's rmse: 1.67579
1.6966424667945863
totals_pageviews   89
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67845
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[200]        valid_0's rmse: 1.67657
Early stopping, best iteration is:
[172]        valid_0's rmse: 1.67626
1.6991414758326047
totals_pageviews   90
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67688
[200]        valid_0's rmse: 1.67502
[300]        valid_0's rmse: 1.67546
Early stopping, best iteration is:
[224]        valid_0's rmse: 1.6747
1.696992738864252
totals_pageviews   91
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67796
[200]        valid_0's rmse: 1.67623
[300]        valid_0's rmse: 1.67747
Early stopping, best iteration is:
[219]        valid_0's rmse: 1.67594
1.6980899056848198
totals_pageviews   92
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67885
[200]        valid_0's rmse: 1.67721
[300]        valid_0's rmse: 1.67782
Early stopping, best iteration is:
[237]        valid_0's rmse: 1.67707
1.6991478406224572
totals_pageviews   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67825
[200]        valid_0's rmse: 1.67648
Early stopping, best iteration is:
[171]        valid_0's rmse: 1.67606
1.698833559609511
totals_pageviews   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67811
[200]        valid_0's rmse: 1.67713
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67711
1.6989955681925042
totals_pageviews   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67817
[200]        valid_0's rmse: 1.67671
[300]        valid_0's rmse: 1.67799
Early stopping, best iteration is:
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[236]	valid_0's rmse: 1.67656
1.6977293551534614
totals_pageviews   96
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67813
[200]	valid_0's rmse: 1.6771
Early stopping, best iteration is:
[176]	valid_0's rmse: 1.67675
1.6996978939149423
totals_pageviews   97
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67825
[200]	valid_0's rmse: 1.67611
[300]	valid_0's rmse: 1.67614
Early stopping, best iteration is:
[243]	valid_0's rmse: 1.67581
1.6977392330160581
totals_pageviews   98
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67813
[200]	valid_0's rmse: 1.67428
[300]	valid_0's rmse: 1.67424
Early stopping, best iteration is:
[253]	valid_0's rmse: 1.67362
1.6952351630053704
totals_pageviews   99
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67847
[200]	valid_0's rmse: 1.67627
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.67603
1.6988394506919486
totals_hits   0
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63986
[200]	valid_0's rmse: 1.63785
[300]	valid_0's rmse: 1.63774
Early stopping, best iteration is:
[225]	valid_0's rmse: 1.63733
1.6582353222962012
totals_hits   1
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63948
[200]	valid_0's rmse: 1.63842
[300]	valid_0's rmse: 1.63932
Early stopping, best iteration is:
[229]	valid_0's rmse: 1.63824
1.6583894076283499
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totals_hits   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64181
[200]        valid_0's rmse: 1.642
Early stopping, best iteration is:
[120]        valid_0's rmse: 1.64081
1.6619544998694948
totals_hits   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64021
[200]        valid_0's rmse: 1.63921
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.63915
1.66034614145215
totals_hits   4
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64043
[200]        valid_0's rmse: 1.63886
[300]        valid_0's rmse: 1.63889
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.63839
1.6587602718406786
totals_hits   5
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64097
[200]        valid_0's rmse: 1.63938
[300]        valid_0's rmse: 1.63932
Early stopping, best iteration is:
[248]        valid_0's rmse: 1.639
1.6595930532964833
totals_hits   6
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64129
[200]        valid_0's rmse: 1.64057
[300]        valid_0's rmse: 1.64173
Early stopping, best iteration is:
[219]        valid_0's rmse: 1.64007
1.660388838261372
totals_hits   7
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63979
[200]        valid_0's rmse: 1.6382
[300]        valid_0's rmse: 1.63806
[400]        valid_0's rmse: 1.63957
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.63783
1.6585153921649551
totals_hits   8
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63999
[200]        valid_0's rmse: 1.63825
Early stopping, best iteration is:
[171]        valid_0's rmse: 1.6379
1.6590377499838573
totals_hits   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6407
[200]        valid_0's rmse: 1.63887
Early stopping, best iteration is:
[184]        valid_0's rmse: 1.63865
1.6599318707494881
totals_hits   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64084
[200]        valid_0's rmse: 1.63895
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.63894
1.6595181781486041
totals_hits   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64099
[200]        valid_0's rmse: 1.63988
Early stopping, best iteration is:
[189]        valid_0's rmse: 1.63946
1.660870242925919
totals_hits   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64096
[200]        valid_0's rmse: 1.63887
[300]        valid_0's rmse: 1.64003
Early stopping, best iteration is:
[220]        valid_0's rmse: 1.63869
1.658984656391649
totals_hits   13
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6405
[200]        valid_0's rmse: 1.63965
[300]        valid_0's rmse: 1.64045
Early stopping, best iteration is:
[215]        valid_0's rmse: 1.6394
1.6592105498967114
totals_hits   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63926
[200]        valid_0's rmse: 1.63866
[300]        valid_0's rmse: 1.63892
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Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63856
1.6597397066026585
totals_hits   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64192
[200]        valid_0's rmse: 1.6399
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.63965
1.661812352964959
totals_hits   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6403
[200]        valid_0's rmse: 1.6387
[300]        valid_0's rmse: 1.63894
Early stopping, best iteration is:
[253]        valid_0's rmse: 1.63852
1.6590060026678668
totals_hits   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64023
[200]        valid_0's rmse: 1.63935
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.63924
1.659904927340771
totals_hits   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64171
[200]        valid_0's rmse: 1.64134
Early stopping, best iteration is:
[162]        valid_0's rmse: 1.64074
1.6611659755603134
totals_hits   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64005
[200]        valid_0's rmse: 1.63837
[300]        valid_0's rmse: 1.63796
Early stopping, best iteration is:
[244]        valid_0's rmse: 1.63784
1.6582029163282652
totals_hits   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64062
[200]        valid_0's rmse: 1.63824
[300]        valid_0's rmse: 1.63923
Early stopping, best iteration is:
[241]        valid_0's rmse: 1.63782
1.65934300165291
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totals_hits   21
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64064
[200]        valid_0's rmse: 1.63859
Early stopping, best iteration is:
[182]        valid_0's rmse: 1.63844
1.659906906217879
totals_hits   22
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64043
[200]        valid_0's rmse: 1.63937
[300]        valid_0's rmse: 1.64002
Early stopping, best iteration is:
[245]        valid_0's rmse: 1.63925
1.659698884509927
totals_hits   23
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63977
[200]        valid_0's rmse: 1.63898
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.6384
1.659868535723483
totals_hits   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64072
[200]        valid_0's rmse: 1.63893
[300]        valid_0's rmse: 1.6396
Early stopping, best iteration is:
[230]        valid_0's rmse: 1.63838
1.6585598512518462
totals_hits   25
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64016
[200]        valid_0's rmse: 1.63848
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63816
1.6599689936105069
totals_hits   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6406
[200]        valid_0's rmse: 1.63879
[300]        valid_0's rmse: 1.63909
Early stopping, best iteration is:
[248]        valid_0's rmse: 1.63846
1.659130611121912
totals_hits   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64116
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[200]	valid_0's rmse: 1.64053
Early stopping, best iteration is:
[125]	valid_0's rmse: 1.63947
1.6615889253915692
totals_hits   28
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6396
[200]	valid_0's rmse: 1.63915
Early stopping, best iteration is:
[160]	valid_0's rmse: 1.63892
1.6596942019419731
totals_hits   29
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64012
[200]	valid_0's rmse: 1.63813
[300]	valid_0's rmse: 1.63876
Early stopping, best iteration is:
[236]	valid_0's rmse: 1.63732
1.6575108990993972
totals_hits   30
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63956
[200]	valid_0's rmse: 1.63853
Early stopping, best iteration is:
[161]	valid_0's rmse: 1.63767
1.6592367591666004
totals_hits   31
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63942
[200]	valid_0's rmse: 1.63739
Early stopping, best iteration is:
[188]	valid_0's rmse: 1.637
1.657290968490113
totals_hits   32
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64039
[200]	valid_0's rmse: 1.63752
[300]	valid_0's rmse: 1.6383
Early stopping, best iteration is:
[248]	valid_0's rmse: 1.63733
1.6576921039335935
totals_hits   33
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64035
[200]	valid_0's rmse: 1.63779
Early stopping, best iteration is:
[188]	valid_0's rmse: 1.63741
1.6585591731204494
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totals_hits   34
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63978
[200]        valid_0's rmse: 1.6392
[300]        valid_0's rmse: 1.64033
Early stopping, best iteration is:
[216]        valid_0's rmse: 1.63861
1.6598853883374085
totals_hits   35
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64048
[200]        valid_0's rmse: 1.63857
[300]        valid_0's rmse: 1.6395
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63834
1.658699414427171
totals_hits   36
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64023
[200]        valid_0's rmse: 1.63872
Early stopping, best iteration is:
[173]        valid_0's rmse: 1.6384
1.6594895913454202
totals_hits   37
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6404
[200]        valid_0's rmse: 1.6399
Early stopping, best iteration is:
[181]        valid_0's rmse: 1.63928
1.659802987855421
totals_hits   38
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64049
[200]        valid_0's rmse: 1.63846
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.63828
1.6594732849109828
totals_hits   39
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64013
[200]        valid_0's rmse: 1.63841
Early stopping, best iteration is:
[171]        valid_0's rmse: 1.63826
1.6599870296766979
totals_hits   40
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63966
[200]        valid_0's rmse: 1.63834
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Early stopping, best iteration is:
[199]        valid_0's rmse: 1.63827
1.6595573148447225
totals_hits   41
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63978
[200]        valid_0's rmse: 1.63923
[300]        valid_0's rmse: 1.64004
Early stopping, best iteration is:
[232]        valid_0's rmse: 1.63862
1.6589730832518532
totals_hits   42
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64064
[200]        valid_0's rmse: 1.63904
Early stopping, best iteration is:
[175]        valid_0's rmse: 1.63895
1.660012934936168
totals_hits   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64063
[200]        valid_0's rmse: 1.63913
[300]        valid_0's rmse: 1.63974
Early stopping, best iteration is:
[239]        valid_0's rmse: 1.63896
1.6595468272157938
totals_hits   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64046
[200]        valid_0's rmse: 1.63837
[300]        valid_0's rmse: 1.6384
Early stopping, best iteration is:
[208]        valid_0's rmse: 1.63802
1.658478732294756
totals_hits   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64025
[200]        valid_0's rmse: 1.63967
Early stopping, best iteration is:
[182]        valid_0's rmse: 1.6393
1.6608230729706455
totals_hits   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64073
[200]        valid_0's rmse: 1.6389
[300]        valid_0's rmse: 1.64018
Early stopping, best iteration is:
[200]        valid_0's rmse: 1.6389
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1.65929909146957
totals_hits   47
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64122
[200]        valid_0's rmse: 1.63988
Early stopping, best iteration is:
[171]        valid_0's rmse: 1.63929
1.6600451008292207
totals_hits   48
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64032
[200]        valid_0's rmse: 1.63899
Early stopping, best iteration is:
[161]        valid_0's rmse: 1.63865
1.6606809898533421
totals_hits   49
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64107
[200]        valid_0's rmse: 1.63937
[300]        valid_0's rmse: 1.64092
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.63916
1.6595973882856245
totals_hits   50
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64073
[200]        valid_0's rmse: 1.63843
[300]        valid_0's rmse: 1.6392
Early stopping, best iteration is:
[236]        valid_0's rmse: 1.63801
1.6581643485393738
totals_hits   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63985
[200]        valid_0's rmse: 1.63797
[300]        valid_0's rmse: 1.63828
Early stopping, best iteration is:
[212]        valid_0's rmse: 1.63769
1.6586716875255805
totals_hits   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63978
[200]        valid_0's rmse: 1.63835
[300]        valid_0's rmse: 1.63926
Early stopping, best iteration is:
[201]        valid_0's rmse: 1.63831
1.6588817299432317
totals_hits   53
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63941
[200]        valid_0's rmse: 1.63799
Early stopping, best iteration is:
[188]        valid_0's rmse: 1.63765
1.6580359650758252
totals_hits   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64016
[200]        valid_0's rmse: 1.63875
[300]        valid_0's rmse: 1.64046
Early stopping, best iteration is:
[225]        valid_0's rmse: 1.63849
1.65846016209701
totals_hits   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64099
[200]        valid_0's rmse: 1.63878
[300]        valid_0's rmse: 1.63887
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63851
1.6595624065282795
totals_hits   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63947
[200]        valid_0's rmse: 1.63754
[300]        valid_0's rmse: 1.63921
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63751
1.6588198128730933
totals_hits   57
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64065
[200]        valid_0's rmse: 1.63991
Early stopping, best iteration is:
[188]        valid_0's rmse: 1.63966
1.6605851208308642
totals_hits   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64049
[200]        valid_0's rmse: 1.63916
[300]        valid_0's rmse: 1.6395
Early stopping, best iteration is:
[226]        valid_0's rmse: 1.63888
1.6589991697140851
totals_hits   59
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64012
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[200]	valid_0's rmse: 1.63877
[300]	valid_0's rmse: 1.63858
[400]	valid_0's rmse: 1.64015
Early stopping, best iteration is:
[322]	valid_0's rmse: 1.63843
1.6583776280502802
totals_hits   60
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64058
[200]	valid_0's rmse: 1.63938
Early stopping, best iteration is:
[178]	valid_0's rmse: 1.63898
1.6605375245387726
totals_hits   61
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63998
[200]	valid_0's rmse: 1.63903
Early stopping, best iteration is:
[166]	valid_0's rmse: 1.63862
1.6597776128047281
totals_hits   62
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64023
[200]	valid_0's rmse: 1.63856
[300]	valid_0's rmse: 1.63931
Early stopping, best iteration is:
[229]	valid_0's rmse: 1.63844
1.6600346052491821
totals_hits   63
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6402
[200]	valid_0's rmse: 1.63781
[300]	valid_0's rmse: 1.63764
Early stopping, best iteration is:
[255]	valid_0's rmse: 1.63716
1.6585508508890907
totals_hits   64
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64025
[200]	valid_0's rmse: 1.63774
[300]	valid_0's rmse: 1.63868
Early stopping, best iteration is:
[203]	valid_0's rmse: 1.63756
1.6584878201548257
totals_hits   65
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64087
[200]	valid_0's rmse: 1.63913
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[300]	valid_0's rmse: 1.63999
Early stopping, best iteration is:
[235]	valid_0's rmse: 1.63888
1.65912509660924
totals_hits   66
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6399
[200]	valid_0's rmse: 1.63768
Early stopping, best iteration is:
[190]	valid_0's rmse: 1.6374
1.6582439176495647
totals_hits   67
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63995
[200]	valid_0's rmse: 1.63813
Early stopping, best iteration is:
[188]	valid_0's rmse: 1.63776
1.6587983075753423
totals_hits   68
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63971
[200]	valid_0's rmse: 1.63849
Early stopping, best iteration is:
[168]	valid_0's rmse: 1.63804
1.6597491170464316
totals_hits   69
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64079
[200]	valid_0's rmse: 1.63904
[300]	valid_0's rmse: 1.63978
Early stopping, best iteration is:
[245]	valid_0's rmse: 1.6386
1.6593769978140915
totals_hits   70
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64124
[200]	valid_0's rmse: 1.64004
Early stopping, best iteration is:
[160]	valid_0's rmse: 1.6397
1.6615424091117235
totals_hits   71
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64037
[200]	valid_0's rmse: 1.63853
[300]	valid_0's rmse: 1.63957
Early stopping, best iteration is:
[226]	valid_0's rmse: 1.63843
1.6587229801975962
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totals_hits   72
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63957
[200]        valid_0's rmse: 1.6384
[300]        valid_0's rmse: 1.64003
Early stopping, best iteration is:
[244]        valid_0's rmse: 1.63817
1.658847750576032
totals_hits   73
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64101
[200]        valid_0's rmse: 1.63983
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63932
1.6606231918339396
totals_hits   74
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64169
[200]        valid_0's rmse: 1.64027
[300]        valid_0's rmse: 1.64085
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.64006
1.6605065519235371
totals_hits   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63997
[200]        valid_0's rmse: 1.63841
[300]        valid_0's rmse: 1.63871
Early stopping, best iteration is:
[223]        valid_0's rmse: 1.63832
1.6584834415106686
totals_hits   76
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63988
[200]        valid_0's rmse: 1.6379
[300]        valid_0's rmse: 1.63867
Early stopping, best iteration is:
[224]        valid_0's rmse: 1.63749
1.6583288927900486
totals_hits   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64018
[200]        valid_0's rmse: 1.63834
[300]        valid_0's rmse: 1.63829
Early stopping, best iteration is:
[271]        valid_0's rmse: 1.63818
1.658831060245553
totals_hits   78
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64007
[200]        valid_0's rmse: 1.63902
[300]        valid_0's rmse: 1.64006
Early stopping, best iteration is:
[210]        valid_0's rmse: 1.63865
1.658983712589785
totals_hits   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63989
[200]        valid_0's rmse: 1.63833
Early stopping, best iteration is:
[193]        valid_0's rmse: 1.63822
1.6585080969442176
totals_hits   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63974
[200]        valid_0's rmse: 1.63844
[300]        valid_0's rmse: 1.63984
Early stopping, best iteration is:
[204]        valid_0's rmse: 1.63822
1.6589606063641442
totals_hits   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64062
[200]        valid_0's rmse: 1.6385
Early stopping, best iteration is:
[170]        valid_0's rmse: 1.63843
1.6591198634916284
totals_hits   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64072
[200]        valid_0's rmse: 1.63982
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63927
1.6612351104949696
totals_hits   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63992
[200]        valid_0's rmse: 1.63873
Early stopping, best iteration is:
[192]        valid_0's rmse: 1.63843
1.6589199875183422
totals_hits   84
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63984
[200]        valid_0's rmse: 1.63868
Early stopping, best iteration is:
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[182]        valid_0's rmse: 1.63831
1.6597962340615726
totals_hits   85
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64145
[200]        valid_0's rmse: 1.63923
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.63905
1.6596607072956215
totals_hits   86
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64027
[200]        valid_0's rmse: 1.6389
[300]        valid_0's rmse: 1.63999
Early stopping, best iteration is:
[232]        valid_0's rmse: 1.63847
1.6589370141875712
totals_hits   87
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64041
[200]        valid_0's rmse: 1.63876
Early stopping, best iteration is:
[186]        valid_0's rmse: 1.63832
1.6589215373779809
totals_hits   88
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64072
[200]        valid_0's rmse: 1.63954
Early stopping, best iteration is:
[167]        valid_0's rmse: 1.63908
1.6604544123942913
totals_hits   89
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63945
[200]        valid_0's rmse: 1.63723
[300]        valid_0's rmse: 1.63817
Early stopping, best iteration is:
[228]        valid_0's rmse: 1.63715
1.6575302223039827
totals_hits   90
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64061
[200]        valid_0's rmse: 1.63902
[300]        valid_0's rmse: 1.63929
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63884
1.6601724817014865
totals_hits   91
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6405
[200]        valid_0's rmse: 1.63888
[300]        valid_0's rmse: 1.63902
Early stopping, best iteration is:
[272]        valid_0's rmse: 1.63838
1.6585653309872153
totals_hits   92
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63992
[200]        valid_0's rmse: 1.63858
Early stopping, best iteration is:
[178]        valid_0's rmse: 1.63807
1.6597288489080662
totals_hits   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64058
[200]        valid_0's rmse: 1.63972
Early stopping, best iteration is:
[166]        valid_0's rmse: 1.63896
1.6606794240222926
totals_hits   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63987
[200]        valid_0's rmse: 1.63864
Early stopping, best iteration is:
[161]        valid_0's rmse: 1.63844
1.6596932946517198
totals_hits   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6408
[200]        valid_0's rmse: 1.63976
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.63907
1.6599840526791012
totals_hits   96
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63956
[200]        valid_0's rmse: 1.6374
[300]        valid_0's rmse: 1.63811
Early stopping, best iteration is:
[201]        valid_0's rmse: 1.63712
1.658005726164206
totals_hits   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64066
[200]        valid_0's rmse: 1.63902
[300]        valid_0's rmse: 1.63909
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Early stopping, best iteration is:
[283]	valid_0's rmse: 1.63867
1.658744402956583
totals_hits   98
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64051
[200]	valid_0's rmse: 1.63957
Early stopping, best iteration is:
[160]	valid_0's rmse: 1.63893
1.659673862280382
totals_hits   99
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63921
[200]	valid_0's rmse: 1.63718
[300]	valid_0's rmse: 1.63775
Early stopping, best iteration is:
[203]	valid_0's rmse: 1.63675
1.6568955616928889
trafficSource_campaign   0
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61514
[200]	valid_0's rmse: 1.60819
[300]	valid_0's rmse: 1.60697
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60688
1.6293299730406916
trafficSource_campaign   1
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61383
[200]	valid_0's rmse: 1.60727
[300]	valid_0's rmse: 1.60558
Early stopping, best iteration is:
[293]	valid_0's rmse: 1.60508
1.6274928015844519
trafficSource_campaign   2
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61357
[200]	valid_0's rmse: 1.6066
[300]	valid_0's rmse: 1.60409
[400]	valid_0's rmse: 1.60577
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60388
1.6261061961177277
trafficSource_campaign   3
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6149
[200]	valid_0's rmse: 1.60798
[300]	valid_0's rmse: 1.60662
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Early stopping, best iteration is:
[257]	valid_0's rmse: 1.60606
1.6284821223055068
trafficSource_campaign   4
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61515
[200]	valid_0's rmse: 1.61012
[300]	valid_0's rmse: 1.60716
[400]	valid_0's rmse: 1.60898
Early stopping, best iteration is:
[317]	valid_0's rmse: 1.60681
1.6285539549971366
trafficSource_campaign   5
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61619
[200]	valid_0's rmse: 1.60844
[300]	valid_0's rmse: 1.60679
[400]	valid_0's rmse: 1.60796
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60643
1.627686596037699
trafficSource_campaign   6
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61624
[200]	valid_0's rmse: 1.60797
[300]	valid_0's rmse: 1.60697
Early stopping, best iteration is:
[235]	valid_0's rmse: 1.60662
1.6288032877124292
trafficSource_campaign   7
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61568
[200]	valid_0's rmse: 1.60842
[300]	valid_0's rmse: 1.60657
Early stopping, best iteration is:
[263]	valid_0's rmse: 1.60642
1.628748404142735
trafficSource_campaign   8
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61407
[200]	valid_0's rmse: 1.60741
[300]	valid_0's rmse: 1.60598
Early stopping, best iteration is:
[287]	valid_0's rmse: 1.60587
1.6274038110191933
trafficSource_campaign   9
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61443
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[200]	valid_0's rmse: 1.60604
[300]	valid_0's rmse: 1.60498
[400]	valid_0's rmse: 1.60606
Early stopping, best iteration is:
[341]	valid_0's rmse: 1.60463
1.625871696370572
trafficSource_campaign   10
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61512
[200]	valid_0's rmse: 1.60776
[300]	valid_0's rmse: 1.60618
Early stopping, best iteration is:
[285]	valid_0's rmse: 1.60605
1.627540331711749
trafficSource_campaign   11
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61349
[200]	valid_0's rmse: 1.60559
[300]	valid_0's rmse: 1.60468
Early stopping, best iteration is:
[273]	valid_0's rmse: 1.60463
1.6270528329724074
trafficSource_campaign   12
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61408
[200]	valid_0's rmse: 1.60841
[300]	valid_0's rmse: 1.60722
Early stopping, best iteration is:
[264]	valid_0's rmse: 1.60703
1.6290375583460306
trafficSource_campaign   13
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61666
[200]	valid_0's rmse: 1.60907
[300]	valid_0's rmse: 1.60622
Early stopping, best iteration is:
[287]	valid_0's rmse: 1.60612
1.6281904802929166
trafficSource_campaign   14
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61682
[200]	valid_0's rmse: 1.61077
[300]	valid_0's rmse: 1.60786
[400]	valid_0's rmse: 1.60832
Early stopping, best iteration is:
[332]	valid_0's rmse: 1.60759
1.6298293912935455
trafficSource_campaign   15
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61511
[200]        valid_0's rmse: 1.60783
[300]        valid_0's rmse: 1.60534
[400]        valid_0's rmse: 1.60575
Early stopping, best iteration is:
[378]        valid_0's rmse: 1.60521
1.626545113969588
trafficSource_campaign   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61405
[200]        valid_0's rmse: 1.60715
[300]        valid_0's rmse: 1.60647
[400]        valid_0's rmse: 1.60685
Early stopping, best iteration is:
[334]        valid_0's rmse: 1.60588
1.627502447457238
trafficSource_campaign   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61471
[200]        valid_0's rmse: 1.60751
[300]        valid_0's rmse: 1.60642
[400]        valid_0's rmse: 1.60626
Early stopping, best iteration is:
[365]        valid_0's rmse: 1.60595
1.6280312310295635
trafficSource_campaign   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61392
[200]        valid_0's rmse: 1.60862
[300]        valid_0's rmse: 1.60653
[400]        valid_0's rmse: 1.60737
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.60623
1.6279910841032859
trafficSource_campaign   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61492
[200]        valid_0's rmse: 1.60809
[300]        valid_0's rmse: 1.6059
[400]        valid_0's rmse: 1.60713
Early stopping, best iteration is:
[312]        valid_0's rmse: 1.60576
1.6288649404546194
trafficSource_campaign   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61424
[200]        valid_0's rmse: 1.60772
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[300]	valid_0's rmse: 1.60512
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60496
1.6275759396392828
trafficSource_campaign   21
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61506
[200]	valid_0's rmse: 1.60831
[300]	valid_0's rmse: 1.60581
[400]	valid_0's rmse: 1.60704
Early stopping, best iteration is:
[312]	valid_0's rmse: 1.6055
1.6271605366267894
trafficSource_campaign   22
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6158
[200]	valid_0's rmse: 1.60796
[300]	valid_0's rmse: 1.60673
Early stopping, best iteration is:
[274]	valid_0's rmse: 1.60643
1.6282130804534722
trafficSource_campaign   23
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61626
[200]	valid_0's rmse: 1.60874
[300]	valid_0's rmse: 1.60716
[400]	valid_0's rmse: 1.60744
Early stopping, best iteration is:
[358]	valid_0's rmse: 1.60677
1.6286942557877166
trafficSource_campaign   24
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61548
[200]	valid_0's rmse: 1.60945
[300]	valid_0's rmse: 1.60668
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60664
1.6285228151853717
trafficSource_campaign   25
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61462
[200]	valid_0's rmse: 1.60791
[300]	valid_0's rmse: 1.60574
[400]	valid_0's rmse: 1.60648
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.6056
1.6276058062674237
trafficSource_campaign   26
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61432
[200]        valid_0's rmse: 1.60623
[300]        valid_0's rmse: 1.60579
[400]        valid_0's rmse: 1.60655
Early stopping, best iteration is:
[326]        valid_0's rmse: 1.60547
1.6276444643386405
trafficSource_campaign   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61555
[200]        valid_0's rmse: 1.60663
[300]        valid_0's rmse: 1.60524
[400]        valid_0's rmse: 1.60642
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60503
1.6273835666562568
trafficSource_campaign   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61524
[200]        valid_0's rmse: 1.60783
[300]        valid_0's rmse: 1.60592
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60578
1.6274926086080983
trafficSource_campaign   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61539
[200]        valid_0's rmse: 1.60747
[300]        valid_0's rmse: 1.606
Early stopping, best iteration is:
[298]        valid_0's rmse: 1.60597
1.6272568222854167
trafficSource_campaign   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61425
[200]        valid_0's rmse: 1.60703
[300]        valid_0's rmse: 1.60582
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.6055
1.6276118487154545
trafficSource_campaign   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.6091
[300]        valid_0's rmse: 1.60778
Early stopping, best iteration is:
[295]        valid_0's rmse: 1.60767
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1.6297754704427685
trafficSource_campaign   32
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61516
[200]        valid_0's rmse: 1.60853
[300]        valid_0's rmse: 1.60682
[400]        valid_0's rmse: 1.6063
Early stopping, best iteration is:
[367]        valid_0's rmse: 1.60594
1.6265716580332474
trafficSource_campaign   33
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61473
[200]        valid_0's rmse: 1.60809
[300]        valid_0's rmse: 1.60728
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.607
1.6290369982658852
trafficSource_campaign   34
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61386
[200]        valid_0's rmse: 1.60614
[300]        valid_0's rmse: 1.60516
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60489
1.626082354558382
trafficSource_campaign   35
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61519
[200]        valid_0's rmse: 1.60854
[300]        valid_0's rmse: 1.6073
[400]        valid_0's rmse: 1.60799
Early stopping, best iteration is:
[320]        valid_0's rmse: 1.60689
1.6284941647154951
trafficSource_campaign   36
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61446
[200]        valid_0's rmse: 1.60754
[300]        valid_0's rmse: 1.60646
Early stopping, best iteration is:
[274]        valid_0's rmse: 1.60601
1.6271342192759097
trafficSource_campaign   37
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6155
[200]        valid_0's rmse: 1.6082
[300]        valid_0's rmse: 1.60646
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[400]	valid_0's rmse: 1.60785
Early stopping, best iteration is:
[327]	valid_0's rmse: 1.60636
1.6276051047066942
trafficSource_campaign   38
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61583
[200]	valid_0's rmse: 1.6078
[300]	valid_0's rmse: 1.6062
Early stopping, best iteration is:
[268]	valid_0's rmse: 1.60581
1.6283286382618056
trafficSource_campaign   39
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6163
[200]	valid_0's rmse: 1.60854
[300]	valid_0's rmse: 1.60615
Early stopping, best iteration is:
[289]	valid_0's rmse: 1.60603
1.6280622670789515
trafficSource_campaign   40
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61519
[200]	valid_0's rmse: 1.60684
[300]	valid_0's rmse: 1.60435
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60434
1.6272541887154752
trafficSource_campaign   41
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61465
[200]	valid_0's rmse: 1.60737
[300]	valid_0's rmse: 1.6044
[400]	valid_0's rmse: 1.60499
Early stopping, best iteration is:
[335]	valid_0's rmse: 1.60398
1.6263625610823773
trafficSource_campaign   42
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61601
[200]	valid_0's rmse: 1.60744
[300]	valid_0's rmse: 1.6056
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.6053
1.627441123139131
trafficSource_campaign   43
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61541
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[200]	valid_0's rmse: 1.60749
[300]	valid_0's rmse: 1.60519
[400]	valid_0's rmse: 1.60516
Early stopping, best iteration is:
[342]	valid_0's rmse: 1.60465
1.6269188979300537
trafficSource_campaign   44
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61462
[200]	valid_0's rmse: 1.60776
[300]	valid_0's rmse: 1.60603
Early stopping, best iteration is:
[295]	valid_0's rmse: 1.60601
1.6283201503614337
trafficSource_campaign   45
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61516
[200]	valid_0's rmse: 1.60811
[300]	valid_0's rmse: 1.60593
Early stopping, best iteration is:
[293]	valid_0's rmse: 1.60565
1.6274135103502965
trafficSource_campaign   46
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61498
[200]	valid_0's rmse: 1.6067
[300]	valid_0's rmse: 1.60575
[400]	valid_0's rmse: 1.60575
Early stopping, best iteration is:
[374]	valid_0's rmse: 1.60519
1.627397254313126
trafficSource_campaign   47
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61516
[200]	valid_0's rmse: 1.60888
[300]	valid_0's rmse: 1.60734
[400]	valid_0's rmse: 1.6075
Early stopping, best iteration is:
[314]	valid_0's rmse: 1.60708
1.6284928677790347
trafficSource_campaign   48
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61304
[200]	valid_0's rmse: 1.60701
[300]	valid_0's rmse: 1.60592
[400]	valid_0's rmse: 1.60665
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.6058
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1.6282338851902927
trafficSource_campaign   49
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61564
[200]        valid_0's rmse: 1.60887
[300]        valid_0's rmse: 1.60708
[400]        valid_0's rmse: 1.60825
Early stopping, best iteration is:
[306]        valid_0's rmse: 1.60696
1.6295962229923648
trafficSource_campaign   50
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61553
[200]        valid_0's rmse: 1.60703
[300]        valid_0's rmse: 1.60591
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60567
1.6270753019010908
trafficSource_campaign   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61517
[200]        valid_0's rmse: 1.60778
[300]        valid_0's rmse: 1.60572
[400]        valid_0's rmse: 1.60718
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.6057
1.6279652831452467
trafficSource_campaign   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61525
[200]        valid_0's rmse: 1.60834
[300]        valid_0's rmse: 1.60595
[400]        valid_0's rmse: 1.6062
Early stopping, best iteration is:
[363]        valid_0's rmse: 1.6055
1.626504700857237
trafficSource_campaign   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6152
[200]        valid_0's rmse: 1.60779
[300]        valid_0's rmse: 1.6071
[400]        valid_0's rmse: 1.60849
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.60687
1.6286860233806801
trafficSource_campaign   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6146
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[200]	valid_0's rmse: 1.60729
[300]	valid_0's rmse: 1.60504
[400]	valid_0's rmse: 1.60733
Early stopping, best iteration is:
[301]	valid_0's rmse: 1.60503
1.627031663174588
trafficSource_campaign   55
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61435
[200]	valid_0's rmse: 1.60866
[300]	valid_0's rmse: 1.60686
Early stopping, best iteration is:
[274]	valid_0's rmse: 1.60665
1.6291218748620868
trafficSource_campaign   56
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61437
[200]	valid_0's rmse: 1.6078
[300]	valid_0's rmse: 1.60537
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60517
1.6279300821259968
trafficSource_campaign   57
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61562
[200]	valid_0's rmse: 1.60831
[300]	valid_0's rmse: 1.60629
[400]	valid_0's rmse: 1.60779
Early stopping, best iteration is:
[308]	valid_0's rmse: 1.60617
1.6277694662325628
trafficSource_campaign   58
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61452
[200]	valid_0's rmse: 1.60722
[300]	valid_0's rmse: 1.60545
[400]	valid_0's rmse: 1.60636
Early stopping, best iteration is:
[312]	valid_0's rmse: 1.60514
1.6270413340966348
trafficSource_campaign   59
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61349
[200]	valid_0's rmse: 1.60621
[300]	valid_0's rmse: 1.60409
[400]	valid_0's rmse: 1.60513
Early stopping, best iteration is:
[300]	valid_0's rmse: 1.60409
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1.6259869063958672
trafficSource_campaign   60
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61706
[200]        valid_0's rmse: 1.60845
[300]        valid_0's rmse: 1.60771
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.60752
1.6285158255581762
trafficSource_campaign   61
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61522
[200]        valid_0's rmse: 1.60856
[300]        valid_0's rmse: 1.60666
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60662
1.6288258730478449
trafficSource_campaign   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61328
[200]        valid_0's rmse: 1.60726
[300]        valid_0's rmse: 1.60585
Early stopping, best iteration is:
[294]        valid_0's rmse: 1.60568
1.6273189793443672
trafficSource_campaign   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61538
[200]        valid_0's rmse: 1.6086
[300]        valid_0's rmse: 1.60722
[400]        valid_0's rmse: 1.60839
Early stopping, best iteration is:
[336]        valid_0's rmse: 1.60682
1.6280588165489098
trafficSource_campaign   64
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61354
[200]        valid_0's rmse: 1.60787
[300]        valid_0's rmse: 1.60605
Early stopping, best iteration is:
[271]        valid_0's rmse: 1.60578
1.6277844566995392
trafficSource_campaign   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61453
[200]        valid_0's rmse: 1.60785
[300]        valid_0's rmse: 1.60596
[400]        valid_0's rmse: 1.60663
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Early stopping, best iteration is:
[319]        valid_0's rmse: 1.60562
1.6272692393383523
trafficSource_campaign   66
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61542
[200]        valid_0's rmse: 1.6078
[300]        valid_0's rmse: 1.60683
[400]        valid_0's rmse: 1.60717
Early stopping, best iteration is:
[342]        valid_0's rmse: 1.60635
1.6272766022286402
trafficSource_campaign   67
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61321
[200]        valid_0's rmse: 1.60569
[300]        valid_0's rmse: 1.60458
Early stopping, best iteration is:
[294]        valid_0's rmse: 1.60448
1.6270020255228441
trafficSource_campaign   68
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61312
[200]        valid_0's rmse: 1.60545
[300]        valid_0's rmse: 1.60453
Early stopping, best iteration is:
[284]        valid_0's rmse: 1.60426
1.6263664394195687
trafficSource_campaign   69
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61588
[200]        valid_0's rmse: 1.60904
[300]        valid_0's rmse: 1.60684
[400]        valid_0's rmse: 1.60703
Early stopping, best iteration is:
[374]        valid_0's rmse: 1.60656
1.6275971561392564
trafficSource_campaign   70
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61566
[200]        valid_0's rmse: 1.607
[300]        valid_0's rmse: 1.60541
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60538
1.627514499034561
trafficSource_campaign   71
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61308
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[200]	valid_0's rmse: 1.6057
[300]	valid_0's rmse: 1.60445
[400]	valid_0's rmse: 1.60481
Early stopping, best iteration is:
[317]	valid_0's rmse: 1.60401
1.6268051747252341
trafficSource_campaign   72
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61415
[200]	valid_0's rmse: 1.60643
[300]	valid_0's rmse: 1.60567
Early stopping, best iteration is:
[287]	valid_0's rmse: 1.60543
1.6275224290501515
trafficSource_campaign   73
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61546
[200]	valid_0's rmse: 1.60888
[300]	valid_0's rmse: 1.60786
Early stopping, best iteration is:
[286]	valid_0's rmse: 1.60764
1.6296107750172553
trafficSource_campaign   74
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61403
[200]	valid_0's rmse: 1.6064
[300]	valid_0's rmse: 1.6055
[400]	valid_0's rmse: 1.60655
Early stopping, best iteration is:
[338]	valid_0's rmse: 1.60533
1.6271278027386715
trafficSource_campaign   75
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61415
[200]	valid_0's rmse: 1.60724
[300]	valid_0's rmse: 1.60549
[400]	valid_0's rmse: 1.60702
Early stopping, best iteration is:
[323]	valid_0's rmse: 1.60537
1.6272148415478505
trafficSource_campaign   76
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61429
[200]	valid_0's rmse: 1.6069
[300]	valid_0's rmse: 1.60681
Early stopping, best iteration is:
[233]	valid_0's rmse: 1.60606
1.6279052943491614
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trafficSource_campaign   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61452
[200]        valid_0's rmse: 1.60736
[300]        valid_0's rmse: 1.60639
[400]        valid_0's rmse: 1.60681
Early stopping, best iteration is:
[318]        valid_0's rmse: 1.60621
1.6285033949944847
trafficSource_campaign   78
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61537
[200]        valid_0's rmse: 1.60853
[300]        valid_0's rmse: 1.60628
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60622
1.628012166781119
trafficSource_campaign   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61517
[200]        valid_0's rmse: 1.60802
[300]        valid_0's rmse: 1.60672
[400]        valid_0's rmse: 1.60756
Early stopping, best iteration is:
[340]        valid_0's rmse: 1.60638
1.6280951988719334
trafficSource_campaign   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61557
[200]        valid_0's rmse: 1.60687
[300]        valid_0's rmse: 1.60586
Early stopping, best iteration is:
[262]        valid_0's rmse: 1.60527
1.627032523505746
trafficSource_campaign   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61408
[200]        valid_0's rmse: 1.60808
[300]        valid_0's rmse: 1.60551
[400]        valid_0's rmse: 1.60611
Early stopping, best iteration is:
[357]        valid_0's rmse: 1.6055
1.6269795417445512
trafficSource_campaign   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61625
[200]        valid_0's rmse: 1.61023
[300]        valid_0's rmse: 1.60917
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Early stopping, best iteration is:
[299]	valid_0's rmse: 1.60915
1.6306888323969677
trafficSource_campaign   83
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61452
[200]	valid_0's rmse: 1.6071
[300]	valid_0's rmse: 1.60496
[400]	valid_0's rmse: 1.60503
Early stopping, best iteration is:
[374]	valid_0's rmse: 1.60452
1.627024372037277
trafficSource_campaign   84
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61355
[200]	valid_0's rmse: 1.60614
[300]	valid_0's rmse: 1.60468
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60462
1.6270304416216428
trafficSource_campaign   85
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61463
[200]	valid_0's rmse: 1.60702
[300]	valid_0's rmse: 1.60643
[400]	valid_0's rmse: 1.60711
Early stopping, best iteration is:
[342]	valid_0's rmse: 1.60607
1.6275629767620927
trafficSource_campaign   86
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61486
[200]	valid_0's rmse: 1.60771
[300]	valid_0's rmse: 1.6068
Early stopping, best iteration is:
[272]	valid_0's rmse: 1.60643
1.6285367780981315
trafficSource_campaign   87
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61457
[200]	valid_0's rmse: 1.60753
[300]	valid_0's rmse: 1.60656
Early stopping, best iteration is:
[263]	valid_0's rmse: 1.60629
1.6288885373203872
trafficSource_campaign   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61492
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[200]        valid_0's rmse: 1.60846
[300]        valid_0's rmse: 1.60748
[400]        valid_0's rmse: 1.60859
Early stopping, best iteration is:
[318]        valid_0's rmse: 1.60722
1.6291563852568094
trafficSource_campaign   89
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61679
[200]        valid_0's rmse: 1.60906
[300]        valid_0's rmse: 1.60683
[400]        valid_0's rmse: 1.60784
Early stopping, best iteration is:
[320]        valid_0's rmse: 1.60671
1.628890552077398
trafficSource_campaign   90
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61544
[200]        valid_0's rmse: 1.60633
[300]        valid_0's rmse: 1.60491
[400]        valid_0's rmse: 1.60646
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60482
1.62637672870822
trafficSource_campaign   91
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61484
[200]        valid_0's rmse: 1.60831
[300]        valid_0's rmse: 1.60765
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.60729
1.629240974823243
trafficSource_campaign   92
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61378
[200]        valid_0's rmse: 1.60795
[300]        valid_0's rmse: 1.60595
[400]        valid_0's rmse: 1.60752
Early stopping, best iteration is:
[308]        valid_0's rmse: 1.60576
1.6275483439994345
trafficSource_campaign   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61638
[200]        valid_0's rmse: 1.60803
[300]        valid_0's rmse: 1.60715
Early stopping, best iteration is:
[262]        valid_0's rmse: 1.60668
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1.628646219295886
trafficSource_campaign   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61484
[200]        valid_0's rmse: 1.60779
[300]        valid_0's rmse: 1.60572
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60568
1.6278451102597529
trafficSource_campaign   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61438
[200]        valid_0's rmse: 1.60828
[300]        valid_0's rmse: 1.6076
Early stopping, best iteration is:
[247]        valid_0's rmse: 1.60747
1.6292056176642296
trafficSource_campaign   96
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61568
[200]        valid_0's rmse: 1.60852
[300]        valid_0's rmse: 1.60686
[400]        valid_0's rmse: 1.60701
Early stopping, best iteration is:
[359]        valid_0's rmse: 1.60648
1.6281592551387696
trafficSource_campaign   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61451
[200]        valid_0's rmse: 1.60738
[300]        valid_0's rmse: 1.60565
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60556
1.6280951072520131
trafficSource_campaign   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61436
[200]        valid_0's rmse: 1.60664
[300]        valid_0's rmse: 1.60526
[400]        valid_0's rmse: 1.60537
Early stopping, best iteration is:
[344]        valid_0's rmse: 1.60478
1.627427924667281
trafficSource_campaign   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61671
[200]        valid_0's rmse: 1.60927
[300]        valid_0's rmse: 1.60799
```

```
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.60757
1.6297162483934697
```

```
In [60]: print (p_val)
```

```
[0.0, 0.79]
```

```
In [58]: base_rmse = 1.6288250113593938
         iter = 100
         p_val = []

         #for column_perm in ["totals_pageviews", "totals_hits", "visitID", "totals_newVisits"
         for column_perm in ["totals_pageviews", "trafficSource_campaign"]:
             ans = []
             for i in range(iter):
                 print(column_perm," ",i)
                 train_permute = train_df.copy()
                 train_permute[column_perm] = np.random.permutation(train_permute[column_perm])
                 x, y = train_df.shape
                 x1 = 3 * int(x / 4)

                 dev_df = train_permute[0:x1]
                 val_df = train_permute[x1:x]

                 dev_X = dev_df
                 val_X = val_df

                 dev_y = np.log1p(dev_X["totals_transactionRevenue"].values)
                 val_y = np.log1p(val_X["totals_transactionRevenue"].values)

                 dev_X = dev_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId
                 val_X = val_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId

                 model, pred_val = run_lgb_perm(dev_X, dev_y, val_X, val_y)

                 from sklearn import metrics
                 pred_val[pred_val<0] = 0
                 val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
                 val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
                 val_pred_df["PredictedRevenue"] = np.expm1(pred_val)
                 val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "Pred
                 print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionReve
                 ans.append(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactio

             less_sum = sum(i <= base_rmse for i in ans)
             p_val.append(less_sum/iter)
```

```
totals_pageviews   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67677
[200]        valid_0's rmse: 1.67553
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67535
1.6961747323386536
totals_pageviews   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67883
[200]        valid_0's rmse: 1.6776
Early stopping, best iteration is:
[166]        valid_0's rmse: 1.67747
1.6998017951878899
totals_pageviews   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67885
[200]        valid_0's rmse: 1.67673
Early stopping, best iteration is:
[198]        valid_0's rmse: 1.67672
1.6985315755889436
totals_pageviews   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67829
[200]        valid_0's rmse: 1.67675
Early stopping, best iteration is:
[174]        valid_0's rmse: 1.67649
1.6989213615713228
totals_pageviews   4
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67861
[200]        valid_0's rmse: 1.6762
[300]        valid_0's rmse: 1.67754
Early stopping, best iteration is:
[210]        valid_0's rmse: 1.67617
1.6987711076470178
totals_pageviews   5
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67894
[200]        valid_0's rmse: 1.67776
Early stopping, best iteration is:
[156]        valid_0's rmse: 1.6775
1.7003015533161299
totals_pageviews   6
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67853
[200]        valid_0's rmse: 1.67703
Early stopping, best iteration is:
```

```
[195]        valid_0's rmse: 1.67674
1.6990624247294837
totals_pageviews   7
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67905
[200]        valid_0's rmse: 1.67695
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67689
1.6990040319377795
totals_pageviews   8
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67967
[200]        valid_0's rmse: 1.67851
[300]        valid_0's rmse: 1.67767
[400]        valid_0's rmse: 1.67813
Early stopping, best iteration is:
[378]        valid_0's rmse: 1.67752
1.698385641231648
totals_pageviews   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67747
[200]        valid_0's rmse: 1.67538
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.6753
1.6979615662591079
totals_pageviews   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67824
[200]        valid_0's rmse: 1.67538
Early stopping, best iteration is:
[199]        valid_0's rmse: 1.67538
1.697282998328556
totals_pageviews   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6782
[200]        valid_0's rmse: 1.678
Early stopping, best iteration is:
[153]        valid_0's rmse: 1.67753
1.700026497241635
totals_pageviews   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67873
[200]        valid_0's rmse: 1.67722
[300]        valid_0's rmse: 1.67737
Early stopping, best iteration is:
[239]        valid_0's rmse: 1.67682
1.6974832042942336
totals_pageviews   13
```

```
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.677
[200]        valid_0's rmse: 1.67563
[300]        valid_0's rmse: 1.67601
Early stopping, best iteration is:
[223]        valid_0's rmse: 1.67497
1.6967915341155242
totals_pageviews   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67848
[200]        valid_0's rmse: 1.67771
Early stopping, best iteration is:
[149]        valid_0's rmse: 1.67728
1.6997961142919211
totals_pageviews   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67762
[200]        valid_0's rmse: 1.67702
Early stopping, best iteration is:
[166]        valid_0's rmse: 1.6768
1.6992620235196665
totals_pageviews   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67854
[200]        valid_0's rmse: 1.67726
Early stopping, best iteration is:
[159]        valid_0's rmse: 1.67678
1.699435776482451
totals_pageviews   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67826
[200]        valid_0's rmse: 1.6765
[300]        valid_0's rmse: 1.6769
Early stopping, best iteration is:
[249]        valid_0's rmse: 1.67634
1.6975328072500693
totals_pageviews   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67856
[200]        valid_0's rmse: 1.67578
Early stopping, best iteration is:
[199]        valid_0's rmse: 1.67575
1.6978687458684902
totals_pageviews   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6785
[200]        valid_0's rmse: 1.67765
[300]        valid_0's rmse: 1.6774
```

```
Early stopping, best iteration is:
[274]	valid_0's rmse: 1.67708
1.6987613816923688
totals_pageviews   20
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67897
[200]	valid_0's rmse: 1.67715
[300]	valid_0's rmse: 1.67837
Early stopping, best iteration is:
[204]	valid_0's rmse: 1.67709
1.6985168357995675
totals_pageviews   21
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67851
[200]	valid_0's rmse: 1.67747
Early stopping, best iteration is:
[162]	valid_0's rmse: 1.67702
1.6997287820318423
totals_pageviews   22
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67799
[200]	valid_0's rmse: 1.67536
Early stopping, best iteration is:
[197]	valid_0's rmse: 1.67532
1.6974995386472076
totals_pageviews   23
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.679
[200]	valid_0's rmse: 1.67735
Early stopping, best iteration is:
[185]	valid_0's rmse: 1.67731
1.699618633584893
totals_pageviews   24
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67733
[200]	valid_0's rmse: 1.67586
Early stopping, best iteration is:
[197]	valid_0's rmse: 1.67573
1.698537722403409
totals_pageviews   25
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67906
[200]	valid_0's rmse: 1.67673
[300]	valid_0's rmse: 1.67652
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.67648
1.6975890060656684
totals_pageviews   26
```

```
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67867
[200]        valid_0's rmse: 1.67755
Early stopping, best iteration is:
[167]        valid_0's rmse: 1.67721
1.6995750594798327
totals_pageviews   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6788
[200]        valid_0's rmse: 1.67589
[300]        valid_0's rmse: 1.67606
Early stopping, best iteration is:
[282]        valid_0's rmse: 1.6756
1.696606411031572
totals_pageviews   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67793
[200]        valid_0's rmse: 1.67626
Early stopping, best iteration is:
[164]        valid_0's rmse: 1.67596
1.6993955844716044
totals_pageviews   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6779
[200]        valid_0's rmse: 1.67623
[300]        valid_0's rmse: 1.67608
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.67532
1.697053235268341
totals_pageviews   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67906
[200]        valid_0's rmse: 1.67783
[300]        valid_0's rmse: 1.67841
Early stopping, best iteration is:
[219]        valid_0's rmse: 1.67754
1.6997166950834093
totals_pageviews   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67738
[200]        valid_0's rmse: 1.67618
Early stopping, best iteration is:
[155]        valid_0's rmse: 1.67579
1.6986218133163375
totals_pageviews   32
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67753
[200]        valid_0's rmse: 1.67711
```

```
Early stopping, best iteration is:
[125]        valid_0's rmse: 1.67673
1.7001439667262759
totals_pageviews   33
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67972
[200]        valid_0's rmse: 1.67776
[300]        valid_0's rmse: 1.67872
Early stopping, best iteration is:
[223]        valid_0's rmse: 1.67752
1.6994829356929628
totals_pageviews   34
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67927
[200]        valid_0's rmse: 1.67683
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.67665
1.6988151381823573
totals_pageviews   35
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6801
[200]        valid_0's rmse: 1.67767
[300]        valid_0's rmse: 1.67751
Early stopping, best iteration is:
[246]        valid_0's rmse: 1.67693
1.6987315980975761
totals_pageviews   36
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67857
[200]        valid_0's rmse: 1.67779
Early stopping, best iteration is:
[167]        valid_0's rmse: 1.67767
1.6999808889825225
totals_pageviews   37
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6773
[200]        valid_0's rmse: 1.6752
[300]        valid_0's rmse: 1.67542
Early stopping, best iteration is:
[224]        valid_0's rmse: 1.67456
1.6962458174068968
totals_pageviews   38
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67814
[200]        valid_0's rmse: 1.67708
[300]        valid_0's rmse: 1.67745
Early stopping, best iteration is:
[221]        valid_0's rmse: 1.67643
```

```
1.6979966379686358
totals_pageviews   39
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67788
[200]        valid_0's rmse: 1.67673
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.67642
1.6981508700989545
totals_pageviews   40
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67673
[200]        valid_0's rmse: 1.67515
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67504
1.697861092159002
totals_pageviews   41
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67749
[200]        valid_0's rmse: 1.67672
Early stopping, best iteration is:
[165]        valid_0's rmse: 1.67613
1.6984285404773802
totals_pageviews   42
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67838
[200]        valid_0's rmse: 1.67748
Early stopping, best iteration is:
[184]        valid_0's rmse: 1.67727
1.6988800992352333
totals_pageviews   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67844
[200]        valid_0's rmse: 1.67757
Early stopping, best iteration is:
[193]        valid_0's rmse: 1.67728
1.6993349476496176
totals_pageviews   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67895
[200]        valid_0's rmse: 1.67647
[300]        valid_0's rmse: 1.67687
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.67636
1.6981802434057023
totals_pageviews   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67852
[200]        valid_0's rmse: 1.67679
```

```
[300]	valid_0's rmse: 1.67594
[400]	valid_0's rmse: 1.6766
Early stopping, best iteration is:
[360]	valid_0's rmse: 1.67567
1.6956395958161097
totals_pageviews   46
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67815
[200]	valid_0's rmse: 1.67696
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.67661
1.6988623886430025
totals_pageviews   47
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6771
[200]	valid_0's rmse: 1.67671
Early stopping, best iteration is:
[148]	valid_0's rmse: 1.67591
1.6988898037983269
totals_pageviews   48
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67899
[200]	valid_0's rmse: 1.67702
[300]	valid_0's rmse: 1.67636
[400]	valid_0's rmse: 1.67724
Early stopping, best iteration is:
[318]	valid_0's rmse: 1.67616
1.6972280352116456
totals_pageviews   49
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6784
[200]	valid_0's rmse: 1.67766
Early stopping, best iteration is:
[148]	valid_0's rmse: 1.67701
1.699519654618632
totals_pageviews   50
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67913
[200]	valid_0's rmse: 1.67723
Early stopping, best iteration is:
[167]	valid_0's rmse: 1.67686
1.6994795640791174
totals_pageviews   51
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67845
[200]	valid_0's rmse: 1.67676
Early stopping, best iteration is:
[197]	valid_0's rmse: 1.67669
```

```
1.6985474019588052
totals_pageviews   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67853
[200]        valid_0's rmse: 1.67615
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.6761
1.6981550429553376
totals_pageviews   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67795
[200]        valid_0's rmse: 1.67617
[300]        valid_0's rmse: 1.67591
Early stopping, best iteration is:
[261]        valid_0's rmse: 1.67532
1.6971894939688774
totals_pageviews   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67832
[200]        valid_0's rmse: 1.67648
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.67642
1.6983285967151167
totals_pageviews   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67907
[200]        valid_0's rmse: 1.67788
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.67771
1.6990894592753587
totals_pageviews   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67806
[200]        valid_0's rmse: 1.67575
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67568
1.6980823815397017
totals_pageviews   57
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6787
[200]        valid_0's rmse: 1.67632
Early stopping, best iteration is:
[190]        valid_0's rmse: 1.67617
1.69810356739935
totals_pageviews   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67944
[200]        valid_0's rmse: 1.67781
```

```
[300]	valid_0's rmse: 1.67715
[400]	valid_0's rmse: 1.67769
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.67702
1.6975178153690405
totals_pageviews   59
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67856
[200]	valid_0's rmse: 1.67633
[300]	valid_0's rmse: 1.67713
Early stopping, best iteration is:
[205]	valid_0's rmse: 1.67619
1.6981574204720453
totals_pageviews   60
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67783
[200]	valid_0's rmse: 1.67653
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.67643
1.699361368863696
totals_pageviews   61
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6779
[200]	valid_0's rmse: 1.67631
[300]	valid_0's rmse: 1.67692
Early stopping, best iteration is:
[208]	valid_0's rmse: 1.67597
1.697855951165924
totals_pageviews   62
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67824
[200]	valid_0's rmse: 1.67673
[300]	valid_0's rmse: 1.67767
Early stopping, best iteration is:
[203]	valid_0's rmse: 1.67665
1.699414388021294
totals_pageviews   63
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67803
[200]	valid_0's rmse: 1.67697
[300]	valid_0's rmse: 1.67783
Early stopping, best iteration is:
[224]	valid_0's rmse: 1.67661
1.6984577331277215
totals_pageviews   64
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67906
[200]	valid_0's rmse: 1.67648
```

```
[300]	valid_0's rmse: 1.6762
Early stopping, best iteration is:
[276]	valid_0's rmse: 1.67577
1.6968629685275074
totals_pageviews   65
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67751
[200]	valid_0's rmse: 1.67471
Early stopping, best iteration is:
[197]	valid_0's rmse: 1.67453
1.6962146033825856
totals_pageviews   66
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6789
[200]	valid_0's rmse: 1.67809
Early stopping, best iteration is:
[159]	valid_0's rmse: 1.67733
1.7000473631048691
totals_pageviews   67
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67802
[200]	valid_0's rmse: 1.67653
Early stopping, best iteration is:
[190]	valid_0's rmse: 1.67647
1.6980526376925003
totals_pageviews   68
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67736
[200]	valid_0's rmse: 1.67628
Early stopping, best iteration is:
[186]	valid_0's rmse: 1.67611
1.6991524686056005
totals_pageviews   69
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67776
[200]	valid_0's rmse: 1.67652
[300]	valid_0's rmse: 1.67654
Early stopping, best iteration is:
[249]	valid_0's rmse: 1.67625
1.6981056259908012
totals_pageviews   70
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.67925
[200]	valid_0's rmse: 1.67737
[300]	valid_0's rmse: 1.67832
Early stopping, best iteration is:
[213]	valid_0's rmse: 1.67705
1.6986511497928274
```

```
totals_pageviews   71
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67839
[200]        valid_0's rmse: 1.67586
[300]        valid_0's rmse: 1.67555
[400]        valid_0's rmse: 1.67615
Early stopping, best iteration is:
[345]        valid_0's rmse: 1.67519
1.6961861907613274
totals_pageviews   72
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67761
[200]        valid_0's rmse: 1.67577
[300]        valid_0's rmse: 1.6755
[400]        valid_0's rmse: 1.67627
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.67548
1.695507426824723
totals_pageviews   73
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67828
[200]        valid_0's rmse: 1.67605
[300]        valid_0's rmse: 1.67656
Early stopping, best iteration is:
[225]        valid_0's rmse: 1.6757
1.698707397865145
totals_pageviews   74
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67699
[200]        valid_0's rmse: 1.67589
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.6758
1.6976823600453548
totals_pageviews   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67916
[200]        valid_0's rmse: 1.67622
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67617
1.698035510182312
totals_pageviews   76
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67817
[200]        valid_0's rmse: 1.67721
[300]        valid_0's rmse: 1.67782
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.67713
1.6977536633454189
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totals_pageviews   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67875
[200]        valid_0's rmse: 1.67763
Early stopping, best iteration is:
[157]        valid_0's rmse: 1.67711
1.6999543058328892
totals_pageviews   78
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67807
[200]        valid_0's rmse: 1.67703
[300]        valid_0's rmse: 1.67721
Early stopping, best iteration is:
[249]        valid_0's rmse: 1.67687
1.698686296756465
totals_pageviews   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67921
[200]        valid_0's rmse: 1.67799
[300]        valid_0's rmse: 1.67779
[400]        valid_0's rmse: 1.67809
Early stopping, best iteration is:
[307]        valid_0's rmse: 1.67742
1.6992619707447283
totals_pageviews   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67862
[200]        valid_0's rmse: 1.67837
Early stopping, best iteration is:
[112]        valid_0's rmse: 1.6782
1.7021134357953225
totals_pageviews   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67838
[200]        valid_0's rmse: 1.67696
Early stopping, best iteration is:
[150]        valid_0's rmse: 1.67661
1.699089156570922
totals_pageviews   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67855
[200]        valid_0's rmse: 1.67673
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67662
1.699002418729685
totals_pageviews   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67803
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[200]        valid_0's rmse: 1.67676
Early stopping, best iteration is:
[170]        valid_0's rmse: 1.6766
1.698571272083012
totals_pageviews   84
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67818
[200]        valid_0's rmse: 1.67713
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.67699
1.6991892189411375
totals_pageviews   85
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67826
[200]        valid_0's rmse: 1.67604
Early stopping, best iteration is:
[170]        valid_0's rmse: 1.67575
1.698039381552507
totals_pageviews   86
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67898
[200]        valid_0's rmse: 1.67652
[300]        valid_0's rmse: 1.67567
[400]        valid_0's rmse: 1.67597
Early stopping, best iteration is:
[344]        valid_0's rmse: 1.67549
1.69623872607879
totals_pageviews   87
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67909
[200]        valid_0's rmse: 1.67684
[300]        valid_0's rmse: 1.6766
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.67642
1.6975815512983545
totals_pageviews   88
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67819
[200]        valid_0's rmse: 1.67638
[300]        valid_0's rmse: 1.67656
Early stopping, best iteration is:
[249]        valid_0's rmse: 1.67587
1.6971053108608491
totals_pageviews   89
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6784
[200]        valid_0's rmse: 1.67729
Early stopping, best iteration is:
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[198]        valid_0's rmse: 1.67726
1.6989413838571403
totals_pageviews   90
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6798
[200]        valid_0's rmse: 1.67718
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.67704
1.6984555422839196
totals_pageviews   91
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67948
[200]        valid_0's rmse: 1.67671
[300]        valid_0's rmse: 1.67728
Early stopping, best iteration is:
[217]        valid_0's rmse: 1.67632
1.6993649673573785
totals_pageviews   92
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67759
[200]        valid_0's rmse: 1.67569
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67569
1.697419937452226
totals_pageviews   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67865
[200]        valid_0's rmse: 1.67613
Early stopping, best iteration is:
[196]        valid_0's rmse: 1.67607
1.6990607126086026
totals_pageviews   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67706
[200]        valid_0's rmse: 1.67522
[300]        valid_0's rmse: 1.67567
Early stopping, best iteration is:
[203]        valid_0's rmse: 1.67515
1.6969401414487677
totals_pageviews   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67782
[200]        valid_0's rmse: 1.67483
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67467
1.6967469417125212
totals_pageviews   96
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.67877
[200]        valid_0's rmse: 1.67767
Early stopping, best iteration is:
[178]        valid_0's rmse: 1.67751
1.699842768748927
totals_pageviews   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67783
[200]        valid_0's rmse: 1.67609
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.67589
1.6985306763090144
totals_pageviews   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6783
[200]        valid_0's rmse: 1.67632
Early stopping, best iteration is:
[197]        valid_0's rmse: 1.67627
1.6978806776373316
totals_pageviews   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.67818
[200]        valid_0's rmse: 1.67597
[300]        valid_0's rmse: 1.67601
Early stopping, best iteration is:
[228]        valid_0's rmse: 1.6756
1.6975263343425417
trafficSource_campaign   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61446
[200]        valid_0's rmse: 1.60758
[300]        valid_0's rmse: 1.60468
[400]        valid_0's rmse: 1.60554
Early stopping, best iteration is:
[321]        valid_0's rmse: 1.60454
1.6266862621538862
trafficSource_campaign   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61365
[200]        valid_0's rmse: 1.60785
[300]        valid_0's rmse: 1.60516
[400]        valid_0's rmse: 1.60698
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60513
1.6278725154806037
trafficSource_campaign   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61554
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[200]	valid_0's rmse: 1.60759
[300]	valid_0's rmse: 1.60519
Early stopping, best iteration is:
[299]	valid_0's rmse: 1.60519
1.6268587048494498
trafficSource_campaign   3
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61414
[200]	valid_0's rmse: 1.60652
[300]	valid_0's rmse: 1.60527
[400]	valid_0's rmse: 1.60565
[500]	valid_0's rmse: 1.60705
Early stopping, best iteration is:
[429]	valid_0's rmse: 1.605
1.6260716946173193
trafficSource_campaign   4
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61446
[200]	valid_0's rmse: 1.60759
[300]	valid_0's rmse: 1.60557
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60547
1.6277123866391197
trafficSource_campaign   5
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61493
[200]	valid_0's rmse: 1.6097
[300]	valid_0's rmse: 1.6074
[400]	valid_0's rmse: 1.60912
Early stopping, best iteration is:
[314]	valid_0's rmse: 1.6071
1.6286599434974198
trafficSource_campaign   6
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61467
[200]	valid_0's rmse: 1.60676
[300]	valid_0's rmse: 1.60481
[400]	valid_0's rmse: 1.60654
Early stopping, best iteration is:
[304]	valid_0's rmse: 1.6047
1.6272897495544627
trafficSource_campaign   7
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61629
[200]	valid_0's rmse: 1.60814
[300]	valid_0's rmse: 1.6071
Early stopping, best iteration is:
[286]	valid_0's rmse: 1.60675
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1.6291648152313438
trafficSource_campaign   8
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61497
[200]        valid_0's rmse: 1.60719
[300]        valid_0's rmse: 1.60527
[400]        valid_0's rmse: 1.60604
Early stopping, best iteration is:
[335]        valid_0's rmse: 1.60483
1.6266588870588803
trafficSource_campaign   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61521
[200]        valid_0's rmse: 1.60836
[300]        valid_0's rmse: 1.606
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60593
1.6272241645640817
trafficSource_campaign   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61601
[200]        valid_0's rmse: 1.60883
[300]        valid_0's rmse: 1.6068
[400]        valid_0's rmse: 1.60708
Early stopping, best iteration is:
[300]        valid_0's rmse: 1.6068
1.6292311418348657
trafficSource_campaign   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61396
[200]        valid_0's rmse: 1.60733
[300]        valid_0's rmse: 1.60521
[400]        valid_0's rmse: 1.60685
Early stopping, best iteration is:
[315]        valid_0's rmse: 1.60476
1.6272610247512886
trafficSource_campaign   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61539
[200]        valid_0's rmse: 1.60785
[300]        valid_0's rmse: 1.6061
Early stopping, best iteration is:
[272]        valid_0's rmse: 1.60569
1.6282802582621028
trafficSource_campaign   13
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61429
[200]        valid_0's rmse: 1.609
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[300]	valid_0's rmse: 1.60726
Early stopping, best iteration is:
[264]	valid_0's rmse: 1.60709
1.6295962642561888
trafficSource_campaign   14
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61456
[200]	valid_0's rmse: 1.60841
[300]	valid_0's rmse: 1.60676
Early stopping, best iteration is:
[290]	valid_0's rmse: 1.60654
1.6285012806126946
trafficSource_campaign   15
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61432
[200]	valid_0's rmse: 1.60718
[300]	valid_0's rmse: 1.60574
[400]	valid_0's rmse: 1.60749
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60568
1.627858514677949
trafficSource_campaign   16
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61493
[200]	valid_0's rmse: 1.60791
[300]	valid_0's rmse: 1.60677
Early stopping, best iteration is:
[299]	valid_0's rmse: 1.60676
1.6283913948919644
trafficSource_campaign   17
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61613
[200]	valid_0's rmse: 1.60905
[300]	valid_0's rmse: 1.60778
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.60758
1.6290325218862347
trafficSource_campaign   18
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61517
[200]	valid_0's rmse: 1.60705
[300]	valid_0's rmse: 1.60553
[400]	valid_0's rmse: 1.60722
Early stopping, best iteration is:
[301]	valid_0's rmse: 1.60551
1.6269663314632579
trafficSource_campaign   19
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.61407
[200]        valid_0's rmse: 1.60725
[300]        valid_0's rmse: 1.60548
Early stopping, best iteration is:
[266]        valid_0's rmse: 1.60508
1.6276169434505467
trafficSource_campaign   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61643
[200]        valid_0's rmse: 1.60885
[300]        valid_0's rmse: 1.60765
Early stopping, best iteration is:
[293]        valid_0's rmse: 1.60756
1.6300701264367432
trafficSource_campaign   21
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61559
[200]        valid_0's rmse: 1.60685
[300]        valid_0's rmse: 1.60623
Early stopping, best iteration is:
[269]        valid_0's rmse: 1.60581
1.6279327532451981
trafficSource_campaign   22
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61461
[200]        valid_0's rmse: 1.60745
[300]        valid_0's rmse: 1.60546
[400]        valid_0's rmse: 1.60668
Early stopping, best iteration is:
[300]        valid_0's rmse: 1.60546
1.6285838457345236
trafficSource_campaign   23
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61622
[200]        valid_0's rmse: 1.60838
[300]        valid_0's rmse: 1.60615
[400]        valid_0's rmse: 1.60652
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.60603
1.6272288349022945
trafficSource_campaign   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6154
[200]        valid_0's rmse: 1.60951
[300]        valid_0's rmse: 1.60755
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.6072
1.630165499519173
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trafficSource_campaign   25
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6157
[200]        valid_0's rmse: 1.60772
[300]        valid_0's rmse: 1.60655
[400]        valid_0's rmse: 1.6066
Early stopping, best iteration is:
[336]        valid_0's rmse: 1.60616
1.6279338633738836
trafficSource_campaign   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61467
[200]        valid_0's rmse: 1.6077
[300]        valid_0's rmse: 1.60601
[400]        valid_0's rmse: 1.60699
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60596
1.627761461592214
trafficSource_campaign   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61494
[200]        valid_0's rmse: 1.6076
[300]        valid_0's rmse: 1.60584
[400]        valid_0's rmse: 1.60685
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.60545
1.6272299287620833
trafficSource_campaign   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6143
[200]        valid_0's rmse: 1.60759
[300]        valid_0's rmse: 1.60718
[400]        valid_0's rmse: 1.60753
Early stopping, best iteration is:
[327]        valid_0's rmse: 1.60691
1.6282488813467566
trafficSource_campaign   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61332
[200]        valid_0's rmse: 1.60773
[300]        valid_0's rmse: 1.6064
Early stopping, best iteration is:
[274]        valid_0's rmse: 1.60622
1.6285117893284697
trafficSource_campaign   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6147
[200]        valid_0's rmse: 1.60698
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[300]	valid_0's rmse: 1.60573
Early stopping, best iteration is:
[286]	valid_0's rmse: 1.60531
1.6268866860164783
trafficSource_campaign   31
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61585
[200]	valid_0's rmse: 1.60855
[300]	valid_0's rmse: 1.60774
[400]	valid_0's rmse: 1.60882
Early stopping, best iteration is:
[314]	valid_0's rmse: 1.60736
1.629845423275689
trafficSource_campaign   32
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61592
[200]	valid_0's rmse: 1.60725
[300]	valid_0's rmse: 1.60518
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60515
1.6273277569257727
trafficSource_campaign   33
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61575
[200]	valid_0's rmse: 1.60852
[300]	valid_0's rmse: 1.60588
[400]	valid_0's rmse: 1.60595
Early stopping, best iteration is:
[395]	valid_0's rmse: 1.60574
1.6270775900148058
trafficSource_campaign   34
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61413
[200]	valid_0's rmse: 1.60676
[300]	valid_0's rmse: 1.60588
Early stopping, best iteration is:
[226]	valid_0's rmse: 1.60548
1.6280096505985866
trafficSource_campaign   35
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61432
[200]	valid_0's rmse: 1.6086
[300]	valid_0's rmse: 1.60744
Early stopping, best iteration is:
[269]	valid_0's rmse: 1.60693
1.6282943649203059
trafficSource_campaign   36
Training until validation scores don't improve for 100 rounds.
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[100]	valid_0's rmse: 1.61496
[200]	valid_0's rmse: 1.6076
[300]	valid_0's rmse: 1.60654
[400]	valid_0's rmse: 1.60692
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60633
1.6280355675016254
trafficSource_campaign   37
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61449
[200]	valid_0's rmse: 1.60669
[300]	valid_0's rmse: 1.60632
Early stopping, best iteration is:
[285]	valid_0's rmse: 1.60579
1.6284642113218175
trafficSource_campaign   38
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61529
[200]	valid_0's rmse: 1.60752
[300]	valid_0's rmse: 1.6044
[400]	valid_0's rmse: 1.60545
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60415
1.62633640689187
trafficSource_campaign   39
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61463
[200]	valid_0's rmse: 1.60775
[300]	valid_0's rmse: 1.60513
[400]	valid_0's rmse: 1.60604
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60504
1.6262093126968773
trafficSource_campaign   40
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6139
[200]	valid_0's rmse: 1.60709
[300]	valid_0's rmse: 1.60535
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60516
1.6266651237011602
trafficSource_campaign   41
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61483
[200]	valid_0's rmse: 1.60708
[300]	valid_0's rmse: 1.60537
[400]	valid_0's rmse: 1.60628
Early stopping, best iteration is:
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[308]        valid_0's rmse: 1.60503
1.6271970910947473
trafficSource_campaign   42
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61613
[200]        valid_0's rmse: 1.60826
[300]        valid_0's rmse: 1.60687
[400]        valid_0's rmse: 1.60802
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.60685
1.6277932378549413
trafficSource_campaign   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61425
[200]        valid_0's rmse: 1.60753
[300]        valid_0's rmse: 1.60654
[400]        valid_0's rmse: 1.60684
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60636
1.6290204085318536
trafficSource_campaign   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61535
[200]        valid_0's rmse: 1.6088
[300]        valid_0's rmse: 1.6076
[400]        valid_0's rmse: 1.60868
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60738
1.6298374376421363
trafficSource_campaign   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61425
[200]        valid_0's rmse: 1.60788
[300]        valid_0's rmse: 1.60774
Early stopping, best iteration is:
[267]        valid_0's rmse: 1.60732
1.6286998004941948
trafficSource_campaign   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61427
[200]        valid_0's rmse: 1.6083
[300]        valid_0's rmse: 1.60758
[400]        valid_0's rmse: 1.60888
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60738
1.6300363173741736
trafficSource_campaign   47
Training until validation scores don't improve for 100 rounds.
```

```
[100]        valid_0's rmse: 1.61588
[200]        valid_0's rmse: 1.60792
[300]        valid_0's rmse: 1.60548
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60513
1.6273617361992478
trafficSource_campaign   48
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61376
[200]        valid_0's rmse: 1.60679
[300]        valid_0's rmse: 1.60505
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.60481
1.6271697537048586
trafficSource_campaign   49
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61479
[200]        valid_0's rmse: 1.60778
[300]        valid_0's rmse: 1.60705
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.60684
1.628317639333455
trafficSource_campaign   50
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61401
[200]        valid_0's rmse: 1.60789
[300]        valid_0's rmse: 1.60616
[400]        valid_0's rmse: 1.60709
Early stopping, best iteration is:
[335]        valid_0's rmse: 1.60584
1.6275521460071487
trafficSource_campaign   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61407
[200]        valid_0's rmse: 1.60688
[300]        valid_0's rmse: 1.60446
[400]        valid_0's rmse: 1.60467
Early stopping, best iteration is:
[384]        valid_0's rmse: 1.60419
1.6259857029243754
trafficSource_campaign   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61453
[200]        valid_0's rmse: 1.60779
[300]        valid_0's rmse: 1.60628
[400]        valid_0's rmse: 1.60686
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.60602
```

```
1.6285104112884523
trafficSource_campaign   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61428
[200]        valid_0's rmse: 1.60888
[300]        valid_0's rmse: 1.60651
[400]        valid_0's rmse: 1.60766
Early stopping, best iteration is:
[329]        valid_0's rmse: 1.60635
1.628256222532322
trafficSource_campaign   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61531
[200]        valid_0's rmse: 1.60834
[300]        valid_0's rmse: 1.60686
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60679
1.6284698825091182
trafficSource_campaign   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6142
[200]        valid_0's rmse: 1.60731
[300]        valid_0's rmse: 1.60582
[400]        valid_0's rmse: 1.60634
Early stopping, best iteration is:
[336]        valid_0's rmse: 1.60527
1.6273291428395524
trafficSource_campaign   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61472
[200]        valid_0's rmse: 1.60837
[300]        valid_0's rmse: 1.60654
Early stopping, best iteration is:
[275]        valid_0's rmse: 1.60633
1.6280093365002286
trafficSource_campaign   57
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61315
[200]        valid_0's rmse: 1.60666
[300]        valid_0's rmse: 1.60478
[400]        valid_0's rmse: 1.60623
Early stopping, best iteration is:
[308]        valid_0's rmse: 1.60461
1.6271933938375596
trafficSource_campaign   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61563
[200]        valid_0's rmse: 1.60857
```

```
[300]	valid_0's rmse: 1.60695
Early stopping, best iteration is:
[295]	valid_0's rmse: 1.60671
1.6288798142596934
trafficSource_campaign   59
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61634
[200]	valid_0's rmse: 1.60984
[300]	valid_0's rmse: 1.60719
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60712
1.6290935452122024
trafficSource_campaign   60
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61476
[200]	valid_0's rmse: 1.60737
[300]	valid_0's rmse: 1.60553
[400]	valid_0's rmse: 1.60665
Early stopping, best iteration is:
[306]	valid_0's rmse: 1.60544
1.6274190865307192
trafficSource_campaign   61
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61409
[200]	valid_0's rmse: 1.6065
[300]	valid_0's rmse: 1.60475
[400]	valid_0's rmse: 1.60607
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60463
1.6271109913562427
trafficSource_campaign   62
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61574
[200]	valid_0's rmse: 1.60831
[300]	valid_0's rmse: 1.60677
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60673
1.6287841640612817
trafficSource_campaign   63
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61437
[200]	valid_0's rmse: 1.60637
[300]	valid_0's rmse: 1.60405
[400]	valid_0's rmse: 1.60519
Early stopping, best iteration is:
[315]	valid_0's rmse: 1.60395
1.6259248017063272
trafficSource_campaign   64
```

```
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61339
[200]        valid_0's rmse: 1.60653
[300]        valid_0's rmse: 1.60543
Early stopping, best iteration is:
[290]        valid_0's rmse: 1.60522
1.627647586807492
trafficSource_campaign   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6152
[200]        valid_0's rmse: 1.60692
[300]        valid_0's rmse: 1.60513
Early stopping, best iteration is:
[289]        valid_0's rmse: 1.60471
1.6270256112514334
trafficSource_campaign   66
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61394
[200]        valid_0's rmse: 1.60784
[300]        valid_0's rmse: 1.60723
[400]        valid_0's rmse: 1.60718
Early stopping, best iteration is:
[386]        valid_0's rmse: 1.60653
1.6283533788404883
trafficSource_campaign   67
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61439
[200]        valid_0's rmse: 1.60753
[300]        valid_0's rmse: 1.60571
[400]        valid_0's rmse: 1.60736
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.6057
1.6264512511265297
trafficSource_campaign   68
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61626
[200]        valid_0's rmse: 1.60919
[300]        valid_0's rmse: 1.60646
[400]        valid_0's rmse: 1.608
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60632
1.6284684182746798
trafficSource_campaign   69
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61545
[200]        valid_0's rmse: 1.60852
[300]        valid_0's rmse: 1.60716
Early stopping, best iteration is:
```

```
[287]        valid_0's rmse: 1.60689
1.6287680092698391
trafficSource_campaign   70
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61543
[200]        valid_0's rmse: 1.60769
[300]        valid_0's rmse: 1.60747
Early stopping, best iteration is:
[240]        valid_0's rmse: 1.60697
1.629165716750808
trafficSource_campaign   71
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61521
[200]        valid_0's rmse: 1.60767
[300]        valid_0's rmse: 1.60648
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.60619
1.628794622043828
trafficSource_campaign   72
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61569
[200]        valid_0's rmse: 1.60887
[300]        valid_0's rmse: 1.60765
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.60758
1.629455009969746
trafficSource_campaign   73
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61426
[200]        valid_0's rmse: 1.60799
[300]        valid_0's rmse: 1.60635
[400]        valid_0's rmse: 1.60744
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60632
1.6275621739064379
trafficSource_campaign   74
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.616
[200]        valid_0's rmse: 1.60892
[300]        valid_0's rmse: 1.6069
Early stopping, best iteration is:
[288]        valid_0's rmse: 1.60671
1.6283987416743526
trafficSource_campaign   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61551
[200]        valid_0's rmse: 1.60934
[300]        valid_0's rmse: 1.60709
```

```
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60707
1.6291856037947179
trafficSource_campaign   76
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61382
[200]	valid_0's rmse: 1.60634
[300]	valid_0's rmse: 1.60549
Early stopping, best iteration is:
[274]	valid_0's rmse: 1.60523
1.627260560591948
trafficSource_campaign   77
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61485
[200]	valid_0's rmse: 1.60802
[300]	valid_0's rmse: 1.6066
Early stopping, best iteration is:
[285]	valid_0's rmse: 1.60634
1.6290409013212597
trafficSource_campaign   78
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61467
[200]	valid_0's rmse: 1.60768
[300]	valid_0's rmse: 1.60724
Early stopping, best iteration is:
[290]	valid_0's rmse: 1.60683
1.6292290476617246
trafficSource_campaign   79
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61475
[200]	valid_0's rmse: 1.60856
[300]	valid_0's rmse: 1.60657
Early stopping, best iteration is:
[293]	valid_0's rmse: 1.60648
1.6281942608332078
trafficSource_campaign   80
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61516
[200]	valid_0's rmse: 1.61067
[300]	valid_0's rmse: 1.60904
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60879
1.629830987339246
trafficSource_campaign   81
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61647
[200]	valid_0's rmse: 1.60796
[300]	valid_0's rmse: 1.60648
```

```
Early stopping, best iteration is:
[290]	valid_0's rmse: 1.60638
1.628428509065658
trafficSource_campaign   82
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61567
[200]	valid_0's rmse: 1.60766
[300]	valid_0's rmse: 1.60637
Early stopping, best iteration is:
[264]	valid_0's rmse: 1.60609
1.628114875946481
trafficSource_campaign   83
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6151
[200]	valid_0's rmse: 1.60779
[300]	valid_0's rmse: 1.60552
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60545
1.6273047931122955
trafficSource_campaign   84
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61551
[200]	valid_0's rmse: 1.60709
[300]	valid_0's rmse: 1.60675
[400]	valid_0's rmse: 1.60831
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60669
1.628948058518984
trafficSource_campaign   85
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61384
[200]	valid_0's rmse: 1.60928
[300]	valid_0's rmse: 1.60752
[400]	valid_0's rmse: 1.60951
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60722
1.629861426573618
trafficSource_campaign   86
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61521
[200]	valid_0's rmse: 1.60788
[300]	valid_0's rmse: 1.60611
[400]	valid_0's rmse: 1.6068
Early stopping, best iteration is:
[334]	valid_0's rmse: 1.60597
1.6285866107468254
trafficSource_campaign   87
Training until validation scores don't improve for 100 rounds.
```

```
[100]	valid_0's rmse: 1.61496
[200]	valid_0's rmse: 1.60823
[300]	valid_0's rmse: 1.60688
[400]	valid_0's rmse: 1.60818
Early stopping, best iteration is:
[307]	valid_0's rmse: 1.60668
1.6287482680245837
trafficSource_campaign   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61451
[200]	valid_0's rmse: 1.60806
[300]	valid_0's rmse: 1.60575
[400]	valid_0's rmse: 1.60681
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60549
1.627466879022464
trafficSource_campaign   89
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61551
[200]	valid_0's rmse: 1.60613
[300]	valid_0's rmse: 1.60402
[400]	valid_0's rmse: 1.60631
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60398
1.6262491021925685
trafficSource_campaign   90
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61483
[200]	valid_0's rmse: 1.6073
[300]	valid_0's rmse: 1.60645
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60636
1.6283123182205175
trafficSource_campaign   91
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61627
[200]	valid_0's rmse: 1.60782
[300]	valid_0's rmse: 1.60675
Early stopping, best iteration is:
[287]	valid_0's rmse: 1.60647
1.6281784541509126
trafficSource_campaign   92
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61552
[200]	valid_0's rmse: 1.60769
[300]	valid_0's rmse: 1.60622
[400]	valid_0's rmse: 1.60659
Early stopping, best iteration is:
```

```
[306]        valid_0's rmse: 1.60604
1.628044699638732
trafficSource_campaign   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61511
[200]        valid_0's rmse: 1.60845
[300]        valid_0's rmse: 1.60664
[400]        valid_0's rmse: 1.60585
[500]        valid_0's rmse: 1.60783
Early stopping, best iteration is:
[403]        valid_0's rmse: 1.60579
1.627138738327757
trafficSource_campaign   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61567
[200]        valid_0's rmse: 1.60825
[300]        valid_0's rmse: 1.60553
[400]        valid_0's rmse: 1.60575
Early stopping, best iteration is:
[337]        valid_0's rmse: 1.60475
1.6262310389087888
trafficSource_campaign   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61488
[200]        valid_0's rmse: 1.60711
[300]        valid_0's rmse: 1.60644
[400]        valid_0's rmse: 1.60696
Early stopping, best iteration is:
[319]        valid_0's rmse: 1.60595
1.6281533314813383
trafficSource_campaign   96
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61434
[200]        valid_0's rmse: 1.60756
[300]        valid_0's rmse: 1.60574
[400]        valid_0's rmse: 1.60673
Early stopping, best iteration is:
[335]        valid_0's rmse: 1.60561
1.627968875570156
trafficSource_campaign   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61459
[200]        valid_0's rmse: 1.60592
[300]        valid_0's rmse: 1.60575
[400]        valid_0's rmse: 1.60576
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.60497
1.6268626957643524
```

```
trafficSource_campaign   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61595
[200]        valid_0's rmse: 1.60838
[300]        valid_0's rmse: 1.60648
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.60642
1.6286707721764202
trafficSource_campaign   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61565
[200]        valid_0's rmse: 1.60918
[300]        valid_0's rmse: 1.60737
[400]        valid_0's rmse: 1.60848
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60719
1.6292242579289304
```

```
In [63]: print ("pval for totals_pageviews and trafficSource_campaign")
         pval1 = p_val
         print (pval1)
```

```
pval for totals_pageviews and trafficSource_campaign
[0.0, 0.79]
```

```
In [64]: base_rmse = 1.6288250113593938
         iter = 100
         p_val = []

         for column_perm in ["totals_hits", "visitID", "totals_newVisits", "geoNetwork_continer
         #for column_perm in ["totals_pageviews", "trafficSource_campaign"]:
             ans = []
             for i in range(iter):
                 print(column_perm," ",i)
                 train_permute = train_df.copy()
                 train_permute[column_perm] = np.random.permutation(train_permute[column_perm])
                 x, y = train_df.shape
                 x1 = 3 * int(x / 4)

                 dev_df = train_permute[0:x1]
                 val_df = train_permute[x1:x]

                 dev_X = dev_df
                 val_X = val_df

                 dev_y = np.log1p(dev_X["totals_transactionRevenue"].values)
```

```
                val_y = np.log1p(val_X["totals_transactionRevenue"].values)

                dev_X = dev_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId
                val_X = val_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId

                model, pred_val = run_lgb_perm(dev_X, dev_y, val_X, val_y)

                from sklearn import metrics
                pred_val[pred_val<0] = 0
                val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
                val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
                val_pred_df["PredictedRevenue"] = np.expm1(pred_val)
                val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "Pred
                print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionReve
                ans.append(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactio

            less_sum = sum(i <= base_rmse for i in ans)
            p_val.append(less_sum/iter)
```

```
totals_hits   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63955
[200]        valid_0's rmse: 1.63827
[300]        valid_0's rmse: 1.63873
Early stopping, best iteration is:
[246]        valid_0's rmse: 1.63782
1.6581963765435563
totals_hits   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63971
[200]        valid_0's rmse: 1.63812
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.63784
1.6586896120522647
totals_hits   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63965
[200]        valid_0's rmse: 1.63883
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63819
1.6596700273645464
totals_hits   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64063
[200]        valid_0's rmse: 1.63872
[300]        valid_0's rmse: 1.63904
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.63852
```

```
1.6590737782825022
totals_hits   4
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6393
[200]        valid_0's rmse: 1.63739
[300]        valid_0's rmse: 1.63768
Early stopping, best iteration is:
[237]        valid_0's rmse: 1.63698
1.65771115492575
totals_hits   5
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63971
[200]        valid_0's rmse: 1.63828
[300]        valid_0's rmse: 1.63899
Early stopping, best iteration is:
[230]        valid_0's rmse: 1.63803
1.658802786507439
totals_hits   6
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64096
[200]        valid_0's rmse: 1.63981
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63912
1.6607462863364593
totals_hits   7
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6401
[200]        valid_0's rmse: 1.63753
Early stopping, best iteration is:
[178]        valid_0's rmse: 1.63738
1.6578681595242344
totals_hits   8
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64012
[200]        valid_0's rmse: 1.63932
[300]        valid_0's rmse: 1.63949
Early stopping, best iteration is:
[226]        valid_0's rmse: 1.63906
1.6598788537405897
totals_hits   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64039
[200]        valid_0's rmse: 1.63931
Early stopping, best iteration is:
[162]        valid_0's rmse: 1.63879
1.6597852073620276
totals_hits   10
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.64064
[200]        valid_0's rmse: 1.63911
[300]        valid_0's rmse: 1.63981
Early stopping, best iteration is:
[248]        valid_0's rmse: 1.63867
1.6593017587695844
totals_hits   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63964
[200]        valid_0's rmse: 1.63821
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.63799
1.659439923307088
totals_hits   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63941
[200]        valid_0's rmse: 1.63831
Early stopping, best iteration is:
[167]        valid_0's rmse: 1.63778
1.6591729097912045
totals_hits   13
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64046
[200]        valid_0's rmse: 1.64022
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.6393
1.6609549098048624
totals_hits   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64057
[200]        valid_0's rmse: 1.639
[300]        valid_0's rmse: 1.63896
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.63822
1.6588936797519587
totals_hits   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64095
[200]        valid_0's rmse: 1.63925
[300]        valid_0's rmse: 1.6393
Early stopping, best iteration is:
[290]        valid_0's rmse: 1.639
1.6592825943932836
totals_hits   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6408
[200]        valid_0's rmse: 1.63949
Early stopping, best iteration is:
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[160]        valid_0's rmse: 1.63921
1.6598004142917817
totals_hits   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6396
[200]        valid_0's rmse: 1.63873
Early stopping, best iteration is:
[161]        valid_0's rmse: 1.63811
1.659907327908716
totals_hits   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64006
[200]        valid_0's rmse: 1.63871
[300]        valid_0's rmse: 1.63888
Early stopping, best iteration is:
[224]        valid_0's rmse: 1.63839
1.6590859378183387
totals_hits   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63939
[200]        valid_0's rmse: 1.63828
[300]        valid_0's rmse: 1.63856
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.63769
1.6589212714831114
totals_hits   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64011
[200]        valid_0's rmse: 1.63843
Early stopping, best iteration is:
[199]        valid_0's rmse: 1.63843
1.6590580844226008
totals_hits   21
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64126
[200]        valid_0's rmse: 1.6405
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63967
1.661256123425933
totals_hits   22
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64037
[200]        valid_0's rmse: 1.63896
[300]        valid_0's rmse: 1.63972
Early stopping, best iteration is:
[244]        valid_0's rmse: 1.6387
1.6585013105695334
totals_hits   23
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64071
[200]        valid_0's rmse: 1.63763
[300]        valid_0's rmse: 1.63786
Early stopping, best iteration is:
[237]        valid_0's rmse: 1.6374
1.6583363813214365
totals_hits   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64018
[200]        valid_0's rmse: 1.63909
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.6386
1.6595726308244438
totals_hits   25
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63976
[200]        valid_0's rmse: 1.63752
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.63742
1.6579445482934412
totals_hits   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64118
[200]        valid_0's rmse: 1.63896
[300]        valid_0's rmse: 1.6394
Early stopping, best iteration is:
[225]        valid_0's rmse: 1.63874
1.658896413205667
totals_hits   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63951
[200]        valid_0's rmse: 1.63789
[300]        valid_0's rmse: 1.63843
Early stopping, best iteration is:
[223]        valid_0's rmse: 1.63751
1.6582780557566321
totals_hits   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64093
[200]        valid_0's rmse: 1.63979
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.63958
1.6598070617717255
totals_hits   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64074
[200]        valid_0's rmse: 1.63949
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Early stopping, best iteration is:
[150]        valid_0's rmse: 1.63894
1.661191062072186
totals_hits   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64097
[200]        valid_0's rmse: 1.63958
[300]        valid_0's rmse: 1.64056
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63919
1.6603850685417227
totals_hits   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63992
[200]        valid_0's rmse: 1.63799
[300]        valid_0's rmse: 1.63885
Early stopping, best iteration is:
[213]        valid_0's rmse: 1.63771
1.6586952869741944
totals_hits   32
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63974
[200]        valid_0's rmse: 1.63949
Early stopping, best iteration is:
[151]        valid_0's rmse: 1.63889
1.6607333914961904
totals_hits   33
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63977
[200]        valid_0's rmse: 1.63898
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63868
1.6603367640342643
totals_hits   34
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64148
[200]        valid_0's rmse: 1.64003
[300]        valid_0's rmse: 1.64034
Early stopping, best iteration is:
[225]        valid_0's rmse: 1.63971
1.6595498226896224
totals_hits   35
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64001
[200]        valid_0's rmse: 1.6392
[300]        valid_0's rmse: 1.63858
Early stopping, best iteration is:
[295]        valid_0's rmse: 1.63838
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1.6589235798860622
totals_hits   36
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64075
[200]        valid_0's rmse: 1.63846
Early stopping, best iteration is:
[193]        valid_0's rmse: 1.63823
1.6580189159622674
totals_hits   37
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64048
[200]        valid_0's rmse: 1.63849
[300]        valid_0's rmse: 1.63945
Early stopping, best iteration is:
[212]        valid_0's rmse: 1.6382
1.659406496934629
totals_hits   38
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64102
[200]        valid_0's rmse: 1.63908
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63865
1.6594158432550636
totals_hits   39
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64152
[200]        valid_0's rmse: 1.63979
[300]        valid_0's rmse: 1.63972
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.63957
1.6597915442839077
totals_hits   40
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64048
[200]        valid_0's rmse: 1.6399
Early stopping, best iteration is:
[153]        valid_0's rmse: 1.63935
1.66137490676332
totals_hits   41
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64117
[200]        valid_0's rmse: 1.63872
[300]        valid_0's rmse: 1.63855
Early stopping, best iteration is:
[239]        valid_0's rmse: 1.6381
1.6589734691010087
totals_hits   42
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.64026
[200]        valid_0's rmse: 1.63841
[300]        valid_0's rmse: 1.63916
Early stopping, best iteration is:
[206]        valid_0's rmse: 1.63835
1.6593261241732455
totals_hits   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64089
[200]        valid_0's rmse: 1.63895
Early stopping, best iteration is:
[185]        valid_0's rmse: 1.63866
1.6600357864049005
totals_hits   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64039
[200]        valid_0's rmse: 1.63887
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.6385
1.6601274098430032
totals_hits   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63981
[200]        valid_0's rmse: 1.6378
[300]        valid_0's rmse: 1.63793
Early stopping, best iteration is:
[271]        valid_0's rmse: 1.63722
1.6578167077923072
totals_hits   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64032
[200]        valid_0's rmse: 1.63981
Early stopping, best iteration is:
[171]        valid_0's rmse: 1.63844
1.6601861773709838
totals_hits   47
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64009
[200]        valid_0's rmse: 1.63736
[300]        valid_0's rmse: 1.63776
Early stopping, best iteration is:
[201]        valid_0's rmse: 1.63733
1.6578192919610286
totals_hits   48
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63978
[200]        valid_0's rmse: 1.63899
Early stopping, best iteration is:
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[119]        valid_0's rmse: 1.63841
1.6603988240224312
totals_hits   49
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6402
[200]        valid_0's rmse: 1.63867
[300]        valid_0's rmse: 1.63879
Early stopping, best iteration is:
[242]        valid_0's rmse: 1.63811
1.6592490931787696
totals_hits   50
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64143
[200]        valid_0's rmse: 1.6398
Early stopping, best iteration is:
[153]        valid_0's rmse: 1.63953
1.6606230841105498
totals_hits   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63985
[200]        valid_0's rmse: 1.63887
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63858
1.6596140837466886
totals_hits   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63985
[200]        valid_0's rmse: 1.6393
Early stopping, best iteration is:
[187]        valid_0's rmse: 1.63899
1.6595240603314587
totals_hits   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63926
[200]        valid_0's rmse: 1.63735
Early stopping, best iteration is:
[193]        valid_0's rmse: 1.63719
1.6577996602965195
totals_hits   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64043
[200]        valid_0's rmse: 1.63819
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.63799
1.659286249729011
totals_hits   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64017
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[200]	valid_0's rmse: 1.63939
Early stopping, best iteration is:
[125]	valid_0's rmse: 1.6391
1.6607026356157955
totals_hits   56
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64038
[200]	valid_0's rmse: 1.63888
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.63867
1.6599647593598512
totals_hits   57
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64179
[200]	valid_0's rmse: 1.63985
[300]	valid_0's rmse: 1.64081
Early stopping, best iteration is:
[207]	valid_0's rmse: 1.63962
1.66048524320907
totals_hits   58
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64067
[200]	valid_0's rmse: 1.63885
Early stopping, best iteration is:
[171]	valid_0's rmse: 1.63863
1.6589283159527852
totals_hits   59
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63966
[200]	valid_0's rmse: 1.63776
Early stopping, best iteration is:
[173]	valid_0's rmse: 1.63756
1.6587597711725526
totals_hits   60
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64035
[200]	valid_0's rmse: 1.63833
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.63831
1.658600333668876
totals_hits   61
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6407
[200]	valid_0's rmse: 1.63929
[300]	valid_0's rmse: 1.64095
Early stopping, best iteration is:
[204]	valid_0's rmse: 1.6392
1.6602343598944116
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totals_hits   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63955
[200]        valid_0's rmse: 1.63841
[300]        valid_0's rmse: 1.63995
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63827
1.6594354778302394
totals_hits   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64062
[200]        valid_0's rmse: 1.63855
Early stopping, best iteration is:
[168]        valid_0's rmse: 1.63838
1.6596718360508533
totals_hits   64
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64064
[200]        valid_0's rmse: 1.64031
Early stopping, best iteration is:
[119]        valid_0's rmse: 1.63951
1.6608796715040839
totals_hits   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63998
[200]        valid_0's rmse: 1.63855
[300]        valid_0's rmse: 1.64052
Early stopping, best iteration is:
[203]        valid_0's rmse: 1.63853
1.6589846957247276
totals_hits   66
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6392
[200]        valid_0's rmse: 1.63781
Early stopping, best iteration is:
[174]        valid_0's rmse: 1.63742
1.6585579549981548
totals_hits   67
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64076
[200]        valid_0's rmse: 1.63803
[300]        valid_0's rmse: 1.63787
Early stopping, best iteration is:
[279]        valid_0's rmse: 1.63752
1.6579619623161488
totals_hits   68
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64031
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[200]        valid_0's rmse: 1.63812
[300]        valid_0's rmse: 1.63923
Early stopping, best iteration is:
[230]        valid_0's rmse: 1.63794
1.6590345725415467
totals_hits   69
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64029
[200]        valid_0's rmse: 1.63846
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.6384
1.658924880834794
totals_hits   70
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64081
[200]        valid_0's rmse: 1.6385
[300]        valid_0's rmse: 1.63944
Early stopping, best iteration is:
[224]        valid_0's rmse: 1.6384
1.6589547022353002
totals_hits   71
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64021
[200]        valid_0's rmse: 1.63806
[300]        valid_0's rmse: 1.63913
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63799
1.6586696287786469
totals_hits   72
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64028
[200]        valid_0's rmse: 1.63889
[300]        valid_0's rmse: 1.63975
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63863
1.6592684656687935
totals_hits   73
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64074
[200]        valid_0's rmse: 1.63924
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63883
1.660279663984504
totals_hits   74
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64006
[200]        valid_0's rmse: 1.63932
Early stopping, best iteration is:
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[152]        valid_0's rmse: 1.63837
1.6601558478383847
totals_hits   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63969
[200]        valid_0's rmse: 1.63858
[300]        valid_0's rmse: 1.63893
Early stopping, best iteration is:
[234]        valid_0's rmse: 1.63826
1.6595300575775087
totals_hits   76
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64107
[200]        valid_0's rmse: 1.63952
Early stopping, best iteration is:
[194]        valid_0's rmse: 1.63939
1.6604686719283908
totals_hits   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64012
[200]        valid_0's rmse: 1.63843
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63794
1.6594021319036765
totals_hits   78
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64015
[200]        valid_0's rmse: 1.63782
[300]        valid_0's rmse: 1.63868
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.63751
1.65856767006898
totals_hits   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64108
[200]        valid_0's rmse: 1.63982
[300]        valid_0's rmse: 1.64018
Early stopping, best iteration is:
[241]        valid_0's rmse: 1.63917
1.6590764565339986
totals_hits   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64059
[200]        valid_0's rmse: 1.63989
Early stopping, best iteration is:
[195]        valid_0's rmse: 1.63971
1.6612289288694335
totals_hits   81
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64068
[200]        valid_0's rmse: 1.63936
[300]        valid_0's rmse: 1.64061
Early stopping, best iteration is:
[236]        valid_0's rmse: 1.63904
1.659648344269839
totals_hits   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64029
[200]        valid_0's rmse: 1.63775
[300]        valid_0's rmse: 1.63873
Early stopping, best iteration is:
[244]        valid_0's rmse: 1.63745
1.65720655131367
totals_hits   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64065
[200]        valid_0's rmse: 1.63854
[300]        valid_0's rmse: 1.63993
Early stopping, best iteration is:
[207]        valid_0's rmse: 1.63841
1.6587374757561717
totals_hits   84
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63964
[200]        valid_0's rmse: 1.63773
Early stopping, best iteration is:
[190]        valid_0's rmse: 1.63756
1.6581374722111482
totals_hits   85
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63997
[200]        valid_0's rmse: 1.63852
[300]        valid_0's rmse: 1.63975
Early stopping, best iteration is:
[201]        valid_0's rmse: 1.63849
1.658969250132919
totals_hits   86
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63967
[200]        valid_0's rmse: 1.63892
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63851
1.65979726898884
totals_hits   87
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64045
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[200]	valid_0's rmse: 1.63989
Early stopping, best iteration is:
[154]	valid_0's rmse: 1.63926
1.660678980986641
totals_hits   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64105
[200]	valid_0's rmse: 1.63906
[300]	valid_0's rmse: 1.6396
Early stopping, best iteration is:
[202]	valid_0's rmse: 1.63887
1.6597170457642278
totals_hits   89
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63907
[200]	valid_0's rmse: 1.63753
Early stopping, best iteration is:
[188]	valid_0's rmse: 1.63727
1.6587001678129203
totals_hits   90
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64088
[200]	valid_0's rmse: 1.63879
Early stopping, best iteration is:
[194]	valid_0's rmse: 1.63875
1.659875611221985
totals_hits   91
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.63978
[200]	valid_0's rmse: 1.63779
[300]	valid_0's rmse: 1.63897
Early stopping, best iteration is:
[225]	valid_0's rmse: 1.63743
1.6581098964325762
totals_hits   92
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64107
[200]	valid_0's rmse: 1.63936
Early stopping, best iteration is:
[169]	valid_0's rmse: 1.63889
1.6600952642731772
totals_hits   93
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.64143
[200]	valid_0's rmse: 1.63946
Early stopping, best iteration is:
[166]	valid_0's rmse: 1.63924
1.6600290650568683
```

```
totals_hits   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64088
[200]        valid_0's rmse: 1.6392
[300]        valid_0's rmse: 1.64093
Early stopping, best iteration is:
[200]        valid_0's rmse: 1.6392
1.6595061227244703
totals_hits   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64015
[200]        valid_0's rmse: 1.63895
Early stopping, best iteration is:
[160]        valid_0's rmse: 1.63824
1.6589184659213312
totals_hits   96
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63999
[200]        valid_0's rmse: 1.63877
[300]        valid_0's rmse: 1.63888
Early stopping, best iteration is:
[213]        valid_0's rmse: 1.63856
1.6587876813226696
totals_hits   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64
[200]        valid_0's rmse: 1.638
[300]        valid_0's rmse: 1.63821
Early stopping, best iteration is:
[274]        valid_0's rmse: 1.63788
1.6577732305389095
totals_hits   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.63991
[200]        valid_0's rmse: 1.63843
[300]        valid_0's rmse: 1.63879
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.63808
1.6590182284128343
totals_hits   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.64021
[200]        valid_0's rmse: 1.63853
Early stopping, best iteration is:
[169]        valid_0's rmse: 1.63798
1.6588411081670387
visitID   0
```

```
    ---------------------------------------------------------------------------

    KeyError                                  Traceback (most recent call last)

    /anaconda3/lib/python3.6/site-packages/pandas/core/indexes/base.py in get_loc(self, key
   3062             try:
-> 3063                 return self._engine.get_loc(key)
   3064             except KeyError:


    pandas/_libs/index.pyx in pandas._libs.index.IndexEngine.get_loc()


    pandas/_libs/index.pyx in pandas._libs.index.IndexEngine.get_loc()


    pandas/_libs/hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHashTable.get


    pandas/_libs/hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHashTable.get


    KeyError: 'visitID'


During handling of the above exception, another exception occurred:


    KeyError                                  Traceback (most recent call last)

    <ipython-input-64-36978ef7a66e> in <module>()
      9         print(column_perm," ",i)
     10         train_permute = train_df.copy()
---> 11         train_permute[column_perm] = np.random.permutation(train_permute[column_per
     12         x, y = train_df.shape
     13         x1 = 3 * int(x / 4)


    /anaconda3/lib/python3.6/site-packages/pandas/core/frame.py in __getitem__(self, key)
   2683             return self._getitem_multilevel(key)
   2684         else:
-> 2685             return self._getitem_column(key)
   2686
   2687     def _getitem_column(self, key):


    /anaconda3/lib/python3.6/site-packages/pandas/core/frame.py in _getitem_column(self, ke
```

```
   2690         # get column
   2691         if self.columns.is_unique:
-> 2692             return self._get_item_cache(key)
   2693
   2694         # duplicate columns & possible reduce dimensionality


 /anaconda3/lib/python3.6/site-packages/pandas/core/generic.py in _get_item_cache(self,
   2484         res = cache.get(item)
   2485         if res is None:
-> 2486             values = self._data.get(item)
   2487             res = self._box_item_values(item, values)
   2488             cache[item] = res


 /anaconda3/lib/python3.6/site-packages/pandas/core/internals.py in get(self, item, fast
   4113
   4114             if not isna(item):
-> 4115                 loc = self.items.get_loc(item)
   4116             else:
   4117                 indexer = np.arange(len(self.items))[isna(self.items)]


 /anaconda3/lib/python3.6/site-packages/pandas/core/indexes/base.py in get_loc(self, key
   3063                 return self._engine.get_loc(key)
   3064             except KeyError:
-> 3065                 return self._engine.get_loc(self._maybe_cast_indexer(key))
   3066
   3067         indexer = self.get_indexer([key], method=method, tolerance=tolerance)


 pandas/_libs/index.pyx in pandas._libs.index.IndexEngine.get_loc()


 pandas/_libs/index.pyx in pandas._libs.index.IndexEngine.get_loc()


 pandas/_libs/hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHashTable.get


 pandas/_libs/hashtable_class_helper.pxi in pandas._libs.hashtable.PyObjectHashTable.get


 KeyError: 'visitID'
```

```
In [65]: print ("pval for totals_hits")
         pval2 = p_val
```

```
        print (pval2)

pval for totals_hits
[0.0]


In [66]: base_rmse = 1.6288250113593938
         iter = 100
         p_val = []

         for column_perm in ["visitId", "totals_newVisits", "geoNetwork_continent", "trafficSou
         #for column_perm in ["totals_pageviews", "trafficSource_campaign"]:
             ans = []
             for i in range(iter):
                 print(column_perm," ",i)
                 train_permute = train_df.copy()
                 train_permute[column_perm] = np.random.permutation(train_permute[column_perm])
                 x, y = train_df.shape
                 x1 = 3 * int(x / 4)

                 dev_df = train_permute[0:x1]
                 val_df = train_permute[x1:x]

                 dev_X = dev_df
                 val_X = val_df

                 dev_y = np.log1p(dev_X["totals_transactionRevenue"].values)
                 val_y = np.log1p(val_X["totals_transactionRevenue"].values)

                 dev_X = dev_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId
                 val_X = val_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId

                 model, pred_val = run_lgb_perm(dev_X, dev_y, val_X, val_y)

                 from sklearn import metrics
                 pred_val[pred_val<0] = 0
                 val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
                 val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
                 val_pred_df["PredictedRevenue"] = np.expm1(pred_val)
                 val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "Pred
                 print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionRev
                 ans.append(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactio

             less_sum = sum(i <= base_rmse for i in ans)
             p_val.append(less_sum/iter)

visitId   0
Training until validation scores don't improve for 100 rounds.
```

```
[100]        valid_0's rmse: 1.61874
[200]        valid_0's rmse: 1.61186
[300]        valid_0's rmse: 1.61079
[400]        valid_0's rmse: 1.61236
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.61077
1.6318902324996944
visitId   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61864
[200]        valid_0's rmse: 1.61235
[300]        valid_0's rmse: 1.61163
Early stopping, best iteration is:
[257]        valid_0's rmse: 1.61134
1.6329603860924704
visitId   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61831
[200]        valid_0's rmse: 1.61137
[300]        valid_0's rmse: 1.61071
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.61052
1.632458383551135
visitId   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61824
[200]        valid_0's rmse: 1.6138
[300]        valid_0's rmse: 1.61188
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.61183
1.634061356879683
visitId   4
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61828
[200]        valid_0's rmse: 1.61047
[300]        valid_0's rmse: 1.60995
Early stopping, best iteration is:
[269]        valid_0's rmse: 1.6097
1.6316937866942478
visitId   5
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61878
[200]        valid_0's rmse: 1.61326
[300]        valid_0's rmse: 1.61198
[400]        valid_0's rmse: 1.61214
Early stopping, best iteration is:
[378]        valid_0's rmse: 1.61178
1.6333636157559461
```

```
visitId   6
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61809
[200]        valid_0's rmse: 1.61281
[300]        valid_0's rmse: 1.61126
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.61113
1.633193720677367
visitId   7
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61862
[200]        valid_0's rmse: 1.6119
[300]        valid_0's rmse: 1.6113
Early stopping, best iteration is:
[258]        valid_0's rmse: 1.61065
1.6326833257389168
visitId   8
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61853
[200]        valid_0's rmse: 1.61214
[300]        valid_0's rmse: 1.61151
[400]        valid_0's rmse: 1.61177
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.61093
1.632609217572635
visitId   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61913
[200]        valid_0's rmse: 1.61152
[300]        valid_0's rmse: 1.61012
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60993
1.6316970234449948
visitId   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6183
[200]        valid_0's rmse: 1.61168
[300]        valid_0's rmse: 1.61151
[400]        valid_0's rmse: 1.61267
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.61128
1.6325227565916947
visitId   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61882
[200]        valid_0's rmse: 1.61268
[300]        valid_0's rmse: 1.61158
Early stopping, best iteration is:
```

```
[245]        valid_0's rmse: 1.61146
1.6335387090220326
visitId   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61818
[200]        valid_0's rmse: 1.61179
[300]        valid_0's rmse: 1.61033
Early stopping, best iteration is:
[262]        valid_0's rmse: 1.60985
1.63108894392559
visitId   13
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61776
[200]        valid_0's rmse: 1.61272
[300]        valid_0's rmse: 1.6112
[400]        valid_0's rmse: 1.61252
Early stopping, best iteration is:
[327]        valid_0's rmse: 1.61085
1.6318148426540853
visitId   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61829
[200]        valid_0's rmse: 1.6127
[300]        valid_0's rmse: 1.61146
Early stopping, best iteration is:
[288]        valid_0's rmse: 1.61122
1.6327497440107355
visitId   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61675
[200]        valid_0's rmse: 1.61068
[300]        valid_0's rmse: 1.61021
Early stopping, best iteration is:
[253]        valid_0's rmse: 1.60966
1.6318461870692527
visitId   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61845
[200]        valid_0's rmse: 1.6109
[300]        valid_0's rmse: 1.60939
[400]        valid_0's rmse: 1.60982
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60922
1.6300612257303966
visitId   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61845
[200]        valid_0's rmse: 1.61336
```

```
[300]	valid_0's rmse: 1.61164
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.61156
1.6331461989927456
visitId   18
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6187
[200]	valid_0's rmse: 1.61301
[300]	valid_0's rmse: 1.61176
[400]	valid_0's rmse: 1.61158
Early stopping, best iteration is:
[394]	valid_0's rmse: 1.61121
1.631659158656369
visitId   19
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.62001
[200]	valid_0's rmse: 1.61327
[300]	valid_0's rmse: 1.61208
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.612
1.6340061937021346
visitId   20
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61829
[200]	valid_0's rmse: 1.61155
[300]	valid_0's rmse: 1.61005
[400]	valid_0's rmse: 1.61083
Early stopping, best iteration is:
[307]	valid_0's rmse: 1.60969
1.6317313285928672
visitId   21
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61968
[200]	valid_0's rmse: 1.61306
[300]	valid_0's rmse: 1.6121
Early stopping, best iteration is:
[289]	valid_0's rmse: 1.61186
1.6338458979748498
visitId   22
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61806
[200]	valid_0's rmse: 1.61326
[300]	valid_0's rmse: 1.61274
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.61262
1.6340891752522442
visitId   23
Training until validation scores don't improve for 100 rounds.
```

```
[100]        valid_0's rmse: 1.62066
[200]        valid_0's rmse: 1.61334
[300]        valid_0's rmse: 1.61388
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.613
1.6356481110097898
visitId   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61823
[200]        valid_0's rmse: 1.61173
[300]        valid_0's rmse: 1.61073
[400]        valid_0's rmse: 1.61183
Early stopping, best iteration is:
[342]        valid_0's rmse: 1.61043
1.6315818868247434
visitId   25
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61785
[200]        valid_0's rmse: 1.6139
[300]        valid_0's rmse: 1.61206
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.61201
1.6339316328914555
visitId   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61705
[200]        valid_0's rmse: 1.61176
[300]        valid_0's rmse: 1.61219
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.61163
1.6340306331607968
visitId   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6189
[200]        valid_0's rmse: 1.61145
[300]        valid_0's rmse: 1.61142
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.61077
1.6332378499115612
visitId   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61965
[200]        valid_0's rmse: 1.61545
[300]        valid_0's rmse: 1.61423
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.61405
1.6353145033445626
visitId   29
```

```
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61867
[200]        valid_0's rmse: 1.61327
[300]        valid_0's rmse: 1.61182
Early stopping, best iteration is:
[249]        valid_0's rmse: 1.61168
1.6337554291458092
visitId   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61797
[200]        valid_0's rmse: 1.6116
[300]        valid_0's rmse: 1.61049
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.61027
1.6319102491095594
visitId   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61926
[200]        valid_0's rmse: 1.6122
[300]        valid_0's rmse: 1.61055
[400]        valid_0's rmse: 1.61181
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.61054
1.6323870397161369
visitId   32
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61903
[200]        valid_0's rmse: 1.61353
[300]        valid_0's rmse: 1.61276
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.61257
1.633772432562727
visitId   33
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61722
[200]        valid_0's rmse: 1.61117
[300]        valid_0's rmse: 1.60977
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.60911
1.6309293008684291
visitId   34
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61794
[200]        valid_0's rmse: 1.61042
[300]        valid_0's rmse: 1.60871
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60863
1.629324400747333
```

```
visitId   35
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61945
[200]        valid_0's rmse: 1.61256
[300]        valid_0's rmse: 1.61033
[400]        valid_0's rmse: 1.61198
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.61015
1.6319142823336994
visitId   36
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61678
[200]        valid_0's rmse: 1.61
[300]        valid_0's rmse: 1.6095
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.60913
1.6317190687340586
visitId   37
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61972
[200]        valid_0's rmse: 1.61457
[300]        valid_0's rmse: 1.61377
[400]        valid_0's rmse: 1.61465
Early stopping, best iteration is:
[326]        valid_0's rmse: 1.61352
1.6351695789611636
visitId   38
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61833
[200]        valid_0's rmse: 1.61155
[300]        valid_0's rmse: 1.61106
[400]        valid_0's rmse: 1.61224
Early stopping, best iteration is:
[309]        valid_0's rmse: 1.61084
1.6321257550352757
visitId   39
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61716
[200]        valid_0's rmse: 1.61239
[300]        valid_0's rmse: 1.6116
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.61136
1.6334765357129615
visitId   40
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61885
[200]        valid_0's rmse: 1.61246
[300]        valid_0's rmse: 1.61168
```

```
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.61154
1.633995696408148
visitId   41
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61882
[200]        valid_0's rmse: 1.61161
[300]        valid_0's rmse: 1.61119
[400]        valid_0's rmse: 1.6114
Early stopping, best iteration is:
[371]        valid_0's rmse: 1.61094
1.6327208270913343
visitId   42
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.619
[200]        valid_0's rmse: 1.61298
Early stopping, best iteration is:
[199]        valid_0's rmse: 1.61286
1.6344097727829539
visitId   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61854
[200]        valid_0's rmse: 1.6116
[300]        valid_0's rmse: 1.6104
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.61032
1.631500921664443
visitId   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61735
[200]        valid_0's rmse: 1.61028
[300]        valid_0's rmse: 1.60981
[400]        valid_0's rmse: 1.61077
Early stopping, best iteration is:
[336]        valid_0's rmse: 1.60979
1.6305247254510307
visitId   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61721
[200]        valid_0's rmse: 1.6115
[300]        valid_0's rmse: 1.61061
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.61041
1.6318600601916606
visitId   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61947
[200]        valid_0's rmse: 1.61436
```

```
[300]	valid_0's rmse: 1.6132
Early stopping, best iteration is:
[256]	valid_0's rmse: 1.61295
1.6339924969857358
visitId   47
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6195
[200]	valid_0's rmse: 1.61262
[300]	valid_0's rmse: 1.61178
[400]	valid_0's rmse: 1.61295
Early stopping, best iteration is:
[326]	valid_0's rmse: 1.61156
1.6333912398255477
visitId   48
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61789
[200]	valid_0's rmse: 1.61232
[300]	valid_0's rmse: 1.61242
Early stopping, best iteration is:
[207]	valid_0's rmse: 1.61195
1.634047140756213
visitId   49
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61809
[200]	valid_0's rmse: 1.61109
[300]	valid_0's rmse: 1.60992
[400]	valid_0's rmse: 1.61082
Early stopping, best iteration is:
[306]	valid_0's rmse: 1.60959
1.6314658011871825
visitId   50
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61833
[200]	valid_0's rmse: 1.61163
[300]	valid_0's rmse: 1.61067
Early stopping, best iteration is:
[268]	valid_0's rmse: 1.61039
1.6315487372763149
visitId   51
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61786
[200]	valid_0's rmse: 1.60991
[300]	valid_0's rmse: 1.60946
Early stopping, best iteration is:
[285]	valid_0's rmse: 1.60913
1.6308500536693056
visitId   52
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.61664
[200]        valid_0's rmse: 1.61094
[300]        valid_0's rmse: 1.6106
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.61007
1.6321987615268274
visitId   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61874
[200]        valid_0's rmse: 1.6133
[300]        valid_0's rmse: 1.61128
[400]        valid_0's rmse: 1.61193
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.61128
1.632949698644953
visitId   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61865
[200]        valid_0's rmse: 1.61187
[300]        valid_0's rmse: 1.61042
[400]        valid_0's rmse: 1.61134
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.61033
1.6321651875011582
visitId   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61775
[200]        valid_0's rmse: 1.61174
[300]        valid_0's rmse: 1.61073
Early stopping, best iteration is:
[289]        valid_0's rmse: 1.61059
1.6317418568588091
visitId   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61929
[200]        valid_0's rmse: 1.61232
[300]        valid_0's rmse: 1.61169
[400]        valid_0's rmse: 1.61261
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.61161
1.633110855855907
visitId   57
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.62061
[200]        valid_0's rmse: 1.61454
[300]        valid_0's rmse: 1.61416
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.61376
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1.6342938916792207
visitId   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61763
[200]        valid_0's rmse: 1.61102
[300]        valid_0's rmse: 1.60991
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60979
1.6315042404320605
visitId   59
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61906
[200]        valid_0's rmse: 1.61216
[300]        valid_0's rmse: 1.61138
Early stopping, best iteration is:
[267]        valid_0's rmse: 1.61109
1.633067726855477
visitId   60
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6178
[200]        valid_0's rmse: 1.61143
[300]        valid_0's rmse: 1.61068
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.6106
1.6324154212850464
visitId   61
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61949
[200]        valid_0's rmse: 1.61199
[300]        valid_0's rmse: 1.61146
Early stopping, best iteration is:
[234]        valid_0's rmse: 1.61141
1.6337572615882823
visitId   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61813
[200]        valid_0's rmse: 1.61308
[300]        valid_0's rmse: 1.61189
Early stopping, best iteration is:
[256]        valid_0's rmse: 1.61167
1.6336357555574659
visitId   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61858
[200]        valid_0's rmse: 1.61182
[300]        valid_0's rmse: 1.60958
[400]        valid_0's rmse: 1.61095
Early stopping, best iteration is:
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[303]        valid_0's rmse: 1.60938
1.630442688812988
visitId   64
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61877
[200]        valid_0's rmse: 1.61124
[300]        valid_0's rmse: 1.6093
[400]        valid_0's rmse: 1.60991
Early stopping, best iteration is:
[361]        valid_0's rmse: 1.60892
1.6311351223674024
visitId   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61939
[200]        valid_0's rmse: 1.61356
[300]        valid_0's rmse: 1.61292
Early stopping, best iteration is:
[247]        valid_0's rmse: 1.61266
1.6347809585325694
visitId   66
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61813
[200]        valid_0's rmse: 1.61284
[300]        valid_0's rmse: 1.61097
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.61085
1.6322319333635513
visitId   67
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61706
[200]        valid_0's rmse: 1.61126
[300]        valid_0's rmse: 1.60949
[400]        valid_0's rmse: 1.61004
Early stopping, best iteration is:
[300]        valid_0's rmse: 1.60949
1.6317376456192367
visitId   68
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61861
[200]        valid_0's rmse: 1.6123
[300]        valid_0's rmse: 1.61289
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.61194
1.6344542514000613
visitId   69
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61655
[200]        valid_0's rmse: 1.60974
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[300]	valid_0's rmse: 1.60922
Early stopping, best iteration is:
[259]	valid_0's rmse: 1.60897
1.6302293117422322
visitId   70
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61762
[200]	valid_0's rmse: 1.61075
[300]	valid_0's rmse: 1.6091
[400]	valid_0's rmse: 1.60936
Early stopping, best iteration is:
[358]	valid_0's rmse: 1.60863
1.630345638422814
visitId   71
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61791
[200]	valid_0's rmse: 1.61198
[300]	valid_0's rmse: 1.6108
[400]	valid_0's rmse: 1.61167
Early stopping, best iteration is:
[328]	valid_0's rmse: 1.61043
1.6314145641845068
visitId   72
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6192
[200]	valid_0's rmse: 1.61206
[300]	valid_0's rmse: 1.61104
[400]	valid_0's rmse: 1.61079
Early stopping, best iteration is:
[384]	valid_0's rmse: 1.61069
1.6329147941355984
visitId   73
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61851
[200]	valid_0's rmse: 1.61243
[300]	valid_0's rmse: 1.61119
[400]	valid_0's rmse: 1.61223
Early stopping, best iteration is:
[364]	valid_0's rmse: 1.61105
1.6327046786012243
visitId   74
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61746
[200]	valid_0's rmse: 1.61079
[300]	valid_0's rmse: 1.61124
Early stopping, best iteration is:
[202]	valid_0's rmse: 1.61055
1.6330781667868126
```

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visitId   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6172
[200]        valid_0's rmse: 1.61122
[300]        valid_0's rmse: 1.60991
[400]        valid_0's rmse: 1.60999
Early stopping, best iteration is:
[363]        valid_0's rmse: 1.60924
1.6306707954033164
visitId   76
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61708
[200]        valid_0's rmse: 1.6109
Early stopping, best iteration is:
[199]        valid_0's rmse: 1.61073
1.6327626643908841
visitId   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61889
[200]        valid_0's rmse: 1.61298
[300]        valid_0's rmse: 1.61313
Early stopping, best iteration is:
[202]        valid_0's rmse: 1.61242
1.635270152245707
visitId   78
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61885
[200]        valid_0's rmse: 1.61217
[300]        valid_0's rmse: 1.61044
[400]        valid_0's rmse: 1.61184
Early stopping, best iteration is:
[326]        valid_0's rmse: 1.61034
1.631935896815351
visitId   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61858
[200]        valid_0's rmse: 1.61144
[300]        valid_0's rmse: 1.61235
Early stopping, best iteration is:
[200]        valid_0's rmse: 1.61144
1.6329764342309208
visitId   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61797
[200]        valid_0's rmse: 1.61197
[300]        valid_0's rmse: 1.61054
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.61012
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1.6310716106511842
visitId   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61918
[200]        valid_0's rmse: 1.61279
[300]        valid_0's rmse: 1.61155
[400]        valid_0's rmse: 1.61232
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.61122
1.6326801872797259
visitId   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61773
[200]        valid_0's rmse: 1.6118
[300]        valid_0's rmse: 1.61057
[400]        valid_0's rmse: 1.6108
Early stopping, best iteration is:
[309]        valid_0's rmse: 1.61033
1.6317874695344379
visitId   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61876
[200]        valid_0's rmse: 1.61128
[300]        valid_0's rmse: 1.6096
[400]        valid_0's rmse: 1.61024
Early stopping, best iteration is:
[334]        valid_0's rmse: 1.60914
1.6303584737960375
visitId   84
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61852
[200]        valid_0's rmse: 1.6128
[300]        valid_0's rmse: 1.61132
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.61116
1.6329892813624023
visitId   85
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61838
[200]        valid_0's rmse: 1.6108
[300]        valid_0's rmse: 1.61018
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.61013
1.6323962799488123
visitId   86
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61787
[200]        valid_0's rmse: 1.61205
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[300]	valid_0's rmse: 1.61085
Early stopping, best iteration is:
[299]	valid_0's rmse: 1.61083
1.632072806130889
visitId   87
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61843
[200]	valid_0's rmse: 1.61156
[300]	valid_0's rmse: 1.61116
[400]	valid_0's rmse: 1.61138
Early stopping, best iteration is:
[382]	valid_0's rmse: 1.61072
1.6321735772237331
visitId   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61951
[200]	valid_0's rmse: 1.61254
[300]	valid_0's rmse: 1.61166
[400]	valid_0's rmse: 1.61342
Early stopping, best iteration is:
[323]	valid_0's rmse: 1.61153
1.6321782555838886
visitId   89
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61798
[200]	valid_0's rmse: 1.61195
[300]	valid_0's rmse: 1.61163
Early stopping, best iteration is:
[250]	valid_0's rmse: 1.61032
1.6325631381098755
visitId   90
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61871
[200]	valid_0's rmse: 1.61342
[300]	valid_0's rmse: 1.61194
Early stopping, best iteration is:
[273]	valid_0's rmse: 1.6114
1.6325530813008742
visitId   91
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61915
[200]	valid_0's rmse: 1.61322
[300]	valid_0's rmse: 1.61221
Early stopping, best iteration is:
[262]	valid_0's rmse: 1.61183
1.6339727821644152
visitId   92
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.61751
[200]        valid_0's rmse: 1.6112
[300]        valid_0's rmse: 1.60883
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60878
1.630375517364121
visitId   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61955
[200]        valid_0's rmse: 1.61242
[300]        valid_0's rmse: 1.61153
[400]        valid_0's rmse: 1.61275
Early stopping, best iteration is:
[315]        valid_0's rmse: 1.6114
1.6332351249796342
visitId   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61922
[200]        valid_0's rmse: 1.61252
[300]        valid_0's rmse: 1.61139
[400]        valid_0's rmse: 1.61232
Early stopping, best iteration is:
[320]        valid_0's rmse: 1.61128
1.6323583645786948
visitId   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61959
[200]        valid_0's rmse: 1.61203
[300]        valid_0's rmse: 1.61121
[400]        valid_0's rmse: 1.613
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.61091
1.633337320698713
visitId   96
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.62023
[200]        valid_0's rmse: 1.61294
[300]        valid_0's rmse: 1.61234
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.61228
1.6339594085897122
visitId   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61865
[200]        valid_0's rmse: 1.61119
[300]        valid_0's rmse: 1.61147
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.61088
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1.6331451820179088
visitId   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61771
[200]        valid_0's rmse: 1.612
[300]        valid_0's rmse: 1.61178
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.61132
1.6330723001212948
visitId   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61845
[200]        valid_0's rmse: 1.6119
[300]        valid_0's rmse: 1.61146
Early stopping, best iteration is:
[229]        valid_0's rmse: 1.61134
1.6336832488152448
totals_newVisits   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61455
[200]        valid_0's rmse: 1.60731
[300]        valid_0's rmse: 1.6059
[400]        valid_0's rmse: 1.60601
Early stopping, best iteration is:
[360]        valid_0's rmse: 1.60515
1.6274320789351469
totals_newVisits   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61529
[200]        valid_0's rmse: 1.60831
[300]        valid_0's rmse: 1.60762
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.60707
1.629823688096823
totals_newVisits   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61505
[200]        valid_0's rmse: 1.60773
[300]        valid_0's rmse: 1.60533
[400]        valid_0's rmse: 1.60686
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60526
1.627275142586443
totals_newVisits   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61444
[200]        valid_0's rmse: 1.60714
[300]        valid_0's rmse: 1.60615
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[400]	valid_0's rmse: 1.60614
Early stopping, best iteration is:
[314]	valid_0's rmse: 1.60557
1.6278359137129508
totals_newVisits   4
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61523
[200]	valid_0's rmse: 1.6078
[300]	valid_0's rmse: 1.60625
[400]	valid_0's rmse: 1.60713
Early stopping, best iteration is:
[301]	valid_0's rmse: 1.60624
1.6283797183587323
totals_newVisits   5
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61475
[200]	valid_0's rmse: 1.60732
[300]	valid_0's rmse: 1.60613
[400]	valid_0's rmse: 1.60736
Early stopping, best iteration is:
[306]	valid_0's rmse: 1.6058
1.628572791758939
totals_newVisits   6
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61516
[200]	valid_0's rmse: 1.60873
[300]	valid_0's rmse: 1.60683
Early stopping, best iteration is:
[293]	valid_0's rmse: 1.60653
1.628421153110338
totals_newVisits   7
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61386
[200]	valid_0's rmse: 1.60763
[300]	valid_0's rmse: 1.60538
[400]	valid_0's rmse: 1.60519
Early stopping, best iteration is:
[305]	valid_0's rmse: 1.60499
1.627167446436141
totals_newVisits   8
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61403
[200]	valid_0's rmse: 1.60799
[300]	valid_0's rmse: 1.60593
[400]	valid_0's rmse: 1.60834
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60587
1.6284470445935963
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totals_newVisits   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61502
[200]        valid_0's rmse: 1.60894
[300]        valid_0's rmse: 1.6081
Early stopping, best iteration is:
[226]        valid_0's rmse: 1.60757
1.6303360073000186
totals_newVisits   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61314
[200]        valid_0's rmse: 1.60528
[300]        valid_0's rmse: 1.60416
[400]        valid_0's rmse: 1.60473
Early stopping, best iteration is:
[313]        valid_0's rmse: 1.60386
1.626425225666219
totals_newVisits   11
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61454
[200]        valid_0's rmse: 1.60782
[300]        valid_0's rmse: 1.60654
[400]        valid_0's rmse: 1.60722
Early stopping, best iteration is:
[324]        valid_0's rmse: 1.60633
1.6283504688062391
totals_newVisits   12
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6145
[200]        valid_0's rmse: 1.60773
[300]        valid_0's rmse: 1.60577
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.60523
1.6273325366631595
totals_newVisits   13
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6138
[200]        valid_0's rmse: 1.60671
[300]        valid_0's rmse: 1.60563
[400]        valid_0's rmse: 1.60685
Early stopping, best iteration is:
[321]        valid_0's rmse: 1.60532
1.6274591171814734
totals_newVisits   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61413
[200]        valid_0's rmse: 1.60693
[300]        valid_0's rmse: 1.60526
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[400]        valid_0's rmse: 1.6065
Early stopping, best iteration is:
[309]        valid_0's rmse: 1.6052
1.6257587448933537
totals_newVisits   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61367
[200]        valid_0's rmse: 1.60575
[300]        valid_0's rmse: 1.60489
[400]        valid_0's rmse: 1.60557
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60484
1.6278058122668837
totals_newVisits   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61669
[200]        valid_0's rmse: 1.60791
[300]        valid_0's rmse: 1.60695
Early stopping, best iteration is:
[266]        valid_0's rmse: 1.60668
1.6281416655774368
totals_newVisits   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61485
[200]        valid_0's rmse: 1.61005
[300]        valid_0's rmse: 1.60946
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60931
1.6311403645153786
totals_newVisits   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61326
[200]        valid_0's rmse: 1.60665
[300]        valid_0's rmse: 1.60547
Early stopping, best iteration is:
[259]        valid_0's rmse: 1.60508
1.6277490735745674
totals_newVisits   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61448
[200]        valid_0's rmse: 1.60753
[300]        valid_0's rmse: 1.60565
Early stopping, best iteration is:
[288]        valid_0's rmse: 1.60545
1.6280115437715323
totals_newVisits   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61546
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[200]	valid_0's rmse: 1.60939
[300]	valid_0's rmse: 1.6084
Early stopping, best iteration is:
[262]	valid_0's rmse: 1.60807
1.6298726480490675
totals_newVisits   21
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61497
[200]	valid_0's rmse: 1.60757
[300]	valid_0's rmse: 1.60723
[400]	valid_0's rmse: 1.6085
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60723
1.6292539128827075
totals_newVisits   22
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61458
[200]	valid_0's rmse: 1.60746
[300]	valid_0's rmse: 1.60545
[400]	valid_0's rmse: 1.60599
Early stopping, best iteration is:
[326]	valid_0's rmse: 1.60515
1.6271084062213792
totals_newVisits   23
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61641
[200]	valid_0's rmse: 1.61004
[300]	valid_0's rmse: 1.60834
[400]	valid_0's rmse: 1.6103
Early stopping, best iteration is:
[321]	valid_0's rmse: 1.60777
1.6291009081534027
totals_newVisits   24
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61406
[200]	valid_0's rmse: 1.60775
[300]	valid_0's rmse: 1.60632
[400]	valid_0's rmse: 1.60677
Early stopping, best iteration is:
[369]	valid_0's rmse: 1.60621
1.627845047460162
totals_newVisits   25
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61435
[200]	valid_0's rmse: 1.60689
[300]	valid_0's rmse: 1.60554
[400]	valid_0's rmse: 1.60636
Early stopping, best iteration is:
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[317]        valid_0's rmse: 1.60528
1.6276734805963624
totals_newVisits   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61625
[200]        valid_0's rmse: 1.60835
[300]        valid_0's rmse: 1.60722
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60685
1.629065404851213
totals_newVisits   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61341
[200]        valid_0's rmse: 1.60656
[300]        valid_0's rmse: 1.60582
[400]        valid_0's rmse: 1.60699
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.60548
1.627479827903906
totals_newVisits   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61518
[200]        valid_0's rmse: 1.60884
[300]        valid_0's rmse: 1.60721
[400]        valid_0's rmse: 1.6081
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60694
1.6290985583252227
totals_newVisits   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61449
[200]        valid_0's rmse: 1.60878
[300]        valid_0's rmse: 1.60876
Early stopping, best iteration is:
[240]        valid_0's rmse: 1.60774
1.6295398714690486
totals_newVisits   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61532
[200]        valid_0's rmse: 1.60798
[300]        valid_0's rmse: 1.60633
[400]        valid_0's rmse: 1.60721
Early stopping, best iteration is:
[332]        valid_0's rmse: 1.60597
1.6274869889213421
totals_newVisits   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61485
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[200]	valid_0's rmse: 1.60805
[300]	valid_0's rmse: 1.60588
[400]	valid_0's rmse: 1.60677
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60584
1.6271439861681671
totals_newVisits   32
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61447
[200]	valid_0's rmse: 1.60674
[300]	valid_0's rmse: 1.60594
[400]	valid_0's rmse: 1.60729
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60589
1.6283773472565062
totals_newVisits   33
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61373
[200]	valid_0's rmse: 1.60608
Early stopping, best iteration is:
[195]	valid_0's rmse: 1.606
1.6290771594393634
totals_newVisits   34
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61382
[200]	valid_0's rmse: 1.60683
[300]	valid_0's rmse: 1.60643
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60632
1.6292023645242135
totals_newVisits   35
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61485
[200]	valid_0's rmse: 1.60735
[300]	valid_0's rmse: 1.60612
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60596
1.6283856743096685
totals_newVisits   36
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6138
[200]	valid_0's rmse: 1.6073
[300]	valid_0's rmse: 1.60622
Early stopping, best iteration is:
[289]	valid_0's rmse: 1.60585
1.628363040398834
totals_newVisits   37
Training until validation scores don't improve for 100 rounds.
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[100]	valid_0's rmse: 1.61521
[200]	valid_0's rmse: 1.60935
[300]	valid_0's rmse: 1.6079
[400]	valid_0's rmse: 1.60878
Early stopping, best iteration is:
[317]	valid_0's rmse: 1.60768
1.6294248257671067
totals_newVisits   38
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61392
[200]	valid_0's rmse: 1.60632
[300]	valid_0's rmse: 1.60421
[400]	valid_0's rmse: 1.60634
Early stopping, best iteration is:
[314]	valid_0's rmse: 1.60389
1.6266400914355998
totals_newVisits   39
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6143
[200]	valid_0's rmse: 1.60707
[300]	valid_0's rmse: 1.60626
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60614
1.6286591540837534
totals_newVisits   40
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61451
[200]	valid_0's rmse: 1.60766
[300]	valid_0's rmse: 1.60553
Early stopping, best iteration is:
[288]	valid_0's rmse: 1.60526
1.6271301183473166
totals_newVisits   41
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6147
[200]	valid_0's rmse: 1.60725
[300]	valid_0's rmse: 1.6064
Early stopping, best iteration is:
[262]	valid_0's rmse: 1.60573
1.6280679321472529
totals_newVisits   42
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61526
[200]	valid_0's rmse: 1.60689
[300]	valid_0's rmse: 1.6053
[400]	valid_0's rmse: 1.60584
Early stopping, best iteration is:
[320]	valid_0's rmse: 1.60462
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1.6261883201516514
totals_newVisits   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61408
[200]        valid_0's rmse: 1.60633
[300]        valid_0's rmse: 1.60461
[400]        valid_0's rmse: 1.60481
Early stopping, best iteration is:
[306]        valid_0's rmse: 1.60442
1.6267923952381076
totals_newVisits   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6147
[200]        valid_0's rmse: 1.60794
[300]        valid_0's rmse: 1.60677
[400]        valid_0's rmse: 1.60808
Early stopping, best iteration is:
[324]        valid_0's rmse: 1.60621
1.62801168041056
totals_newVisits   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61471
[200]        valid_0's rmse: 1.60814
[300]        valid_0's rmse: 1.60633
Early stopping, best iteration is:
[274]        valid_0's rmse: 1.60626
1.6283250407124814
totals_newVisits   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61459
[200]        valid_0's rmse: 1.60748
[300]        valid_0's rmse: 1.60592
[400]        valid_0's rmse: 1.60732
Early stopping, best iteration is:
[334]        valid_0's rmse: 1.60536
1.6273760314900918
totals_newVisits   47
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61373
[200]        valid_0's rmse: 1.60692
[300]        valid_0's rmse: 1.60468
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.6046
1.6269499845533486
totals_newVisits   48
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61483
[200]        valid_0's rmse: 1.60756
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[300]	valid_0's rmse: 1.60587
[400]	valid_0's rmse: 1.60709
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60544
1.6274806026824145
totals_newVisits   49
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61621
[200]	valid_0's rmse: 1.60824
[300]	valid_0's rmse: 1.60795
Early stopping, best iteration is:
[266]	valid_0's rmse: 1.60745
1.6303485208051316
totals_newVisits   50
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61488
[200]	valid_0's rmse: 1.60841
[300]	valid_0's rmse: 1.60686
Early stopping, best iteration is:
[273]	valid_0's rmse: 1.60647
1.6284440893533016
totals_newVisits   51
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61539
[200]	valid_0's rmse: 1.60888
[300]	valid_0's rmse: 1.60724
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60715
1.6291350286085027
totals_newVisits   52
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61553
[200]	valid_0's rmse: 1.60737
[300]	valid_0's rmse: 1.60581
[400]	valid_0's rmse: 1.60715
Early stopping, best iteration is:
[305]	valid_0's rmse: 1.60565
1.628381000181784
totals_newVisits   53
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61496
[200]	valid_0's rmse: 1.60794
[300]	valid_0's rmse: 1.60697
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60688
1.6292481493040039
totals_newVisits   54
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.61458
[200]        valid_0's rmse: 1.6076
[300]        valid_0's rmse: 1.60608
[400]        valid_0's rmse: 1.60764
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60601
1.6278611738863464
totals_newVisits   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61404
[200]        valid_0's rmse: 1.60686
[300]        valid_0's rmse: 1.60516
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.6051
1.628033139552096
totals_newVisits   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61495
[200]        valid_0's rmse: 1.60686
[300]        valid_0's rmse: 1.60558
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60532
1.6269768167152543
totals_newVisits   57
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61468
[200]        valid_0's rmse: 1.60597
[300]        valid_0's rmse: 1.60507
[400]        valid_0's rmse: 1.60654
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60499
1.6275628120695633
totals_newVisits   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61402
[200]        valid_0's rmse: 1.60752
[300]        valid_0's rmse: 1.60711
[400]        valid_0's rmse: 1.60694
Early stopping, best iteration is:
[377]        valid_0's rmse: 1.60672
1.6285849483981747
totals_newVisits   59
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61575
[200]        valid_0's rmse: 1.6098
[300]        valid_0's rmse: 1.60745
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60733
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1.629071448053123
totals_newVisits   60
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61592
[200]        valid_0's rmse: 1.60874
[300]        valid_0's rmse: 1.60847
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.60825
1.6302741215472245
totals_newVisits   61
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61596
[200]        valid_0's rmse: 1.60786
[300]        valid_0's rmse: 1.60618
[400]        valid_0's rmse: 1.60606
Early stopping, best iteration is:
[328]        valid_0's rmse: 1.60572
1.6284130223663709
totals_newVisits   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61493
[200]        valid_0's rmse: 1.60808
[300]        valid_0's rmse: 1.60574
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60563
1.628183188209762
totals_newVisits   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61476
[200]        valid_0's rmse: 1.6077
[300]        valid_0's rmse: 1.60524
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60513
1.6278098114205417
totals_newVisits   64
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61471
[200]        valid_0's rmse: 1.60781
[300]        valid_0's rmse: 1.60622
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60619
1.629101824033085
totals_newVisits   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61443
[200]        valid_0's rmse: 1.60746
[300]        valid_0's rmse: 1.60627
Early stopping, best iteration is:
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[285]	valid_0's rmse: 1.60617
1.6279956511021636
totals_newVisits   66
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61533
[200]	valid_0's rmse: 1.60796
[300]	valid_0's rmse: 1.60712
[400]	valid_0's rmse: 1.60695
Early stopping, best iteration is:
[371]	valid_0's rmse: 1.6066
1.6282488369519972
totals_newVisits   67
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61482
[200]	valid_0's rmse: 1.60741
[300]	valid_0's rmse: 1.60602
[400]	valid_0's rmse: 1.60601
Early stopping, best iteration is:
[368]	valid_0's rmse: 1.60517
1.627687970370403
totals_newVisits   68
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61399
[200]	valid_0's rmse: 1.60744
[300]	valid_0's rmse: 1.60612
[400]	valid_0's rmse: 1.60701
Early stopping, best iteration is:
[315]	valid_0's rmse: 1.60584
1.6284677872632427
totals_newVisits   69
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61445
[200]	valid_0's rmse: 1.60868
[300]	valid_0's rmse: 1.60657
[400]	valid_0's rmse: 1.60672
Early stopping, best iteration is:
[388]	valid_0's rmse: 1.60624
1.6280543733332375
totals_newVisits   70
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61479
[200]	valid_0's rmse: 1.60718
[300]	valid_0's rmse: 1.607
Early stopping, best iteration is:
[249]	valid_0's rmse: 1.60644
1.6290838842387574
totals_newVisits   71
Training until validation scores don't improve for 100 rounds.
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[100]	valid_0's rmse: 1.61492
[200]	valid_0's rmse: 1.60624
[300]	valid_0's rmse: 1.60521
[400]	valid_0's rmse: 1.60591
Early stopping, best iteration is:
[306]	valid_0's rmse: 1.60516
1.6272913459620197
totals_newVisits   72
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61547
[200]	valid_0's rmse: 1.60757
[300]	valid_0's rmse: 1.60555
[400]	valid_0's rmse: 1.60617
Early stopping, best iteration is:
[321]	valid_0's rmse: 1.60534
1.6269745954086097
totals_newVisits   73
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61498
[200]	valid_0's rmse: 1.60727
[300]	valid_0's rmse: 1.60565
[400]	valid_0's rmse: 1.60691
Early stopping, best iteration is:
[300]	valid_0's rmse: 1.60565
1.627380144920987
totals_newVisits   74
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61294
[200]	valid_0's rmse: 1.60692
[300]	valid_0's rmse: 1.60517
Early stopping, best iteration is:
[295]	valid_0's rmse: 1.60502
1.6274705173244992
totals_newVisits   75
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61378
[200]	valid_0's rmse: 1.60581
[300]	valid_0's rmse: 1.60483
[400]	valid_0's rmse: 1.60584
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.6046
1.62661575027649
totals_newVisits   76
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61498
[200]	valid_0's rmse: 1.60827
[300]	valid_0's rmse: 1.60685
Early stopping, best iteration is:
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[297]	valid_0's rmse: 1.60673
1.6289527110713558
totals_newVisits   77
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61431
[200]	valid_0's rmse: 1.60667
[300]	valid_0's rmse: 1.60556
[400]	valid_0's rmse: 1.60567
Early stopping, best iteration is:
[371]	valid_0's rmse: 1.60519
1.6274934264480547
totals_newVisits   78
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61413
[200]	valid_0's rmse: 1.60679
[300]	valid_0's rmse: 1.60664
[400]	valid_0's rmse: 1.60778
Early stopping, best iteration is:
[322]	valid_0's rmse: 1.60616
1.6275777419231476
totals_newVisits   79
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61531
[200]	valid_0's rmse: 1.60895
[300]	valid_0's rmse: 1.60757
[400]	valid_0's rmse: 1.60761
Early stopping, best iteration is:
[389]	valid_0's rmse: 1.60715
1.6281380798938194
totals_newVisits   80
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6145
[200]	valid_0's rmse: 1.607
[300]	valid_0's rmse: 1.60689
[400]	valid_0's rmse: 1.60766
Early stopping, best iteration is:
[333]	valid_0's rmse: 1.60653
1.6289679745294454
totals_newVisits   81
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61516
[200]	valid_0's rmse: 1.60839
[300]	valid_0's rmse: 1.60729
[400]	valid_0's rmse: 1.60884
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60713
1.6284323335209456
totals_newVisits   82
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61477
[200]        valid_0's rmse: 1.6069
[300]        valid_0's rmse: 1.60604
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.60553
1.6270349224988376
totals_newVisits   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61501
[200]        valid_0's rmse: 1.60692
[300]        valid_0's rmse: 1.60575
[400]        valid_0's rmse: 1.60743
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60561
1.628413199444522
totals_newVisits   84
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61455
[200]        valid_0's rmse: 1.609
[300]        valid_0's rmse: 1.60534
[400]        valid_0's rmse: 1.60696
Early stopping, best iteration is:
[317]        valid_0's rmse: 1.60495
1.6277114448520473
totals_newVisits   85
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61467
[200]        valid_0's rmse: 1.60855
[300]        valid_0's rmse: 1.60689
[400]        valid_0's rmse: 1.60624
[500]        valid_0's rmse: 1.60891
Early stopping, best iteration is:
[410]        valid_0's rmse: 1.60618
1.627611957572389
totals_newVisits   86
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61488
[200]        valid_0's rmse: 1.6073
[300]        valid_0's rmse: 1.60513
Early stopping, best iteration is:
[298]        valid_0's rmse: 1.60511
1.6272716762822643
totals_newVisits   87
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61373
[200]        valid_0's rmse: 1.60735
[300]        valid_0's rmse: 1.60607
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Early stopping, best iteration is:
[291]	valid_0's rmse: 1.60592
1.6278972732921246
totals_newVisits   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61524
[200]	valid_0's rmse: 1.60764
[300]	valid_0's rmse: 1.60582
[400]	valid_0's rmse: 1.60459
Early stopping, best iteration is:
[389]	valid_0's rmse: 1.60442
1.626969497235188
totals_newVisits   89
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61399
[200]	valid_0's rmse: 1.60771
[300]	valid_0's rmse: 1.60589
[400]	valid_0's rmse: 1.60662
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60583
1.6282201812021273
totals_newVisits   90
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61474
[200]	valid_0's rmse: 1.60644
[300]	valid_0's rmse: 1.60639
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60611
1.6282417177857893
totals_newVisits   91
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61461
[200]	valid_0's rmse: 1.60712
[300]	valid_0's rmse: 1.60551
Early stopping, best iteration is:
[299]	valid_0's rmse: 1.60549
1.6279344546560666
totals_newVisits   92
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61377
[200]	valid_0's rmse: 1.60703
[300]	valid_0's rmse: 1.6054
Early stopping, best iteration is:
[294]	valid_0's rmse: 1.60517
1.6276108767857316
totals_newVisits   93
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61501
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[200]	valid_0's rmse: 1.60776
[300]	valid_0's rmse: 1.60586
[400]	valid_0's rmse: 1.60609
Early stopping, best iteration is:
[378]	valid_0's rmse: 1.60563
1.6272708652520782
totals_newVisits   94
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6139
[200]	valid_0's rmse: 1.60835
[300]	valid_0's rmse: 1.60662
[400]	valid_0's rmse: 1.6062
Early stopping, best iteration is:
[370]	valid_0's rmse: 1.60586
1.6274406874261331
totals_newVisits   95
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61381
[200]	valid_0's rmse: 1.60669
[300]	valid_0's rmse: 1.60536
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60516
1.6275801011245814
totals_newVisits   96
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61438
[200]	valid_0's rmse: 1.60857
[300]	valid_0's rmse: 1.60727
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.6072
1.6291823696042609
totals_newVisits   97
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61463
[200]	valid_0's rmse: 1.6093
[300]	valid_0's rmse: 1.6085
Early stopping, best iteration is:
[240]	valid_0's rmse: 1.60841
1.6313189072346792
totals_newVisits   98
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61456
[200]	valid_0's rmse: 1.60675
[300]	valid_0's rmse: 1.60708
Early stopping, best iteration is:
[226]	valid_0's rmse: 1.60601
1.6282304011653423
totals_newVisits   99
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61488
[200]        valid_0's rmse: 1.60703
[300]        valid_0's rmse: 1.60712
Early stopping, best iteration is:
[255]        valid_0's rmse: 1.60677
1.629630721419308
geoNetwork_continent   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.60934
[300]        valid_0's rmse: 1.60846
Early stopping, best iteration is:
[288]        valid_0's rmse: 1.60796
1.6295654133362625
geoNetwork_continent   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61672
[200]        valid_0's rmse: 1.60948
[300]        valid_0's rmse: 1.60937
Early stopping, best iteration is:
[288]        valid_0's rmse: 1.60921
1.6308633918902784
geoNetwork_continent   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61518
[200]        valid_0's rmse: 1.6092
[300]        valid_0's rmse: 1.60734
[400]        valid_0's rmse: 1.60757
Early stopping, best iteration is:
[339]        valid_0's rmse: 1.60702
1.6287032844982348
geoNetwork_continent   3
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61414
[200]        valid_0's rmse: 1.60771
[300]        valid_0's rmse: 1.60654
Early stopping, best iteration is:
[292]        valid_0's rmse: 1.60637
1.6286285097842543
geoNetwork_continent   4
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61672
[200]        valid_0's rmse: 1.60868
[300]        valid_0's rmse: 1.60713
[400]        valid_0's rmse: 1.60847
Early stopping, best iteration is:
[334]        valid_0's rmse: 1.60708
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1.6279388162888302
geoNetwork_continent   5
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61638
[200]        valid_0's rmse: 1.60954
[300]        valid_0's rmse: 1.60713
Early stopping, best iteration is:
[296]        valid_0's rmse: 1.60698
1.6282537723603832
geoNetwork_continent   6
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6159
[200]        valid_0's rmse: 1.60825
[300]        valid_0's rmse: 1.60598
Early stopping, best iteration is:
[295]        valid_0's rmse: 1.60576
1.6274247275380447
geoNetwork_continent   7
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61606
[200]        valid_0's rmse: 1.60946
[300]        valid_0's rmse: 1.60697
[400]        valid_0's rmse: 1.60858
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.60696
1.6285100416508975
geoNetwork_continent   8
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61672
[200]        valid_0's rmse: 1.60965
[300]        valid_0's rmse: 1.60827
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.60789
1.6292690742665998
geoNetwork_continent   9
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61528
[200]        valid_0's rmse: 1.60805
[300]        valid_0's rmse: 1.60657
[400]        valid_0's rmse: 1.60743
Early stopping, best iteration is:
[321]        valid_0's rmse: 1.60632
1.6276895777949123
geoNetwork_continent   10
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61558
[200]        valid_0's rmse: 1.60878
[300]        valid_0's rmse: 1.60842
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Early stopping, best iteration is:
[264]	valid_0's rmse: 1.60812
1.6300356376517096
geoNetwork_continent   11
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61555
[200]	valid_0's rmse: 1.60815
[300]	valid_0's rmse: 1.60664
[400]	valid_0's rmse: 1.60648
Early stopping, best iteration is:
[370]	valid_0's rmse: 1.60609
1.6274293000797297
geoNetwork_continent   12
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61546
[200]	valid_0's rmse: 1.6088
[300]	valid_0's rmse: 1.60712
Early stopping, best iteration is:
[298]	valid_0's rmse: 1.60709
1.6290887800623004
geoNetwork_continent   13
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61712
[200]	valid_0's rmse: 1.60935
[300]	valid_0's rmse: 1.60867
Early stopping, best iteration is:
[267]	valid_0's rmse: 1.60843
1.6298403103164696
geoNetwork_continent   14
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61636
[200]	valid_0's rmse: 1.60851
[300]	valid_0's rmse: 1.60707
[400]	valid_0's rmse: 1.60854
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60701
1.6287719469085655
geoNetwork_continent   15
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6157
[200]	valid_0's rmse: 1.60745
[300]	valid_0's rmse: 1.60728
Early stopping, best iteration is:
[285]	valid_0's rmse: 1.607
1.6288590228428401
geoNetwork_continent   16
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61525
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[200]	valid_0's rmse: 1.60862
[300]	valid_0's rmse: 1.60704
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60695
1.62834628453936
geoNetwork_continent   17
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61636
[200]	valid_0's rmse: 1.60965
[300]	valid_0's rmse: 1.60748
[400]	valid_0's rmse: 1.60852
Early stopping, best iteration is:
[320]	valid_0's rmse: 1.60699
1.6283713459784788
geoNetwork_continent   18
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61579
[200]	valid_0's rmse: 1.61034
[300]	valid_0's rmse: 1.60914
[400]	valid_0's rmse: 1.60929
Early stopping, best iteration is:
[371]	valid_0's rmse: 1.60844
1.6294619758816888
geoNetwork_continent   19
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61577
[200]	valid_0's rmse: 1.60956
[300]	valid_0's rmse: 1.6082
Early stopping, best iteration is:
[246]	valid_0's rmse: 1.60782
1.6305832837859455
geoNetwork_continent   20
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61584
[200]	valid_0's rmse: 1.60809
[300]	valid_0's rmse: 1.60697
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60681
1.6279382759650158
geoNetwork_continent   21
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61521
[200]	valid_0's rmse: 1.60885
[300]	valid_0's rmse: 1.60791
Early stopping, best iteration is:
[264]	valid_0's rmse: 1.6069
1.6284213514526618
geoNetwork_continent   22
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61615
[200]        valid_0's rmse: 1.61015
[300]        valid_0's rmse: 1.60748
[400]        valid_0's rmse: 1.60801
Early stopping, best iteration is:
[326]        valid_0's rmse: 1.60691
1.6286370427002068
geoNetwork_continent   23
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61676
[200]        valid_0's rmse: 1.60999
[300]        valid_0's rmse: 1.60851
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.60834
1.6298429530565288
geoNetwork_continent   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61644
[200]        valid_0's rmse: 1.6083
[300]        valid_0's rmse: 1.60748
[400]        valid_0's rmse: 1.608
Early stopping, best iteration is:
[323]        valid_0's rmse: 1.60718
1.628224201477644
geoNetwork_continent   25
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61572
[200]        valid_0's rmse: 1.60969
[300]        valid_0's rmse: 1.60799
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60786
1.629634499301745
geoNetwork_continent   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61591
[200]        valid_0's rmse: 1.60797
[300]        valid_0's rmse: 1.60628
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60623
1.6279492181843391
geoNetwork_continent   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61515
[200]        valid_0's rmse: 1.60812
[300]        valid_0's rmse: 1.60711
Early stopping, best iteration is:
[267]        valid_0's rmse: 1.60694
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1.6281534526322199
geoNetwork_continent   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61645
[200]        valid_0's rmse: 1.60927
[300]        valid_0's rmse: 1.60797
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.60776
1.6294508604069005
geoNetwork_continent   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.615
[200]        valid_0's rmse: 1.60964
[300]        valid_0's rmse: 1.60868
[400]        valid_0's rmse: 1.60826
Early stopping, best iteration is:
[340]        valid_0's rmse: 1.60783
1.6292837108356588
geoNetwork_continent   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6159
[200]        valid_0's rmse: 1.60952
[300]        valid_0's rmse: 1.60839
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.60796
1.6296139839196366
geoNetwork_continent   31
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61584
[200]        valid_0's rmse: 1.60919
[300]        valid_0's rmse: 1.60789
Early stopping, best iteration is:
[287]        valid_0's rmse: 1.60761
1.6294260175514312
geoNetwork_continent   32
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61508
[200]        valid_0's rmse: 1.60803
[300]        valid_0's rmse: 1.60792
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.60738
1.6286408895113156
geoNetwork_continent   33
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61566
[200]        valid_0's rmse: 1.60823
[300]        valid_0's rmse: 1.60701
[400]        valid_0's rmse: 1.60799
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Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60682
1.628856782064501
geoNetwork_continent   34
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61512
[200]	valid_0's rmse: 1.60745
[300]	valid_0's rmse: 1.60644
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60641
1.6275763539620405
geoNetwork_continent   35
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6158
[200]	valid_0's rmse: 1.60847
[300]	valid_0's rmse: 1.60692
[400]	valid_0's rmse: 1.60761
Early stopping, best iteration is:
[325]	valid_0's rmse: 1.60669
1.6287651286873543
geoNetwork_continent   36
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6156
[200]	valid_0's rmse: 1.60955
[300]	valid_0's rmse: 1.60725
Early stopping, best iteration is:
[288]	valid_0's rmse: 1.60721
1.6289259189572964
geoNetwork_continent   37
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61609
[200]	valid_0's rmse: 1.60869
[300]	valid_0's rmse: 1.60635
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.60611
1.6276469620284006
geoNetwork_continent   38
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61593
[200]	valid_0's rmse: 1.60757
[300]	valid_0's rmse: 1.60703
Early stopping, best iteration is:
[267]	valid_0's rmse: 1.60664
1.6282979553563515
geoNetwork_continent   39
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61583
[200]	valid_0's rmse: 1.60891
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[300]	valid_0's rmse: 1.60722
Early stopping, best iteration is:
[289]	valid_0's rmse: 1.60714
1.6288968198824234
geoNetwork_continent   40
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61604
[200]	valid_0's rmse: 1.60972
[300]	valid_0's rmse: 1.60879
Early stopping, best iteration is:
[288]	valid_0's rmse: 1.60862
1.6305792405704271
geoNetwork_continent   41
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61574
[200]	valid_0's rmse: 1.60917
[300]	valid_0's rmse: 1.60699
Early stopping, best iteration is:
[289]	valid_0's rmse: 1.60689
1.6279700580314496
geoNetwork_continent   42
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61591
[200]	valid_0's rmse: 1.60937
[300]	valid_0's rmse: 1.60721
Early stopping, best iteration is:
[293]	valid_0's rmse: 1.60682
1.6278392492302443
geoNetwork_continent   43
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61481
[200]	valid_0's rmse: 1.60812
[300]	valid_0's rmse: 1.60834
Early stopping, best iteration is:
[205]	valid_0's rmse: 1.60758
1.6290913141708916
geoNetwork_continent   44
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61499
[200]	valid_0's rmse: 1.60842
[300]	valid_0's rmse: 1.60629
[400]	valid_0's rmse: 1.60797
Early stopping, best iteration is:
[307]	valid_0's rmse: 1.60617
1.6275997990476678
geoNetwork_continent   45
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61604
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[200]	valid_0's rmse: 1.60879
[300]	valid_0's rmse: 1.60596
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.60589
1.627581131451362
geoNetwork_continent   46
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.6161
[200]	valid_0's rmse: 1.60967
[300]	valid_0's rmse: 1.60857
Early stopping, best iteration is:
[289]	valid_0's rmse: 1.60818
1.6290085179252192
geoNetwork_continent   47
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61529
[200]	valid_0's rmse: 1.6087
[300]	valid_0's rmse: 1.60804
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60781
1.6292247507237816
geoNetwork_continent   48
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61639
[200]	valid_0's rmse: 1.60959
[300]	valid_0's rmse: 1.60897
[400]	valid_0's rmse: 1.60963
Early stopping, best iteration is:
[304]	valid_0's rmse: 1.60874
1.6300652724694003
geoNetwork_continent   49
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61608
[200]	valid_0's rmse: 1.61003
[300]	valid_0's rmse: 1.60777
[400]	valid_0's rmse: 1.60916
Early stopping, best iteration is:
[318]	valid_0's rmse: 1.60759
1.6286859365135966
geoNetwork_continent   50
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61479
[200]	valid_0's rmse: 1.60815
[300]	valid_0's rmse: 1.60612
[400]	valid_0's rmse: 1.60762
Early stopping, best iteration is:
[325]	valid_0's rmse: 1.60569
1.6275167849089007
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geoNetwork_continent   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61544
[200]        valid_0's rmse: 1.60816
[300]        valid_0's rmse: 1.60753
Early stopping, best iteration is:
[257]        valid_0's rmse: 1.60718
1.6286249439802267
geoNetwork_continent   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61505
[200]        valid_0's rmse: 1.61014
[300]        valid_0's rmse: 1.60842
Early stopping, best iteration is:
[299]        valid_0's rmse: 1.6084
1.6297440002903223
geoNetwork_continent   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6159
[200]        valid_0's rmse: 1.60859
[300]        valid_0's rmse: 1.60695
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60674
1.6282297232079548
geoNetwork_continent   54
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61562
[200]        valid_0's rmse: 1.60884
[300]        valid_0's rmse: 1.60625
[400]        valid_0's rmse: 1.60803
Early stopping, best iteration is:
[300]        valid_0's rmse: 1.60625
1.6283410535611043
geoNetwork_continent   55
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61543
[200]        valid_0's rmse: 1.60772
[300]        valid_0's rmse: 1.60544
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.6053
1.6268409306783647
geoNetwork_continent   56
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61651
[200]        valid_0's rmse: 1.61078
[300]        valid_0's rmse: 1.60895
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60893
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1.6299641153479885
geoNetwork_continent   57
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61649
[200]        valid_0's rmse: 1.61142
[300]        valid_0's rmse: 1.61123
Early stopping, best iteration is:
[258]        valid_0's rmse: 1.61055
1.6319628868966722
geoNetwork_continent   58
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61547
[200]        valid_0's rmse: 1.60891
[300]        valid_0's rmse: 1.6077
Early stopping, best iteration is:
[266]        valid_0's rmse: 1.60752
1.6295777763532606
geoNetwork_continent   59
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61576
[200]        valid_0's rmse: 1.60786
[300]        valid_0's rmse: 1.60755
Early stopping, best iteration is:
[257]        valid_0's rmse: 1.607
1.6294338894187448
geoNetwork_continent   60
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61558
[200]        valid_0's rmse: 1.60962
[300]        valid_0's rmse: 1.6087
Early stopping, best iteration is:
[284]        valid_0's rmse: 1.60846
1.6307208948827623
geoNetwork_continent   61
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61535
[200]        valid_0's rmse: 1.60918
[300]        valid_0's rmse: 1.60799
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.60741
1.6287203026625645
geoNetwork_continent   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61469
[200]        valid_0's rmse: 1.60791
[300]        valid_0's rmse: 1.60577
[400]        valid_0's rmse: 1.60699
Early stopping, best iteration is:
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[319]        valid_0's rmse: 1.60538
1.6263923070179864
geoNetwork_continent   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61437
[200]        valid_0's rmse: 1.6086
[300]        valid_0's rmse: 1.6067
[400]        valid_0's rmse: 1.60849
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.60668
1.6286547881595246
geoNetwork_continent   64
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61509
[200]        valid_0's rmse: 1.60827
[300]        valid_0's rmse: 1.60678
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.6067
1.6293520588265515
geoNetwork_continent   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61648
[200]        valid_0's rmse: 1.60943
[300]        valid_0's rmse: 1.60762
[400]        valid_0's rmse: 1.60856
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60748
1.6293290915115244
geoNetwork_continent   66
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61634
[200]        valid_0's rmse: 1.60908
[300]        valid_0's rmse: 1.60851
[400]        valid_0's rmse: 1.60977
Early stopping, best iteration is:
[309]        valid_0's rmse: 1.60829
1.629574715409025
geoNetwork_continent   67
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61727
[200]        valid_0's rmse: 1.61047
[300]        valid_0's rmse: 1.61049
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.60961
1.6314566432190412
geoNetwork_continent   68
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61612
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[200]	valid_0's rmse: 1.61001
[300]	valid_0's rmse: 1.60759
[400]	valid_0's rmse: 1.60916
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60737
1.629165509272356
geoNetwork_continent   69
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61631
[200]	valid_0's rmse: 1.60794
[300]	valid_0's rmse: 1.60576
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60567
1.6282034915715868
geoNetwork_continent   70
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61557
[200]	valid_0's rmse: 1.60739
[300]	valid_0's rmse: 1.60668
Early stopping, best iteration is:
[263]	valid_0's rmse: 1.6062
1.6275627459610646
geoNetwork_continent   71
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61624
[200]	valid_0's rmse: 1.60794
[300]	valid_0's rmse: 1.6068
Early stopping, best iteration is:
[259]	valid_0's rmse: 1.60663
1.6281600474082594
geoNetwork_continent   72
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61735
[200]	valid_0's rmse: 1.6103
[300]	valid_0's rmse: 1.60812
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.6081
1.6298263393204817
geoNetwork_continent   73
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61546
[200]	valid_0's rmse: 1.60931
[300]	valid_0's rmse: 1.60795
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.60787
1.6289446904120615
geoNetwork_continent   74
Training until validation scores don't improve for 100 rounds.
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[100]	valid_0's rmse: 1.61609
[200]	valid_0's rmse: 1.61064
[300]	valid_0's rmse: 1.60905
[400]	valid_0's rmse: 1.60963
Early stopping, best iteration is:
[334]	valid_0's rmse: 1.60883
1.6300985984329361
geoNetwork_continent   75
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61582
[200]	valid_0's rmse: 1.60717
[300]	valid_0's rmse: 1.6062
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.6061
1.6277413073393714
geoNetwork_continent   76
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61488
[200]	valid_0's rmse: 1.60934
[300]	valid_0's rmse: 1.6091
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60881
1.6303868222357092
geoNetwork_continent   77
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61469
[200]	valid_0's rmse: 1.60854
[300]	valid_0's rmse: 1.60785
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60781
1.6292727881731077
geoNetwork_continent   78
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61586
[200]	valid_0's rmse: 1.60885
[300]	valid_0's rmse: 1.60753
Early stopping, best iteration is:
[290]	valid_0's rmse: 1.60704
1.6288518575443285
geoNetwork_continent   79
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61724
[200]	valid_0's rmse: 1.61008
[300]	valid_0's rmse: 1.60939
Early stopping, best iteration is:
[264]	valid_0's rmse: 1.60916
1.6304845192050483
geoNetwork_continent   80
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61533
[200]        valid_0's rmse: 1.60829
[300]        valid_0's rmse: 1.60547
[400]        valid_0's rmse: 1.60636
Early stopping, best iteration is:
[363]        valid_0's rmse: 1.60536
1.626582325080128
geoNetwork_continent   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61613
[200]        valid_0's rmse: 1.60883
[300]        valid_0's rmse: 1.60723
[400]        valid_0's rmse: 1.60943
Early stopping, best iteration is:
[306]        valid_0's rmse: 1.60715
1.6288844859292024
geoNetwork_continent   82
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61386
[200]        valid_0's rmse: 1.60721
[300]        valid_0's rmse: 1.60672
Early stopping, best iteration is:
[282]        valid_0's rmse: 1.60622
1.628120266118874
geoNetwork_continent   83
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61532
[200]        valid_0's rmse: 1.60918
[300]        valid_0's rmse: 1.60854
Early stopping, best iteration is:
[267]        valid_0's rmse: 1.60777
1.6292663619478047
geoNetwork_continent   84
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61646
[200]        valid_0's rmse: 1.60901
[300]        valid_0's rmse: 1.608
[400]        valid_0's rmse: 1.60939
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.60744
1.6278290927850734
geoNetwork_continent   85
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61454
[200]        valid_0's rmse: 1.60798
[300]        valid_0's rmse: 1.60591
Early stopping, best iteration is:
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[287]        valid_0's rmse: 1.60579
1.627804916019608
geoNetwork_continent   86
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61431
[200]        valid_0's rmse: 1.60793
[300]        valid_0's rmse: 1.60729
[400]        valid_0's rmse: 1.60853
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60701
1.6286442458311046
geoNetwork_continent   87
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6159
[200]        valid_0's rmse: 1.60948
[300]        valid_0's rmse: 1.60882
Early stopping, best iteration is:
[283]        valid_0's rmse: 1.60856
1.6306429043977642
geoNetwork_continent   88
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61561
[200]        valid_0's rmse: 1.60812
[300]        valid_0's rmse: 1.60636
[400]        valid_0's rmse: 1.60757
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.6063
1.627517381597849
geoNetwork_continent   89
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61485
[200]        valid_0's rmse: 1.60756
[300]        valid_0's rmse: 1.60649
Early stopping, best iteration is:
[272]        valid_0's rmse: 1.60585
1.6286656935100539
geoNetwork_continent   90
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61602
[200]        valid_0's rmse: 1.60986
[300]        valid_0's rmse: 1.60933
Early stopping, best iteration is:
[240]        valid_0's rmse: 1.60888
1.6303364132989604
geoNetwork_continent   91
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61577
[200]        valid_0's rmse: 1.61001
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[300]	valid_0's rmse: 1.60881
[400]	valid_0's rmse: 1.60955
Early stopping, best iteration is:
[339]	valid_0's rmse: 1.60837
1.6303257525920016
geoNetwork_continent   92
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61545
[200]	valid_0's rmse: 1.6092
[300]	valid_0's rmse: 1.60738
Early stopping, best iteration is:
[287]	valid_0's rmse: 1.6073
1.6294312871125893
geoNetwork_continent   93
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61528
[200]	valid_0's rmse: 1.60902
[300]	valid_0's rmse: 1.6076
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.6073
1.6292581904434367
geoNetwork_continent   94
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61608
[200]	valid_0's rmse: 1.60843
[300]	valid_0's rmse: 1.60688
[400]	valid_0's rmse: 1.60666
Early stopping, best iteration is:
[388]	valid_0's rmse: 1.60619
1.6278269114712562
geoNetwork_continent   95
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61641
[200]	valid_0's rmse: 1.60864
[300]	valid_0's rmse: 1.60823
[400]	valid_0's rmse: 1.60993
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60812
1.6290136630376288
geoNetwork_continent   96
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61581
[200]	valid_0's rmse: 1.60839
[300]	valid_0's rmse: 1.6065
[400]	valid_0's rmse: 1.60733
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60632
1.628185421490788
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geoNetwork_continent   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61685
[200]        valid_0's rmse: 1.61024
[300]        valid_0's rmse: 1.60745
[400]        valid_0's rmse: 1.60769
Early stopping, best iteration is:
[332]        valid_0's rmse: 1.60699
1.6288478144328873
geoNetwork_continent   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61573
[200]        valid_0's rmse: 1.6079
[300]        valid_0's rmse: 1.60731
Early stopping, best iteration is:
[240]        valid_0's rmse: 1.60715
1.6295548374134259
geoNetwork_continent   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60888
[300]        valid_0's rmse: 1.60752
[400]        valid_0's rmse: 1.60864
Early stopping, best iteration is:
[323]        valid_0's rmse: 1.60743
1.6289493223000964
trafficSource_adwordsClickInfo.isVideoAd   0
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61579
[200]        valid_0's rmse: 1.60832
[300]        valid_0's rmse: 1.60709
[400]        valid_0's rmse: 1.60802
Early stopping, best iteration is:
[314]        valid_0's rmse: 1.60667
1.627625081330889
trafficSource_adwordsClickInfo.isVideoAd   1
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6156
[200]        valid_0's rmse: 1.60857
[300]        valid_0's rmse: 1.60671
[400]        valid_0's rmse: 1.60608
Early stopping, best iteration is:
[341]        valid_0's rmse: 1.60578
1.6279599643479297
trafficSource_adwordsClickInfo.isVideoAd   2
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61548
[200]        valid_0's rmse: 1.60767
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[300]	valid_0's rmse: 1.6062
Early stopping, best iteration is:
[273]	valid_0's rmse: 1.60603
1.6276853954518116
trafficSource_adwordsClickInfo.isVideoAd   3
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61556
[200]	valid_0's rmse: 1.60872
[300]	valid_0's rmse: 1.60683
[400]	valid_0's rmse: 1.60787
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60672
1.6281478781296947
trafficSource_adwordsClickInfo.isVideoAd   4
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61453
[200]	valid_0's rmse: 1.60786
[300]	valid_0's rmse: 1.60675
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60671
1.628103659534005
trafficSource_adwordsClickInfo.isVideoAd   5
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61486
[200]	valid_0's rmse: 1.60856
[300]	valid_0's rmse: 1.60662
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60648
1.6287457736877775
trafficSource_adwordsClickInfo.isVideoAd   6
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61469
[200]	valid_0's rmse: 1.60796
[300]	valid_0's rmse: 1.6053
[400]	valid_0's rmse: 1.60724
Early stopping, best iteration is:
[316]	valid_0's rmse: 1.60485
1.627200623269411
trafficSource_adwordsClickInfo.isVideoAd   7
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61595
[200]	valid_0's rmse: 1.60813
[300]	valid_0's rmse: 1.60594
Early stopping, best iteration is:
[282]	valid_0's rmse: 1.60577
1.6272761633885604
trafficSource_adwordsClickInfo.isVideoAd   8
Training until validation scores don't improve for 100 rounds.
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[100]	valid_0's rmse: 1.61581
[200]	valid_0's rmse: 1.60902
[300]	valid_0's rmse: 1.60691
[400]	valid_0's rmse: 1.60814
Early stopping, best iteration is:
[302]	valid_0's rmse: 1.60683
1.6288541805945185
trafficSource_adwordsClickInfo.isVideoAd   9
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61429
[200]	valid_0's rmse: 1.60714
[300]	valid_0's rmse: 1.60623
[400]	valid_0's rmse: 1.60739
Early stopping, best iteration is:
[321]	valid_0's rmse: 1.60597
1.6275939554272731
trafficSource_adwordsClickInfo.isVideoAd   10
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61406
[200]	valid_0's rmse: 1.60733
[300]	valid_0's rmse: 1.60675
Early stopping, best iteration is:
[273]	valid_0's rmse: 1.60634
1.6286519668155899
trafficSource_adwordsClickInfo.isVideoAd   11
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61499
[200]	valid_0's rmse: 1.60782
[300]	valid_0's rmse: 1.60627
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60609
1.6280503010670948
trafficSource_adwordsClickInfo.isVideoAd   12
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61391
[200]	valid_0's rmse: 1.60719
[300]	valid_0's rmse: 1.60539
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.60524
1.6263640168451345
trafficSource_adwordsClickInfo.isVideoAd   13
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61505
[200]	valid_0's rmse: 1.60734
[300]	valid_0's rmse: 1.60674
Early stopping, best iteration is:
[291]	valid_0's rmse: 1.60645
1.628081630809526
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trafficSource_adwordsClickInfo.isVideoAd   14
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61628
[200]        valid_0's rmse: 1.60936
[300]        valid_0's rmse: 1.60723
[400]        valid_0's rmse: 1.60812
Early stopping, best iteration is:
[312]        valid_0's rmse: 1.60704
1.628562169485312
trafficSource_adwordsClickInfo.isVideoAd   15
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61365
[200]        valid_0's rmse: 1.60635
[300]        valid_0's rmse: 1.60516
Early stopping, best iteration is:
[264]        valid_0's rmse: 1.60498
1.6269203690476461
trafficSource_adwordsClickInfo.isVideoAd   16
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.6082
[300]        valid_0's rmse: 1.60634
Early stopping, best iteration is:
[289]        valid_0's rmse: 1.60617
1.62782331370879
trafficSource_adwordsClickInfo.isVideoAd   17
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61538
[200]        valid_0's rmse: 1.60704
[300]        valid_0's rmse: 1.60558
Early stopping, best iteration is:
[287]        valid_0's rmse: 1.60509
1.6273814931992372
trafficSource_adwordsClickInfo.isVideoAd   18
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61559
[200]        valid_0's rmse: 1.60783
[300]        valid_0's rmse: 1.60602
[400]        valid_0's rmse: 1.60903
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60587
1.6274140014924503
trafficSource_adwordsClickInfo.isVideoAd   19
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61449
[200]        valid_0's rmse: 1.60666
[300]        valid_0's rmse: 1.60526
[400]        valid_0's rmse: 1.60644
```

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Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60511
1.6268735643743517
trafficSource_adwordsClickInfo.isVideoAd   20
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61584
[200]        valid_0's rmse: 1.60846
[300]        valid_0's rmse: 1.60597
[400]        valid_0's rmse: 1.60698
Early stopping, best iteration is:
[315]        valid_0's rmse: 1.60549
1.6270510184262108
trafficSource_adwordsClickInfo.isVideoAd   21
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60786
[300]        valid_0's rmse: 1.60587
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.60568
1.6270657163974978
trafficSource_adwordsClickInfo.isVideoAd   22
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61502
[200]        valid_0's rmse: 1.60788
[300]        valid_0's rmse: 1.6056
[400]        valid_0's rmse: 1.60671
Early stopping, best iteration is:
[302]        valid_0's rmse: 1.60553
1.628074212410166
trafficSource_adwordsClickInfo.isVideoAd   23
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61586
[200]        valid_0's rmse: 1.60833
[300]        valid_0's rmse: 1.60685
[400]        valid_0's rmse: 1.60732
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.60663
1.6286484368413172
trafficSource_adwordsClickInfo.isVideoAd   24
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61533
[200]        valid_0's rmse: 1.60892
[300]        valid_0's rmse: 1.60701
Early stopping, best iteration is:
[286]        valid_0's rmse: 1.60675
1.6287126023351775
trafficSource_adwordsClickInfo.isVideoAd   25
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.61525
[200]        valid_0's rmse: 1.60873
[300]        valid_0's rmse: 1.60778
Early stopping, best iteration is:
[240]        valid_0's rmse: 1.60724
1.6295908896061688
trafficSource_adwordsClickInfo.isVideoAd   26
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61555
[200]        valid_0's rmse: 1.60731
[300]        valid_0's rmse: 1.60418
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.60405
1.6263306101010382
trafficSource_adwordsClickInfo.isVideoAd   27
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61564
[200]        valid_0's rmse: 1.60698
[300]        valid_0's rmse: 1.60502
[400]        valid_0's rmse: 1.60591
Early stopping, best iteration is:
[322]        valid_0's rmse: 1.6049
1.6263703650206174
trafficSource_adwordsClickInfo.isVideoAd   28
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.60926
[300]        valid_0's rmse: 1.6078
Early stopping, best iteration is:
[290]        valid_0's rmse: 1.60749
1.6286280640156279
trafficSource_adwordsClickInfo.isVideoAd   29
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61526
[200]        valid_0's rmse: 1.60733
[300]        valid_0's rmse: 1.60603
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.60575
1.6274849048977242
trafficSource_adwordsClickInfo.isVideoAd   30
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61528
[200]        valid_0's rmse: 1.60906
[300]        valid_0's rmse: 1.60865
Early stopping, best iteration is:
[230]        valid_0's rmse: 1.60809
1.6304563281297717
trafficSource_adwordsClickInfo.isVideoAd   31
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61563
[200]        valid_0's rmse: 1.60915
[300]        valid_0's rmse: 1.60826
[400]        valid_0's rmse: 1.60952
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60818
1.6303523056018387
trafficSource_adwordsClickInfo.isVideoAd   32
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60812
[300]        valid_0's rmse: 1.60735
Early stopping, best iteration is:
[292]        valid_0's rmse: 1.60716
1.6287630725030182
trafficSource_adwordsClickInfo.isVideoAd   33
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61533
[200]        valid_0's rmse: 1.60635
[300]        valid_0's rmse: 1.60603
[400]        valid_0's rmse: 1.60632
Early stopping, best iteration is:
[382]        valid_0's rmse: 1.60582
1.6275511969909888
trafficSource_adwordsClickInfo.isVideoAd   34
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61527
[200]        valid_0's rmse: 1.60805
[300]        valid_0's rmse: 1.606
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60598
1.6272015539083482
trafficSource_adwordsClickInfo.isVideoAd   35
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.60881
[300]        valid_0's rmse: 1.60743
[400]        valid_0's rmse: 1.60814
Early stopping, best iteration is:
[309]        valid_0's rmse: 1.60672
1.6279354973220455
trafficSource_adwordsClickInfo.isVideoAd   36
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61546
[200]        valid_0's rmse: 1.60759
[300]        valid_0's rmse: 1.60573
Early stopping, best iteration is:
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[286]        valid_0's rmse: 1.6056
1.6272645320017378
trafficSource_adwordsClickInfo.isVideoAd   37
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61577
[200]        valid_0's rmse: 1.60797
[300]        valid_0's rmse: 1.60714
[400]        valid_0's rmse: 1.60794
Early stopping, best iteration is:
[336]        valid_0's rmse: 1.60696
1.6273734952853576
trafficSource_adwordsClickInfo.isVideoAd   38
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61532
[200]        valid_0's rmse: 1.60859
[300]        valid_0's rmse: 1.60664
[400]        valid_0's rmse: 1.60715
Early stopping, best iteration is:
[342]        valid_0's rmse: 1.60619
1.6271315205564274
trafficSource_adwordsClickInfo.isVideoAd   39
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61591
[200]        valid_0's rmse: 1.60871
[300]        valid_0's rmse: 1.60717
[400]        valid_0's rmse: 1.60816
Early stopping, best iteration is:
[323]        valid_0's rmse: 1.60703
1.629274607901262
trafficSource_adwordsClickInfo.isVideoAd   40
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60928
[300]        valid_0's rmse: 1.60802
[400]        valid_0's rmse: 1.60936
Early stopping, best iteration is:
[318]        valid_0's rmse: 1.60761
1.6285558489960668
trafficSource_adwordsClickInfo.isVideoAd   41
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60897
[300]        valid_0's rmse: 1.60664
Early stopping, best iteration is:
[287]        valid_0's rmse: 1.60644
1.6280942430777043
trafficSource_adwordsClickInfo.isVideoAd   42
Training until validation scores don't improve for 100 rounds.
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[100]        valid_0's rmse: 1.61574
[200]        valid_0's rmse: 1.60795
[300]        valid_0's rmse: 1.60692
[400]        valid_0's rmse: 1.60747
Early stopping, best iteration is:
[304]        valid_0's rmse: 1.60685
1.6284383434044103
trafficSource_adwordsClickInfo.isVideoAd   43
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6149
[200]        valid_0's rmse: 1.60808
[300]        valid_0's rmse: 1.60591
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60574
1.627703652565981
trafficSource_adwordsClickInfo.isVideoAd   44
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61532
[200]        valid_0's rmse: 1.60874
[300]        valid_0's rmse: 1.60697
[400]        valid_0's rmse: 1.60801
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60686
1.6290075770476158
trafficSource_adwordsClickInfo.isVideoAd   45
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61431
[200]        valid_0's rmse: 1.6062
[300]        valid_0's rmse: 1.60602
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.60555
1.627541099850047
trafficSource_adwordsClickInfo.isVideoAd   46
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.60843
[300]        valid_0's rmse: 1.60671
[400]        valid_0's rmse: 1.60749
Early stopping, best iteration is:
[321]        valid_0's rmse: 1.6061
1.6268989569559835
trafficSource_adwordsClickInfo.isVideoAd   47
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.60765
[300]        valid_0's rmse: 1.60704
Early stopping, best iteration is:
[226]        valid_0's rmse: 1.6068
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1.6294794468655585
trafficSource_adwordsClickInfo.isVideoAd   48
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61528
[200]        valid_0's rmse: 1.60859
[300]        valid_0's rmse: 1.60837
Early stopping, best iteration is:
[228]        valid_0's rmse: 1.60778
1.6298816780315406
trafficSource_adwordsClickInfo.isVideoAd   49
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61451
[200]        valid_0's rmse: 1.60787
[300]        valid_0's rmse: 1.60675
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60654
1.6284007105646747
trafficSource_adwordsClickInfo.isVideoAd   50
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60745
[300]        valid_0's rmse: 1.60647
Early stopping, best iteration is:
[274]        valid_0's rmse: 1.60613
1.627573655275678
trafficSource_adwordsClickInfo.isVideoAd   51
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61488
[200]        valid_0's rmse: 1.60764
[300]        valid_0's rmse: 1.60663
Early stopping, best iteration is:
[285]        valid_0's rmse: 1.60649
1.6283445311223514
trafficSource_adwordsClickInfo.isVideoAd   52
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61686
[200]        valid_0's rmse: 1.6093
[300]        valid_0's rmse: 1.60863
[400]        valid_0's rmse: 1.60819
Early stopping, best iteration is:
[388]        valid_0's rmse: 1.6078
1.6288718156273585
trafficSource_adwordsClickInfo.isVideoAd   53
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61499
[200]        valid_0's rmse: 1.6083
[300]        valid_0's rmse: 1.60631
[400]        valid_0's rmse: 1.60652
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Early stopping, best iteration is:
[340]	valid_0's rmse: 1.60547
1.626858821363521
trafficSource_adwordsClickInfo.isVideoAd   54
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61581
[200]	valid_0's rmse: 1.60813
[300]	valid_0's rmse: 1.60685
[400]	valid_0's rmse: 1.60883
Early stopping, best iteration is:
[314]	valid_0's rmse: 1.60642
1.6282348960181907
trafficSource_adwordsClickInfo.isVideoAd   55
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61547
[200]	valid_0's rmse: 1.60797
[300]	valid_0's rmse: 1.60541
[400]	valid_0's rmse: 1.60632
Early stopping, best iteration is:
[317]	valid_0's rmse: 1.60518
1.626799922497803
trafficSource_adwordsClickInfo.isVideoAd   56
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61581
[200]	valid_0's rmse: 1.6079
[300]	valid_0's rmse: 1.60607
[400]	valid_0's rmse: 1.60693
Early stopping, best iteration is:
[323]	valid_0's rmse: 1.60591
1.6274443926697701
trafficSource_adwordsClickInfo.isVideoAd   57
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61581
[200]	valid_0's rmse: 1.60968
[300]	valid_0's rmse: 1.60717
[400]	valid_0's rmse: 1.60884
Early stopping, best iteration is:
[303]	valid_0's rmse: 1.60714
1.6284116765354653
trafficSource_adwordsClickInfo.isVideoAd   58
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61711
[200]	valid_0's rmse: 1.60932
[300]	valid_0's rmse: 1.60771
Early stopping, best iteration is:
[294]	valid_0's rmse: 1.60755
1.6292470801426755
trafficSource_adwordsClickInfo.isVideoAd   59
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Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60766
[300]        valid_0's rmse: 1.60628
[400]        valid_0's rmse: 1.60722
Early stopping, best iteration is:
[302]        valid_0's rmse: 1.60625
1.6282282648065687
trafficSource_adwordsClickInfo.isVideoAd   60
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61442
[200]        valid_0's rmse: 1.6062
[300]        valid_0's rmse: 1.60482
Early stopping, best iteration is:
[292]        valid_0's rmse: 1.60452
1.6262856454966457
trafficSource_adwordsClickInfo.isVideoAd   61
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61392
[200]        valid_0's rmse: 1.60604
[300]        valid_0's rmse: 1.60485
Early stopping, best iteration is:
[235]        valid_0's rmse: 1.60453
1.626279583316436
trafficSource_adwordsClickInfo.isVideoAd   62
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61533
[200]        valid_0's rmse: 1.60796
[300]        valid_0's rmse: 1.60671
[400]        valid_0's rmse: 1.60655
Early stopping, best iteration is:
[304]        valid_0's rmse: 1.60645
1.6285676539207288
trafficSource_adwordsClickInfo.isVideoAd   63
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6148
[200]        valid_0's rmse: 1.60798
[300]        valid_0's rmse: 1.60675
Early stopping, best iteration is:
[268]        valid_0's rmse: 1.60652
1.6283300575790873
trafficSource_adwordsClickInfo.isVideoAd   64
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61453
[200]        valid_0's rmse: 1.60754
[300]        valid_0's rmse: 1.60551
[400]        valid_0's rmse: 1.60764
Early stopping, best iteration is:
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[303]        valid_0's rmse: 1.60527
1.6270620680516168
trafficSource_adwordsClickInfo.isVideoAd   65
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61502
[200]        valid_0's rmse: 1.60843
[300]        valid_0's rmse: 1.60847
Early stopping, best iteration is:
[225]        valid_0's rmse: 1.608
1.6308482766230397
trafficSource_adwordsClickInfo.isVideoAd   66
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61356
[200]        valid_0's rmse: 1.60839
[300]        valid_0's rmse: 1.60664
Early stopping, best iteration is:
[293]        valid_0's rmse: 1.60639
1.6283783132045013
trafficSource_adwordsClickInfo.isVideoAd   67
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61417
[200]        valid_0's rmse: 1.60693
[300]        valid_0's rmse: 1.60473
[400]        valid_0's rmse: 1.60608
Early stopping, best iteration is:
[303]        valid_0's rmse: 1.60456
1.6263786579270796
trafficSource_adwordsClickInfo.isVideoAd   68
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.6138
[200]        valid_0's rmse: 1.60701
[300]        valid_0's rmse: 1.60491
[400]        valid_0's rmse: 1.60559
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.60461
1.6266827593833952
trafficSource_adwordsClickInfo.isVideoAd   69
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61488
[200]        valid_0's rmse: 1.60689
[300]        valid_0's rmse: 1.60472
Early stopping, best iteration is:
[288]        valid_0's rmse: 1.60455
1.626526446748377
trafficSource_adwordsClickInfo.isVideoAd   70
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61603
[200]        valid_0's rmse: 1.60858
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[300]        valid_0's rmse: 1.60714
[400]        valid_0's rmse: 1.60807
Early stopping, best iteration is:
[317]        valid_0's rmse: 1.60693
1.628653626105662
trafficSource_adwordsClickInfo.isVideoAd   71
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61471
[200]        valid_0's rmse: 1.60703
[300]        valid_0's rmse: 1.60522
[400]        valid_0's rmse: 1.6052
Early stopping, best iteration is:
[378]        valid_0's rmse: 1.60451
1.625506644622275
trafficSource_adwordsClickInfo.isVideoAd   72
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61463
[200]        valid_0's rmse: 1.60731
[300]        valid_0's rmse: 1.60498
[400]        valid_0's rmse: 1.60676
Early stopping, best iteration is:
[301]        valid_0's rmse: 1.60494
1.6269291750103936
trafficSource_adwordsClickInfo.isVideoAd   73
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61444
[200]        valid_0's rmse: 1.60709
[300]        valid_0's rmse: 1.60458
[400]        valid_0's rmse: 1.6062
Early stopping, best iteration is:
[316]        valid_0's rmse: 1.60421
1.626168118257207
trafficSource_adwordsClickInfo.isVideoAd   74
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61504
[200]        valid_0's rmse: 1.60726
[300]        valid_0's rmse: 1.60577
[400]        valid_0's rmse: 1.60789
Early stopping, best iteration is:
[323]        valid_0's rmse: 1.60551
1.627948927577682
trafficSource_adwordsClickInfo.isVideoAd   75
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60817
[300]        valid_0's rmse: 1.60648
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.60634
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1.6278360646379915
trafficSource_adwordsClickInfo.isVideoAd   76
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61612
[200]        valid_0's rmse: 1.60763
[300]        valid_0's rmse: 1.60669
[400]        valid_0's rmse: 1.60802
Early stopping, best iteration is:
[305]        valid_0's rmse: 1.60654
1.6281922709619354
trafficSource_adwordsClickInfo.isVideoAd   77
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61528
[200]        valid_0's rmse: 1.60757
[300]        valid_0's rmse: 1.60655
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60646
1.6284956076572172
trafficSource_adwordsClickInfo.isVideoAd   78
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61405
[200]        valid_0's rmse: 1.60729
[300]        valid_0's rmse: 1.60571
[400]        valid_0's rmse: 1.60699
Early stopping, best iteration is:
[307]        valid_0's rmse: 1.60559
1.6285602736516043
trafficSource_adwordsClickInfo.isVideoAd   79
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61629
[200]        valid_0's rmse: 1.60883
[300]        valid_0's rmse: 1.60767
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60753
1.629303267745314
trafficSource_adwordsClickInfo.isVideoAd   80
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61507
[200]        valid_0's rmse: 1.6068
[300]        valid_0's rmse: 1.60574
Early stopping, best iteration is:
[275]        valid_0's rmse: 1.60543
1.6272985829628444
trafficSource_adwordsClickInfo.isVideoAd   81
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61536
[200]        valid_0's rmse: 1.60911
[300]        valid_0's rmse: 1.60701
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[400]	valid_0's rmse: 1.60791
Early stopping, best iteration is:
[327]	valid_0's rmse: 1.60686
1.6282822950726055
trafficSource_adwordsClickInfo.isVideoAd   82
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61445
[200]	valid_0's rmse: 1.60634
[300]	valid_0's rmse: 1.60416
Early stopping, best iteration is:
[273]	valid_0's rmse: 1.60407
1.626092561676407
trafficSource_adwordsClickInfo.isVideoAd   83
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61508
[200]	valid_0's rmse: 1.60676
[300]	valid_0's rmse: 1.60585
Early stopping, best iteration is:
[292]	valid_0's rmse: 1.60566
1.6273712472328923
trafficSource_adwordsClickInfo.isVideoAd   84
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61534
[200]	valid_0's rmse: 1.607
[300]	valid_0's rmse: 1.60534
[400]	valid_0's rmse: 1.60668
Early stopping, best iteration is:
[309]	valid_0's rmse: 1.60516
1.6268358622651167
trafficSource_adwordsClickInfo.isVideoAd   85
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61541
[200]	valid_0's rmse: 1.6077
[300]	valid_0's rmse: 1.60588
[400]	valid_0's rmse: 1.60649
Early stopping, best iteration is:
[307]	valid_0's rmse: 1.60567
1.628333615834079
trafficSource_adwordsClickInfo.isVideoAd   86
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61581
[200]	valid_0's rmse: 1.60782
[300]	valid_0's rmse: 1.60651
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60629
1.627918709784926
trafficSource_adwordsClickInfo.isVideoAd   87
Training until validation scores don't improve for 100 rounds.
```

```
[100]	valid_0's rmse: 1.61555
[200]	valid_0's rmse: 1.60857
[300]	valid_0's rmse: 1.6069
[400]	valid_0's rmse: 1.60739
Early stopping, best iteration is:
[322]	valid_0's rmse: 1.60668
1.6283625482120003
trafficSource_adwordsClickInfo.isVideoAd   88
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61609
[200]	valid_0's rmse: 1.60768
[300]	valid_0's rmse: 1.60634
[400]	valid_0's rmse: 1.60823
Early stopping, best iteration is:
[301]	valid_0's rmse: 1.60634
1.627610010562457
trafficSource_adwordsClickInfo.isVideoAd   89
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61572
[200]	valid_0's rmse: 1.60851
[300]	valid_0's rmse: 1.60785
[400]	valid_0's rmse: 1.60843
Early stopping, best iteration is:
[332]	valid_0's rmse: 1.60742
1.6287218484469923
trafficSource_adwordsClickInfo.isVideoAd   90
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61445
[200]	valid_0's rmse: 1.60645
[300]	valid_0's rmse: 1.60459
Early stopping, best iteration is:
[297]	valid_0's rmse: 1.6045
1.6267508228900307
trafficSource_adwordsClickInfo.isVideoAd   91
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61449
[200]	valid_0's rmse: 1.60845
[300]	valid_0's rmse: 1.60621
Early stopping, best iteration is:
[296]	valid_0's rmse: 1.60604
1.627345273407452
trafficSource_adwordsClickInfo.isVideoAd   92
Training until validation scores don't improve for 100 rounds.
[100]	valid_0's rmse: 1.61582
[200]	valid_0's rmse: 1.60899
[300]	valid_0's rmse: 1.60714
Early stopping, best iteration is:
[299]	valid_0's rmse: 1.60712
```

```
1.628923945609692
trafficSource_adwordsClickInfo.isVideoAd   93
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61474
[200]        valid_0's rmse: 1.60744
[300]        valid_0's rmse: 1.60457
Early stopping, best iteration is:
[297]        valid_0's rmse: 1.60449
1.6264599654505714
trafficSource_adwordsClickInfo.isVideoAd   94
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61442
[200]        valid_0's rmse: 1.60744
[300]        valid_0's rmse: 1.6049
[400]        valid_0's rmse: 1.60658
Early stopping, best iteration is:
[321]        valid_0's rmse: 1.60458
1.6269799408305965
trafficSource_adwordsClickInfo.isVideoAd   95
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61497
[200]        valid_0's rmse: 1.60736
[300]        valid_0's rmse: 1.60538
Early stopping, best iteration is:
[291]        valid_0's rmse: 1.605
1.6272804568762846
trafficSource_adwordsClickInfo.isVideoAd   96
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61407
[200]        valid_0's rmse: 1.6084
[300]        valid_0's rmse: 1.60779
[400]        valid_0's rmse: 1.60895
Early stopping, best iteration is:
[309]        valid_0's rmse: 1.60751
1.6290378332597188
trafficSource_adwordsClickInfo.isVideoAd   97
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61582
[200]        valid_0's rmse: 1.60903
[300]        valid_0's rmse: 1.60641
[400]        valid_0's rmse: 1.60747
Early stopping, best iteration is:
[311]        valid_0's rmse: 1.60625
1.6274851466241187
trafficSource_adwordsClickInfo.isVideoAd   98
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61581
[200]        valid_0's rmse: 1.60837
```

```
[300]        valid_0's rmse: 1.60755
[400]        valid_0's rmse: 1.60705
[500]        valid_0's rmse: 1.60733
Early stopping, best iteration is:
[422]        valid_0's rmse: 1.6066
1.6270337740428542
trafficSource_adwordsClickInfo.isVideoAd   99
Training until validation scores don't improve for 100 rounds.
[100]        valid_0's rmse: 1.61587
[200]        valid_0's rmse: 1.60813
[300]        valid_0's rmse: 1.60736
Early stopping, best iteration is:
[273]        valid_0's rmse: 1.60702
1.6290624675323095
```

```
In [67]: print ("pval for visitId, totals_newVisits, geoNetwork_continent, trafficSource_adwor
         pval3 = p_val
         print (pval3)
```

```
pval for visitId, totals_newVisits, geoNetwork_continent, trafficSource_adwordsClickInfo.isVid
[0.0, 0.76, 0.48, 0.85]
```

```
In [ ]: tmp_sum = sum(i <= 1.60683 for i in ans)
        print (tmp_sum)
```

```
In [ ]: ans
```

```
In [ ]: #IGNORE
        for column_perm in ["totals_pageviews", "totals_hits", "visitNumber", "geoNetwork_coun
            for i in range(20):
                print(column_perm," ",i)
                train_permute = train_df.copy()
                train_permute[column_perm] = np.random.permutation(train_permute[column_perm])
                x, y = train_df.shape
                x1 = 3 * int(x / 4)

                dev_df = train_permute[0:x1]
                val_df = train_permute[x1:x]

                dev_X = dev_df
                val_X = val_df

                dev_y = np.log1p(dev_X["totals_transactionRevenue"].values)
                val_y = np.log1p(val_X["totals_transactionRevenue"].values)

                dev_X = dev_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId']
                val_X = val_X.drop(['totals_transactionRevenue'] + ['date'] + ['fullVisitorId']
```

```
                model, pred_val = run_lgb_perm(dev_X, dev_y, val_X, val_y)

                #new_test1.csv
                from sklearn import metrics
                pred_val[pred_val<0] = 0
                val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
                val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
                val_pred_df["PredictedRevenue"] = np.expm1(pred_val)
                #print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionRev
                val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "Predi
                print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionReve
```

In [ ]:
```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
import seaborn;
from sklearn import neighbors, datasets

import pylab as pl

from sklearn.decomposition import PCA
pca = PCA(n_components=15)
pca.fit(dev_X)
dev_X_reduced = pca.transform(X)
print("Reduced dataset shape:", dev_X_reduced.shape)

pca.fit(val_X)
val_X_reduced = pca.transform(X)
print("Reduced dataset shape:", val_X_reduced.shape)

pca.fit(test_X)
test_X_reduced = pca.transform(X)
print("Reduced dataset shape:", test_X_reduced.shape)


dev_X = dev_X.iloc[:, ]

cols = ['']
```

In [ ]:
```
import xgboost as xgb

dtrain = xgb.DMatrix(dev_X, label=dev_y)
dtest = xgb.DMatrix(val_X)

#set parameters for xgboost
params = {'max_depth':7,
```

```
            'eta':1,
            'silent':1,
            'objective':'reg:linear',
            'eval_metric':'rmse',
            'learning_rate':0.1
           }
num_rounds = 100

xb = xgb.train(params, dtrain, num_rounds)

y_pred_xgb = xb.predict(dtest)
```

In [ ]:
```
rmse = np.sqrt(mean_squared_error(val_y, y_pred_xgb))
print("RMSE: %f" % (rmse))

print("Mean squared error: %.2f"
      % mean_squared_error(val_y, y_pred_xgb))
# Explained variance score: 1 is perfect prediction
print('Variance score: %.2f' % r2_score(val_y, y_pred_xgb))
```

In [ ]:
```
from sklearn import metrics
y_pred_xgb[y_pred_xgb<0] = 0
val_pred_df = pd.DataFrame({"fullVisitorId":val_df["fullVisitorId"].values})
val_pred_df["transactionRevenue"] = val_df["totals_transactionRevenue"].values
val_pred_df["PredictedRevenue"] = np.expm1(y_pred_xgb)
#print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionRevenue"].v
val_pred_df = val_pred_df.groupby("fullVisitorId")["transactionRevenue", "PredictedReve
print(np.sqrt(metrics.mean_squared_error(np.log1p(val_pred_df["transactionRevenue"].va
```

In [ ]:
```
dtest_actual = xgb.DMatrix(test_X)
actual_testdata_pred_xgb_params = xb.predict(dtest_actual)

sub_df = pd.DataFrame({"fullVisitorId":test_id})
actual_testdata_pred_xgb_params[actual_testdata_pred_xgb_params<0] = 0
sub_df["PredictedLogRevenue"] = np.expm1(actual_testdata_pred_xgb_params)
sub_df = sub_df.groupby("fullVisitorId")["PredictedLogRevenue"].sum().reset_index()
sub_df.columns = ["fullVisitorId", "PredictedLogRevenue"]
sub_df["PredictedLogRevenue"] = np.log1p(sub_df["PredictedLogRevenue"])
sub_df.to_csv("new_test1_xgb.csv", index=False)
```

In [ ]:
```
dtest_actual = xgb.DMatrix(test_X)
actual_testdata_pred_xgb_params = xb.predict(dtest_actual)

#EXPORTING PREDICTIONS TO CSV

# key = pd.DataFrame(test[test.columns[0:1]])

# key['fare_amount'] = actual_testdata_pred_xgb_params
# key.to_csv('test_predictions_xgb_params.csv')
```