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TWO SIGMA

guowenrui

SigMA EDA versionnew

last run 7 days ago · IPython Notebook HTML

using data from Two Sigma: Using News to Predict Stock Movements · ⊘ Private

0

voters

Notebook   Code   Data (1)   Output   Comments (0)   Log   Versions (10)   Forks   Fork Notebook

Notebook

In [1]:
```python
# This Python 3 environment comes with many helpful analytics librari
es installed
# It is defined by the kaggle/python docker image: https://github.co
m/kaggle/docker-python
# For example, here's several helpful packages to load in

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_cs
v)

# Input data files are available in the "../input/" directory.
# For example, running this (by clicking run or pressing Shift+Enter)
 will list the files in the input directory

import os
print(os.listdir("../input"))

# Any results you write to the current directory are saved as output.
```

```
['marketdata_sample.csv', 'news_sample.csv']
```

In [2]:
```python
import numpy as np
import lightgbm as lgb
import pandas as pd
from kaggle.competitions import twosigmanews
import matplotlib.pyplot as plt
import random
from datetime import datetime, date
from xgboost import XGBClassifier
from sklearn import model_selection
from sklearn.metrics import mean_squared_error
import time
```

In [3]:
```python
# official way to get the data
from kaggle.competitions import twosigmanews
env = twosigmanews.make_env()
print('Done!')
```

```
Loading the data... This could take a minute.
Done!
Done!
```

In [4]:
```python
(market_train_df, news_train_df) = env.get_training_data()
```

In [5]:
```python
market_train_df['time'] = market_train_df['time'].dt.date
market_train_df = market_train_df.loc[market_train_df['time']>=date
(2010, 1, 1)]
```

In [6]:
```python
from multiprocessing import Pool

def create_lag(df_code,n_lag=[3,7,14,],shift_size=1):
    code = df_code['assetCode'].unique()

    for col in return_features:
        for window in n_lag:
            rolled = df_code[col].shift(shift_size).rolling(window=
window)
            lag_mean = rolled.mean()
            lag_max = rolled.max()
            lag_min = rolled.min()
            lag_std = rolled.std()
            df_code['%s_lag_%s_mean'%(col,window)] = lag_mean
            df_code['%s_lag_%s_max'%(col,window)] = lag_max
            df_code['%s_lag_%s_min'%(col,window)] = lag_min
#             df_code['%s_lag_%s_std'%(col,window)] = lag_std
    return df_code.fillna(-1)

def generate_lag_features(df,n_lag = [3,7,14]):
    features = ['time', 'assetCode', 'assetName', 'volume', 'close'
, 'open',
        'returnsClosePrevRaw1', 'returnsOpenPrevRaw1',
        'returnsClosePrevMktres1', 'returnsOpenPrevMktres1',
        'returnsClosePrevRaw10', 'returnsOpenPrevRaw10',
        'returnsClosePrevMktres10', 'returnsOpenPrevMktres10',
        'returnsOpenNextMktres10', 'universe']

    assetCodes = df['assetCode'].unique()
    print(assetCodes)
    all_df = []
    df_codes = df.groupby('assetCode')
    df_codes = [df_code[1][['time','assetCode']+return_features] fo
r df_code in df_codes]
    print('total %s df'%len(df_codes))

    pool = Pool(4)
    all_df = pool.map(create_lag, df_codes)

    new_df = pd.concat(all_df)
    new_df.drop(return_features,axis=1,inplace=True)
    pool.close()

    return new_df
```

In [7]:
```python
# return_features = ['close']
# new_df = generate_lag_features(market_train_df,n_lag = 5)
# market_train_df = pd.merge(market_train_df,new_df,how='left',on=['t
ime','assetCode'])
```

In [8]:
```python
return_features = ['returnsClosePrevMktres10','returnsClosePrevRaw1
0','open','close']
n_lag = [3,7,14]
new_df = generate_lag_features(market_train_df,n_lag=n_lag)
market_train_df = pd.merge(market_train_df,new_df,how='left',on=['t
```

```
ime','assetCode'])
```

```
['A.N' 'AAI.N' 'AAP.N' ... 'FCB.N' 'AMC.N' 'CVGW.O']
total 3327 df
```

In [9]:
```python
print(market_train_df.columns)
```

```
Index(['time', 'assetCode', 'assetName', 'volume', 'close', 'open',
       'returnsClosePrevRaw1', 'returnsOpenPrevRaw1',
       'returnsClosePrevMktres1', 'returnsOpenPrevMktres1',
       'returnsClosePrevRaw10', 'returnsOpenPrevRaw10',
       'returnsClosePrevMktres10', 'returnsOpenPrevMktres10',
       'returnsOpenNextMktres10', 'universe',
       'returnsClosePrevMktres10_lag_3_mean',
       'returnsClosePrevMktres10_lag_3_max',
       'returnsClosePrevMktres10_lag_3_min',
       'returnsClosePrevMktres10_lag_7_mean',
       'returnsClosePrevMktres10_lag_7_max',
       'returnsClosePrevMktres10_lag_7_min',
       'returnsClosePrevMktres10_lag_14_mean',
       'returnsClosePrevMktres10_lag_14_max',
       'returnsClosePrevMktres10_lag_14_min',
       'returnsClosePrevRaw10_lag_3_mean', 'returnsClosePrevRaw10_l
ag_3_max',
       'returnsClosePrevRaw10_lag_3_min', 'returnsClosePrevRaw10_la
g_7_mean',
       'returnsClosePrevRaw10_lag_7_max', 'returnsClosePrevRaw10_la
g_7_min',
       'returnsClosePrevRaw10_lag_14_mean', 'returnsClosePrevRaw10_
lag_14_max',
       'returnsClosePrevRaw10_lag_14_min', 'open_lag_3_mean', 'open
_lag_3_max',
       'open_lag_3_min', 'open_lag_7_mean', 'open_lag_7_max', 'open
_lag_7_min',
       'open_lag_14_mean', 'open_lag_14_max', 'open_lag_14_min',
       'close_lag_3_mean', 'close_lag_3_max', 'close_lag_3_min',
       'close_lag_7_mean', 'close_lag_7_max', 'close_lag_7_min',
       'close_lag_14_mean', 'close_lag_14_max', 'close_lag_14_mi
n'],
      dtype='object')
```

In [10]:
```python
# return_features = ['open']
# new_df = generate_lag_features(market_train_df,n_lag=[3,7,14])
# market_train_df = pd.merge(market_train_df,new_df,how='left',on=['t
ime','assetCode'])
```

In [11]:
```python
def mis_impute(data):
    for i in data.columns:
        if data[i].dtype == "object":
            data[i] = data[i].fillna("other")
        elif (data[i].dtype == "int64" or data[i].dtype == "float6
4"):
            data[i] = data[i].fillna(data[i].mean())
```

```
                data[i] = data[i].fillna(data[i].mean())
            else:
                pass
        return data

    market_train_df = mis_impute(market_train_df)
```

In [12]:
```
def data_prep(market_train):
    lbl = {k: v for v, k in enumerate(market_train['assetCode'].uni
que())}
    market_train['assetCodeT'] = market_train['assetCode'].map(lbl)
    market_train = market_train.dropna(axis=0)
    return market_train

market_train_df = data_prep(market_train_df)
# # check the shape
print(market_train_df.shape)
```

```
(2946739, 53)
```

In [13]:
```
from sklearn.preprocessing import LabelEncoder

up = market_train_df['returnsOpenNextMktres10'] >= 0


universe = market_train_df['universe'].values
d = market_train_df['time']

fcol = [c for c in market_train_df if c not in ['assetCode', 'asset
Codes', 'assetCodesLen', 'assetName', 'audiences',
                                        'firstCreated', 'headl
ine', 'headlineTag', 'marketCommentary', 'provider',
                                        'returnsOpenNextMktres
10', 'sourceId', 'subjects', 'time', 'time_x', 'universe','sourceTi
mestamp']]

X = market_train_df[fcol].values
up = up.values
r = market_train_df.returnsOpenNextMktres10.values

# Scaling of X values
# It is good to keep these scaling values for later
mins = np.min(X, axis=0)
maxs = np.max(X, axis=0)
rng = maxs - mins
X = 1 - ((maxs - X) / rng)

# Sanity check
assert X.shape[0] == up.shape[0] == r.shape[0]

from xgboost import XGBClassifier
from sklearn import model_selection
from sklearn.metrics import mean_squared_error
import time
```

```
X_train, X_test, up_train, up_test, r_train, r_test,u_train,u_test,
d_train,d_test = model_selection.train_test_split(X, up, r,universe
,d, test_size=0.25, random_state=99)


# te = market_train_df['time']>date(2015, 1, 1)

# tt = 0
# for tt,i in enumerate(te.values):
#       if i:
#           idx = tt
#           print(i,tt)
#           break
# print(idx)
# # for ind_tr, ind_te in tscv.split(X):
# #     print(ind_tr)
# X_train, X_test = X[:idx],X[idx:]

# up_train, up_test = up[:idx],up[idx:]
# r_train, r_test = r[:idx],r[idx:]
# u_train,u_test = universe[:idx],universe[idx:]
# d_train,d_test = d[:idx],d[idx:]

# train_data = lgb.Dataset(X_train, label=up_train.astype(int))
train_data = lgb.Dataset(X, label=up.astype(int))
test_data = lgb.Dataset(X_test, label=up_test.astype(int))
```

In [14]:

```
# these are tuned params I found
x_1 = [0.19000424246380565, 2452, 212, 239, 202]
x_2 = [0.19016805202090095, 2583, 213, 172, 220]
x_3 = [0.19564034613157152, 2452, 210, 160, 219]
x_4 = [0.19016805202090095, 2500, 213, 150, 202]
x_5 = [0.19000424246380565, 2600, 215, 140, 220]
x_6 = [0.19000424246380565, 2652, 216, 152, 202]

"""
x_1 = [0.19000424246380565, 2452, 212, 328, 202]
x_2 = [0.19016805202090095, 2583, 213, 312, 220]
x_3 = [0.19564034613157152, 2455, 210, 330, 219]
x_4 = [0.15000000000000000, 2600, 220, 340, 202]
x_5 = [0.15000000000000000, 2600, 220, 330, 220]
x_6 = [0.15000000000000000, 2400, 220, 340, 202]
"""
print(up_train)
def exp_loss(p,y):
    y = y.get_label()
#     p = p.get_label()
    grad = -y*(1.0-1.0/(1.0+np.exp(-y*p)))
    hess = -(np.exp(y*p)*(y*p-1)-1)/((np.exp(y*p)+1)**2)

    return grad,hess

params_1 = {
        'task': 'train',
        'boosting_type': 'gbdt',
        'objective': 'binary',
#         'objective': 'regression',
```

```python
        'learning_rate': x_1[0],
        'num_leaves': x_1[1],
        'min_data_in_leaf': x_1[2],
#        'num_iteration': x_1[3],
        'num_iteration': 239,
        'max_bin': x_1[4],
        'verbose': 1
    }

params_2 = {
        'task': 'train',
        'boosting_type': 'gbdt',
        'objective': 'binary',
#        'objective': 'regression',
        'learning_rate': x_2[0],
        'num_leaves': x_2[1],
        'min_data_in_leaf': x_2[2],
#        'num_iteration': x_2[3],
        'num_iteration': 172,
        'max_bin': x_2[4],
        'verbose': 1
    }

params_3 = {
        'task': 'train',
        'boosting_type': 'gbdt',
        'objective': 'binary',
        'learning_rate': x_3[0],
        'num_leaves': x_3[1],
        'min_data_in_leaf': x_3[2],
        'num_iteration': x_3[3],
        'max_bin': x_3[4],
        'verbose': 1
    }

params_4 = {
        'task': 'train',
        'boosting_type': 'gbdt',
        'objective': 'binary',
        'learning_rate': x_4[0],
        'num_leaves': x_4[1],
        'min_data_in_leaf': x_4[2],
        'num_iteration': x_4[3],
        'max_bin': x_4[4],
        'verbose': 1
    }

params_5 = {
        'task': 'train',
        'boosting_type': 'gbdt',#dart
        'objective': 'binary',
        'learning_rate': x_5[0],
        'num_leaves': x_5[1],
        'min_data_in_leaf': x_5[2],
        'num_iteration': x_5[3],
        'max_bin': x_5[4],
        'verbose': 1
    }
```

```python
params_6 = {
        'task': 'train',
        'boosting_type': 'gbdt',
        'objective': 'binary',
        'learning_rate': x_6[0],
        'num_leaves': x_6[1],
        'min_data_in_leaf': x_6[2],
        'num_iteration': x_6[3],
        'max_bin': x_6[4],
        'verbose': 1
    }

gbm_1 = lgb.train(params_1,
        train_data,
        num_boost_round=100,
        valid_sets=test_data,
        early_stopping_rounds=5,
#        fobj=exp_loss,
        )

gbm_2 = lgb.train(params_2,
        train_data,
        num_boost_round=100,
        valid_sets=test_data,
        early_stopping_rounds=5,
#        fobj=exp_loss,
        )

gbm_3 = lgb.train(params_3,
        train_data,
        num_boost_round=100,
        valid_sets=test_data,
        early_stopping_rounds=5,
#        fobj=exp_loss,
        )

gbm_4 = lgb.train(params_4,
        train_data,
        num_boost_round=100,
        valid_sets=test_data,
        early_stopping_rounds=5,
#        fobj=exp_loss,
        )

gbm_5 = lgb.train(params_5,
        train_data,
        num_boost_round=100,
        valid_sets=test_data,
        early_stopping_rounds=5,
#        fobj=exp_loss,
        )

gbm_6 = lgb.train(params_6,
        train_data,
        num_boost_round=100,
        valid_sets=test_data,
```

```
        early_stopping_rounds=10,
#         fobj=exp_loss,
        )
```

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

```
/opt/conda/lib/python3.6/site-packages/lightgbm/engine.py:116: User
Warning: Found `num_iteration` in params. Will use it instead of ar
gument
  warnings.warn("Found `{}` in params. Will use it instead of argum
ent".format(alias))
```

```
[1]     valid_0's binary_logloss: 0.686994
Training until validation scores don't improve for 5 rounds.
[2]     valid_0's binary_logloss: 0.682339
[3]     valid_0's binary_logloss: 0.67858
[4]     valid_0's binary_logloss: 0.675405
[5]     valid_0's binary_logloss: 0.672512
[6]     valid_0's binary_logloss: 0.669836
[7]     valid_0's binary_logloss: 0.667405
[8]     valid_0's binary_logloss: 0.665102
[9]     valid_0's binary_logloss: 0.66282
[10]    valid_0's binary_logloss: 0.660754
[11]    valid_0's binary_logloss: 0.658755
[12]    valid_0's binary_logloss: 0.65682
[13]    valid_0's binary_logloss: 0.655107
[14]    valid_0's binary_logloss: 0.653134
[15]    valid_0's binary_logloss: 0.650867
[16]    valid_0's binary_logloss: 0.648998
[17]    valid_0's binary_logloss: 0.647163
[18]    valid_0's binary_logloss: 0.645407
[19]    valid_0's binary_logloss: 0.643415
[20]    valid_0's binary_logloss: 0.641469
[21]    valid_0's binary_logloss: 0.639921
[22]    valid_0's binary_logloss: 0.637682
[23]    valid_0's binary_logloss: 0.636229
[24]    valid_0's binary_logloss: 0.634618
[25]    valid_0's binary_logloss: 0.632358
[26]    valid_0's binary_logloss: 0.631015
[27]    valid_0's binary_logloss: 0.628513
[28]    valid_0's binary_logloss: 0.627165
[29]    valid_0's binary_logloss: 0.625658
[30]    valid_0's binary_logloss: 0.624419
[31]    valid_0's binary_logloss: 0.622115
[32]    valid_0's binary_logloss: 0.620924
[33]    valid_0's binary_logloss: 0.619606
[34]    valid_0's binary_logloss: 0.618494
[35]    valid_0's binary_logloss: 0.616221
[36]    valid_0's binary_logloss: 0.615163
[37]    valid_0's binary_logloss: 0.613941
[38]    valid_0's binary_logloss: 0.612844
[39]    valid_0's binary_logloss: 0.6109
[40]    valid_0's binary_logloss: 0.609566
[41]    valid_0's binary_logloss: 0.608185
[42]    valid_0's binary_logloss: 0.606599
[43]    valid_0's binary_logloss: 0.605469
[44]    valid_0's binary_logloss: 0.604247
```

```
[45]     valid_0's binary_logloss: 0.602258
[46]     valid_0's binary_logloss: 0.600935
[47]     valid_0's binary_logloss: 0.599593
[48]     valid_0's binary_logloss: 0.598479
[49]     valid_0's binary_logloss: 0.596633
[50]     valid_0's binary_logloss: 0.595531
[51]     valid_0's binary_logloss: 0.59412
[52]     valid_0's binary_logloss: 0.59282
[53]     valid_0's binary_logloss: 0.590581
[54]     valid_0's binary_logloss: 0.589567
[55]     valid_0's binary_logloss: 0.588006
[56]     valid_0's binary_logloss: 0.587035
[57]     valid_0's binary_logloss: 0.586022
[58]     valid_0's binary_logloss: 0.584972
[59]     valid_0's binary_logloss: 0.583537
[60]     valid_0's binary_logloss: 0.58254
[61]     valid_0's binary_logloss: 0.581501
[62]     valid_0's binary_logloss: 0.580379
[63]     valid_0's binary_logloss: 0.57928
[64]     valid_0's binary_logloss: 0.577643
[65]     valid_0's binary_logloss: 0.576206
[66]     valid_0's binary_logloss: 0.57522
[67]     valid_0's binary_logloss: 0.573723
[68]     valid_0's binary_logloss: 0.572774
[69]     valid_0's binary_logloss: 0.571826
[70]     valid_0's binary_logloss: 0.570547
[71]     valid_0's binary_logloss: 0.569375
[72]     valid_0's binary_logloss: 0.568124
[73]     valid_0's binary_logloss: 0.567199
[74]     valid_0's binary_logloss: 0.56553
[75]     valid_0's binary_logloss: 0.564122
[76]     valid_0's binary_logloss: 0.563165
[77]     valid_0's binary_logloss: 0.561982
[78]     valid_0's binary_logloss: 0.561029
[79]     valid_0's binary_logloss: 0.560058
[80]     valid_0's binary_logloss: 0.558597
[81]     valid_0's binary_logloss: 0.557221
[82]     valid_0's binary_logloss: 0.556026
[83]     valid_0's binary_logloss: 0.555089
[84]     valid_0's binary_logloss: 0.553827
[85]     valid_0's binary_logloss: 0.55276
[86]     valid_0's binary_logloss: 0.551671
[87]     valid_0's binary_logloss: 0.550624
[88]     valid_0's binary_logloss: 0.549573
[89]     valid_0's binary_logloss: 0.548638
[90]     valid_0's binary_logloss: 0.54766
[91]     valid_0's binary_logloss: 0.546575
[92]     valid_0's binary_logloss: 0.545335
[93]     valid_0's binary_logloss: 0.544336
[94]     valid_0's binary_logloss: 0.54344
[95]     valid_0's binary_logloss: 0.542091
[96]     valid_0's binary_logloss: 0.541171
[97]     valid_0's binary_logloss: 0.540092
[98]     valid_0's binary_logloss: 0.538765
[99]     valid_0's binary_logloss: 0.537835
[100]    valid_0's binary_logloss: 0.536697
[101]    valid_0's binary_logloss: 0.535807
[102]    valid_0's binary_logloss: 0.534872
[103]    valid_0's binary_logloss: 0.534017
```

```
[103]    valid_0's binary_logloss: 0.534817
[104]    valid_0's binary_logloss: 0.532747
[105]    valid_0's binary_logloss: 0.531272
[106]    valid_0's binary_logloss: 0.530357
[107]    valid_0's binary_logloss: 0.529522
[108]    valid_0's binary_logloss: 0.528463
[109]    valid_0's binary_logloss: 0.527606
[110]    valid_0's binary_logloss: 0.526667
[111]    valid_0's binary_logloss: 0.525666
[112]    valid_0's binary_logloss: 0.524702
[113]    valid_0's binary_logloss: 0.523648
[114]    valid_0's binary_logloss: 0.522235
[115]    valid_0's binary_logloss: 0.521265
[116]    valid_0's binary_logloss: 0.520344
[117]    valid_0's binary_logloss: 0.519501
[118]    valid_0's binary_logloss: 0.518684
[119]    valid_0's binary_logloss: 0.51748
[120]    valid_0's binary_logloss: 0.516615
[121]    valid_0's binary_logloss: 0.515099
[122]    valid_0's binary_logloss: 0.514215
[123]    valid_0's binary_logloss: 0.51339
[124]    valid_0's binary_logloss: 0.512556
[125]    valid_0's binary_logloss: 0.511458
[126]    valid_0's binary_logloss: 0.510546
[127]    valid_0's binary_logloss: 0.509522
[128]    valid_0's binary_logloss: 0.508619
[129]    valid_0's binary_logloss: 0.507818
[130]    valid_0's binary_logloss: 0.507027
[131]    valid_0's binary_logloss: 0.506254
[132]    valid_0's binary_logloss: 0.505455
[133]    valid_0's binary_logloss: 0.504386
[134]    valid_0's binary_logloss: 0.503566
[135]    valid_0's binary_logloss: 0.502546
[136]    valid_0's binary_logloss: 0.501577
[137]    valid_0's binary_logloss: 0.500705
[138]    valid_0's binary_logloss: 0.499436
[139]    valid_0's binary_logloss: 0.498642
[140]    valid_0's binary_logloss: 0.497899
[141]    valid_0's binary_logloss: 0.497122
[142]    valid_0's binary_logloss: 0.496361
[143]    valid_0's binary_logloss: 0.495591
[144]    valid_0's binary_logloss: 0.49452
[145]    valid_0's binary_logloss: 0.493722
[146]    valid_0's binary_logloss: 0.492699
[147]    valid_0's binary_logloss: 0.491781
[148]    valid_0's binary_logloss: 0.490993
[149]    valid_0's binary_logloss: 0.489998
[150]    valid_0's binary_logloss: 0.489182
[151]    valid_0's binary_logloss: 0.488409
[152]    valid_0's binary_logloss: 0.487468
[153]    valid_0's binary_logloss: 0.486711
[154]    valid_0's binary_logloss: 0.485921
[155]    valid_0's binary_logloss: 0.485177
[156]    valid_0's binary_logloss: 0.484389
[157]    valid_0's binary_logloss: 0.483344
[158]    valid_0's binary_logloss: 0.482592
[159]    valid_0's binary_logloss: 0.481546
[160]    valid_0's binary_logloss: 0.480848
[161]    valid_0's binary_logloss: 0.480042
```

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[162]    valid_0's binary_logloss: 0.479334
[163]    valid_0's binary_logloss: 0.478616
[164]    valid_0's binary_logloss: 0.477882
[165]    valid_0's binary_logloss: 0.477097
[166]    valid_0's binary_logloss: 0.476282
[167]    valid_0's binary_logloss: 0.475364
[168]    valid_0's binary_logloss: 0.474635
[169]    valid_0's binary_logloss: 0.473961
[170]    valid_0's binary_logloss: 0.473075
[171]    valid_0's binary_logloss: 0.472148
[172]    valid_0's binary_logloss: 0.471436
[173]    valid_0's binary_logloss: 0.470301
[174]    valid_0's binary_logloss: 0.469471
[175]    valid_0's binary_logloss: 0.468772
[176]    valid_0's binary_logloss: 0.467762
[177]    valid_0's binary_logloss: 0.467079
[178]    valid_0's binary_logloss: 0.465963
[179]    valid_0's binary_logloss: 0.46526
[180]    valid_0's binary_logloss: 0.464548
[181]    valid_0's binary_logloss: 0.463744
[182]    valid_0's binary_logloss: 0.463065
[183]    valid_0's binary_logloss: 0.462152
[184]    valid_0's binary_logloss: 0.461449
[185]    valid_0's binary_logloss: 0.460823
[186]    valid_0's binary_logloss: 0.4599
[187]    valid_0's binary_logloss: 0.459237
[188]    valid_0's binary_logloss: 0.458552
[189]    valid_0's binary_logloss: 0.457808
[190]    valid_0's binary_logloss: 0.456813
[191]    valid_0's binary_logloss: 0.456133
[192]    valid_0's binary_logloss: 0.455318
[193]    valid_0's binary_logloss: 0.454433
[194]    valid_0's binary_logloss: 0.453769
[195]    valid_0's binary_logloss: 0.453107
[196]    valid_0's binary_logloss: 0.452328
[197]    valid_0's binary_logloss: 0.451629
[198]    valid_0's binary_logloss: 0.450969
[199]    valid_0's binary_logloss: 0.450228
[200]    valid_0's binary_logloss: 0.449482
[201]    valid_0's binary_logloss: 0.448737
[202]    valid_0's binary_logloss: 0.448003
[203]    valid_0's binary_logloss: 0.447359
[204]    valid_0's binary_logloss: 0.44668
[205]    valid_0's binary_logloss: 0.445598
[206]    valid_0's binary_logloss: 0.444892
[207]    valid_0's binary_logloss: 0.444267
[208]    valid_0's binary_logloss: 0.443463
[209]    valid_0's binary_logloss: 0.442796
[210]    valid_0's binary_logloss: 0.442069
[211]    valid_0's binary_logloss: 0.441235
[212]    valid_0's binary_logloss: 0.440585
[213]    valid_0's binary_logloss: 0.439733
[214]    valid_0's binary_logloss: 0.439051
[215]    valid_0's binary_logloss: 0.438419
[216]    valid_0's binary_logloss: 0.437796
[217]    valid_0's binary_logloss: 0.437035
[218]    valid_0's binary_logloss: 0.436338
[219]    valid_0's binary_logloss: 0.435362
```

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[220]    valid_0's binary_logloss: 0.434753
[221]    valid_0's binary_logloss: 0.433598
[222]    valid_0's binary_logloss: 0.432927
[223]    valid_0's binary_logloss: 0.432284
[224]    valid_0's binary_logloss: 0.431396
[225]    valid_0's binary_logloss: 0.430404
[226]    valid_0's binary_logloss: 0.429742
[227]    valid_0's binary_logloss: 0.42865
[228]    valid_0's binary_logloss: 0.42802
[229]    valid_0's binary_logloss: 0.427104
[230]    valid_0's binary_logloss: 0.426451
[231]    valid_0's binary_logloss: 0.425726
[232]    valid_0's binary_logloss: 0.42479
[233]    valid_0's binary_logloss: 0.42402
[234]    valid_0's binary_logloss: 0.423374
[235]    valid_0's binary_logloss: 0.422793
[236]    valid_0's binary_logloss: 0.421992
[237]    valid_0's binary_logloss: 0.421386
[238]    valid_0's binary_logloss: 0.420571
[239]    valid_0's binary_logloss: 0.419976
Did not meet early stopping. Best iteration is:
[239]    valid_0's binary_logloss: 0.419976
[1]      valid_0's binary_logloss: 0.686886
Training until validation scores don't improve for 5 rounds.
[2]      valid_0's binary_logloss: 0.682133
[3]      valid_0's binary_logloss: 0.678282
[4]      valid_0's binary_logloss: 0.674973
[5]      valid_0's binary_logloss: 0.671937
[6]      valid_0's binary_logloss: 0.669164
[7]      valid_0's binary_logloss: 0.666692
[8]      valid_0's binary_logloss: 0.664437
[9]      valid_0's binary_logloss: 0.66215
[10]     valid_0's binary_logloss: 0.659942
[11]     valid_0's binary_logloss: 0.657888
[12]     valid_0's binary_logloss: 0.65578
[13]     valid_0's binary_logloss: 0.653984
[14]     valid_0's binary_logloss: 0.651522
[15]     valid_0's binary_logloss: 0.649326
[16]     valid_0's binary_logloss: 0.647534
[17]     valid_0's binary_logloss: 0.645585
[18]     valid_0's binary_logloss: 0.643635
[19]     valid_0's binary_logloss: 0.641762
[20]     valid_0's binary_logloss: 0.640166
[21]     valid_0's binary_logloss: 0.637578
[22]     valid_0's binary_logloss: 0.636103
[23]     valid_0's binary_logloss: 0.634666
[24]     valid_0's binary_logloss: 0.633046
[25]     valid_0's binary_logloss: 0.63146
[26]     valid_0's binary_logloss: 0.629698
[27]     valid_0's binary_logloss: 0.627133
[28]     valid_0's binary_logloss: 0.625779
[29]     valid_0's binary_logloss: 0.624642
[30]     valid_0's binary_logloss: 0.622398
[31]     valid_0's binary_logloss: 0.621089
[32]     valid_0's binary_logloss: 0.61887
[33]     valid_0's binary_logloss: 0.617764
[34]     valid_0's binary_logloss: 0.616591
[35]     valid_0's binary_logloss: 0.614986
```

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[36]    valid_0's binary_logloss: 0.612784
[37]    valid_0's binary_logloss: 0.611611
[38]    valid_0's binary_logloss: 0.60993
[39]    valid_0's binary_logloss: 0.608812
[40]    valid_0's binary_logloss: 0.606636
[41]    valid_0's binary_logloss: 0.605384
[42]    valid_0's binary_logloss: 0.603696
[43]    valid_0's binary_logloss: 0.60221
[44]    valid_0's binary_logloss: 0.601087
[45]    valid_0's binary_logloss: 0.59973
[46]    valid_0's binary_logloss: 0.598498
[47]    valid_0's binary_logloss: 0.596989
[48]    valid_0's binary_logloss: 0.595841
[49]    valid_0's binary_logloss: 0.594593
[50]    valid_0's binary_logloss: 0.593511
[51]    valid_0's binary_logloss: 0.591528
[52]    valid_0's binary_logloss: 0.590423
[53]    valid_0's binary_logloss: 0.589244
[54]    valid_0's binary_logloss: 0.587777
[55]    valid_0's binary_logloss: 0.586511
[56]    valid_0's binary_logloss: 0.584962
[57]    valid_0's binary_logloss: 0.583268
[58]    valid_0's binary_logloss: 0.581836
[59]    valid_0's binary_logloss: 0.580235
[60]    valid_0's binary_logloss: 0.579183
[61]    valid_0's binary_logloss: 0.577662
[62]    valid_0's binary_logloss: 0.576671
[63]    valid_0's binary_logloss: 0.575591
[64]    valid_0's binary_logloss: 0.574518
[65]    valid_0's binary_logloss: 0.57351
[66]    valid_0's binary_logloss: 0.571828
[67]    valid_0's binary_logloss: 0.570822
[68]    valid_0's binary_logloss: 0.569815
[69]    valid_0's binary_logloss: 0.568072
[70]    valid_0's binary_logloss: 0.566998
[71]    valid_0's binary_logloss: 0.565923
[72]    valid_0's binary_logloss: 0.564936
[73]    valid_0's binary_logloss: 0.563525
[74]    valid_0's binary_logloss: 0.562537
[75]    valid_0's binary_logloss: 0.561048
[76]    valid_0's binary_logloss: 0.559562
[77]    valid_0's binary_logloss: 0.558635
[78]    valid_0's binary_logloss: 0.557439
[79]    valid_0's binary_logloss: 0.556386
[80]    valid_0's binary_logloss: 0.555079
[81]    valid_0's binary_logloss: 0.554084
[82]    valid_0's binary_logloss: 0.553094
[83]    valid_0's binary_logloss: 0.551688
[84]    valid_0's binary_logloss: 0.550571
[85]    valid_0's binary_logloss: 0.549537
[86]    valid_0's binary_logloss: 0.548346
[87]    valid_0's binary_logloss: 0.547469
[88]    valid_0's binary_logloss: 0.546102
[89]    valid_0's binary_logloss: 0.545141
[90]    valid_0's binary_logloss: 0.544235
[91]    valid_0's binary_logloss: 0.542958
[92]    valid_0's binary_logloss: 0.542047
[93]    valid_0's binary_logloss: 0.540651
```

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[94]    valid_0's binary_logloss: 0.539412
[95]    valid_0's binary_logloss: 0.538496
[96]    valid_0's binary_logloss: 0.537177
[97]    valid_0's binary_logloss: 0.536235
[98]    valid_0's binary_logloss: 0.535158
[99]    valid_0's binary_logloss: 0.53417
[100]   valid_0's binary_logloss: 0.532953
[101]   valid_0's binary_logloss: 0.531884
[102]   valid_0's binary_logloss: 0.531015
[103]   valid_0's binary_logloss: 0.529694
[104]   valid_0's binary_logloss: 0.528851
[105]   valid_0's binary_logloss: 0.527666
[106]   valid_0's binary_logloss: 0.526791
[107]   valid_0's binary_logloss: 0.525797
[108]   valid_0's binary_logloss: 0.524309
[109]   valid_0's binary_logloss: 0.523427
[110]   valid_0's binary_logloss: 0.5225
[111]   valid_0's binary_logloss: 0.521554
[112]   valid_0's binary_logloss: 0.520556
[113]   valid_0's binary_logloss: 0.519155
[114]   valid_0's binary_logloss: 0.518285
[115]   valid_0's binary_logloss: 0.517406
[116]   valid_0's binary_logloss: 0.516548
[117]   valid_0's binary_logloss: 0.515635
[118]   valid_0's binary_logloss: 0.514648
[119]   valid_0's binary_logloss: 0.51379
[120]   valid_0's binary_logloss: 0.512683
[121]   valid_0's binary_logloss: 0.511546
[122]   valid_0's binary_logloss: 0.510651
[123]   valid_0's binary_logloss: 0.509607
[124]   valid_0's binary_logloss: 0.508725
[125]   valid_0's binary_logloss: 0.507887
[126]   valid_0's binary_logloss: 0.506994
[127]   valid_0's binary_logloss: 0.505889
[128]   valid_0's binary_logloss: 0.504618
[129]   valid_0's binary_logloss: 0.503818
[130]   valid_0's binary_logloss: 0.50241
[131]   valid_0's binary_logloss: 0.501503
[132]   valid_0's binary_logloss: 0.500697
[133]   valid_0's binary_logloss: 0.499846
[134]   valid_0's binary_logloss: 0.498636
[135]   valid_0's binary_logloss: 0.497776
[136]   valid_0's binary_logloss: 0.496478
[137]   valid_0's binary_logloss: 0.49572
[138]   valid_0's binary_logloss: 0.494762
[139]   valid_0's binary_logloss: 0.493778
[140]   valid_0's binary_logloss: 0.492943
[141]   valid_0's binary_logloss: 0.49178
[142]   valid_0's binary_logloss: 0.490699
[143]   valid_0's binary_logloss: 0.489916
[144]   valid_0's binary_logloss: 0.489107
[145]   valid_0's binary_logloss: 0.488129
[146]   valid_0's binary_logloss: 0.487364
[147]   valid_0's binary_logloss: 0.486386
[148]   valid_0's binary_logloss: 0.485089
[149]   valid_0's binary_logloss: 0.48429
[150]   valid_0's binary_logloss: 0.483447
[151]   valid_0's binary_logloss: 0.482653
[152]   valid_0's binary_logloss: 0.481635
```

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[153]    valid_0's binary_logloss: 0.480848
[154]    valid_0's binary_logloss: 0.479997
[155]    valid_0's binary_logloss: 0.479258
[156]    valid_0's binary_logloss: 0.478482
[157]    valid_0's binary_logloss: 0.47723
[158]    valid_0's binary_logloss: 0.476474
[159]    valid_0's binary_logloss: 0.475746
[160]    valid_0's binary_logloss: 0.474912
[161]    valid_0's binary_logloss: 0.474022
[162]    valid_0's binary_logloss: 0.473049
[163]    valid_0's binary_logloss: 0.472286
[164]    valid_0's binary_logloss: 0.471509
[165]    valid_0's binary_logloss: 0.470673
[166]    valid_0's binary_logloss: 0.469904
[167]    valid_0's binary_logloss: 0.468996
[168]    valid_0's binary_logloss: 0.467926
[169]    valid_0's binary_logloss: 0.467161
[170]    valid_0's binary_logloss: 0.466318
[171]    valid_0's binary_logloss: 0.46552
[172]    valid_0's binary_logloss: 0.464558
Did not meet early stopping. Best iteration is:
[172]    valid_0's binary_logloss: 0.464558
[1]      valid_0's binary_logloss: 0.686832
Training until validation scores don't improve for 5 rounds.
[2]      valid_0's binary_logloss: 0.682093
[3]      valid_0's binary_logloss: 0.678226
[4]      valid_0's binary_logloss: 0.674937
[5]      valid_0's binary_logloss: 0.671913
[6]      valid_0's binary_logloss: 0.669218
[7]      valid_0's binary_logloss: 0.666809
[8]      valid_0's binary_logloss: 0.664577
[9]      valid_0's binary_logloss: 0.662527
[10]     valid_0's binary_logloss: 0.660427
[11]     valid_0's binary_logloss: 0.658322
[12]     valid_0's binary_logloss: 0.655862
[13]     valid_0's binary_logloss: 0.654013
[14]     valid_0's binary_logloss: 0.651935
[15]     valid_0's binary_logloss: 0.649849
[16]     valid_0's binary_logloss: 0.648003
[17]     valid_0's binary_logloss: 0.645964
[18]     valid_0's binary_logloss: 0.644352
[19]     valid_0's binary_logloss: 0.641965
[20]     valid_0's binary_logloss: 0.640286
[21]     valid_0's binary_logloss: 0.638755
[22]     valid_0's binary_logloss: 0.636478
[23]     valid_0's binary_logloss: 0.634959
[24]     valid_0's binary_logloss: 0.632753
[25]     valid_0's binary_logloss: 0.631382
[26]     valid_0's binary_logloss: 0.630002
[27]     valid_0's binary_logloss: 0.628483
[28]     valid_0's binary_logloss: 0.626426
[29]     valid_0's binary_logloss: 0.62519
[30]     valid_0's binary_logloss: 0.622884
[31]     valid_0's binary_logloss: 0.6212
[32]     valid_0's binary_logloss: 0.620007
[33]     valid_0's binary_logloss: 0.618437
[34]     valid_0's binary_logloss: 0.617053
[35]     valid_0's binary_logloss: 0.615579
```

```
[36]    valid_0's binary_logloss: 0.613975
[37]    valid_0's binary_logloss: 0.612835
[38]    valid_0's binary_logloss: 0.611429
[39]    valid_0's binary_logloss: 0.609435
[40]    valid_0's binary_logloss: 0.608185
[41]    valid_0's binary_logloss: 0.605709
[42]    valid_0's binary_logloss: 0.604494
[43]    valid_0's binary_logloss: 0.603436
[44]    valid_0's binary_logloss: 0.602317
[45]    valid_0's binary_logloss: 0.600368
[46]    valid_0's binary_logloss: 0.599258
[47]    valid_0's binary_logloss: 0.597354
[48]    valid_0's binary_logloss: 0.596363
[49]    valid_0's binary_logloss: 0.59528
[50]    valid_0's binary_logloss: 0.593704
[51]    valid_0's binary_logloss: 0.592453
[52]    valid_0's binary_logloss: 0.591367
[53]    valid_0's binary_logloss: 0.589863
[54]    valid_0's binary_logloss: 0.588803
[55]    valid_0's binary_logloss: 0.586888
[56]    valid_0's binary_logloss: 0.585601
[57]    valid_0's binary_logloss: 0.584466
[58]    valid_0's binary_logloss: 0.583275
[59]    valid_0's binary_logloss: 0.582072
[60]    valid_0's binary_logloss: 0.580602
[61]    valid_0's binary_logloss: 0.579618
[62]    valid_0's binary_logloss: 0.578638
[63]    valid_0's binary_logloss: 0.577419
[64]    valid_0's binary_logloss: 0.57645
[65]    valid_0's binary_logloss: 0.575436
[66]    valid_0's binary_logloss: 0.574438
[67]    valid_0's binary_logloss: 0.573307
[68]    valid_0's binary_logloss: 0.571995
[69]    valid_0's binary_logloss: 0.570589
[70]    valid_0's binary_logloss: 0.569348
[71]    valid_0's binary_logloss: 0.568153
[72]    valid_0's binary_logloss: 0.567136
[73]    valid_0's binary_logloss: 0.566215
[74]    valid_0's binary_logloss: 0.564769
[75]    valid_0's binary_logloss: 0.563819
[76]    valid_0's binary_logloss: 0.562249
[77]    valid_0's binary_logloss: 0.561233
[78]    valid_0's binary_logloss: 0.559824
[79]    valid_0's binary_logloss: 0.558879
[80]    valid_0's binary_logloss: 0.557813
[81]    valid_0's binary_logloss: 0.556433
[82]    valid_0's binary_logloss: 0.555476
[83]    valid_0's binary_logloss: 0.55429
[84]    valid_0's binary_logloss: 0.55322
[85]    valid_0's binary_logloss: 0.552309
[86]    valid_0's binary_logloss: 0.551309
[87]    valid_0's binary_logloss: 0.550121
[88]    valid_0's binary_logloss: 0.548761
[89]    valid_0's binary_logloss: 0.547813
[90]    valid_0's binary_logloss: 0.546578
[91]    valid_0's binary_logloss: 0.545728
[92]    valid_0's binary_logloss: 0.544647
[93]    valid_0's binary_logloss: 0.543754
```

```
[94]     valid_0's binary_logloss: 0.542361
[95]     valid_0's binary_logloss: 0.541378
[96]     valid_0's binary_logloss: 0.540345
[97]     valid_0's binary_logloss: 0.539165
[98]     valid_0's binary_logloss: 0.538277
[99]     valid_0's binary_logloss: 0.537313
[100]    valid_0's binary_logloss: 0.536098
[101]    valid_0's binary_logloss: 0.535281
[102]    valid_0's binary_logloss: 0.534339
[103]    valid_0's binary_logloss: 0.532911
[104]    valid_0's binary_logloss: 0.531989
[105]    valid_0's binary_logloss: 0.531159
[106]    valid_0's binary_logloss: 0.530217
[107]    valid_0's binary_logloss: 0.528973
[108]    valid_0's binary_logloss: 0.527821
[109]    valid_0's binary_logloss: 0.526953
[110]    valid_0's binary_logloss: 0.525523
[111]    valid_0's binary_logloss: 0.524579
[112]    valid_0's binary_logloss: 0.52366
[113]    valid_0's binary_logloss: 0.522707
[114]    valid_0's binary_logloss: 0.521938
[115]    valid_0's binary_logloss: 0.520545
[116]    valid_0's binary_logloss: 0.519722
[117]    valid_0's binary_logloss: 0.518573
[118]    valid_0's binary_logloss: 0.517011
[119]    valid_0's binary_logloss: 0.516072
[120]    valid_0's binary_logloss: 0.515248
[121]    valid_0's binary_logloss: 0.514005
[122]    valid_0's binary_logloss: 0.513178
[123]    valid_0's binary_logloss: 0.512083
[124]    valid_0's binary_logloss: 0.511309
[125]    valid_0's binary_logloss: 0.510452
[126]    valid_0's binary_logloss: 0.50964
[127]    valid_0's binary_logloss: 0.508721
[128]    valid_0's binary_logloss: 0.507866
[129]    valid_0's binary_logloss: 0.506767
[130]    valid_0's binary_logloss: 0.505984
[131]    valid_0's binary_logloss: 0.505178
[132]    valid_0's binary_logloss: 0.50418
[133]    valid_0's binary_logloss: 0.503416
[134]    valid_0's binary_logloss: 0.502392
[135]    valid_0's binary_logloss: 0.501546
[136]    valid_0's binary_logloss: 0.500432
[137]    valid_0's binary_logloss: 0.499583
[138]    valid_0's binary_logloss: 0.498733
[139]    valid_0's binary_logloss: 0.497815
[140]    valid_0's binary_logloss: 0.496941
[141]    valid_0's binary_logloss: 0.496043
[142]    valid_0's binary_logloss: 0.495102
[143]    valid_0's binary_logloss: 0.493824
[144]    valid_0's binary_logloss: 0.493116
[145]    valid_0's binary_logloss: 0.492206
[146]    valid_0's binary_logloss: 0.491378
[147]    valid_0's binary_logloss: 0.490214
[148]    valid_0's binary_logloss: 0.488898
[149]    valid_0's binary_logloss: 0.488125
[150]    valid_0's binary_logloss: 0.487271
[151]    valid_0's binary_logloss: 0.486466
```

```
[152]    valid_0's binary_logloss: 0.485359
[153]    valid_0's binary_logloss: 0.484419
[154]    valid_0's binary_logloss: 0.483534
[155]    valid_0's binary_logloss: 0.482549
[156]    valid_0's binary_logloss: 0.48161
[157]    valid_0's binary_logloss: 0.480898
[158]    valid_0's binary_logloss: 0.479562
[159]    valid_0's binary_logloss: 0.478736
[160]    valid_0's binary_logloss: 0.477974
Did not meet early stopping. Best iteration is:
[160]    valid_0's binary_logloss: 0.477974
[1]      valid_0's binary_logloss: 0.686948
Training until validation scores don't improve for 5 rounds.
[2]      valid_0's binary_logloss: 0.682262
[3]      valid_0's binary_logloss: 0.678432
[4]      valid_0's binary_logloss: 0.675182
[5]      valid_0's binary_logloss: 0.672233
[6]      valid_0's binary_logloss: 0.669522
[7]      valid_0's binary_logloss: 0.667065
[8]      valid_0's binary_logloss: 0.664694
[9]      valid_0's binary_logloss: 0.662629
[10]     valid_0's binary_logloss: 0.660675
[11]     valid_0's binary_logloss: 0.658624
[12]     valid_0's binary_logloss: 0.656618
[13]     valid_0's binary_logloss: 0.65473
[14]     valid_0's binary_logloss: 0.652381
[15]     valid_0's binary_logloss: 0.65063
[16]     valid_0's binary_logloss: 0.648668
[17]     valid_0's binary_logloss: 0.646939
[18]     valid_0's binary_logloss: 0.645313
[19]     valid_0's binary_logloss: 0.642521
[20]     valid_0's binary_logloss: 0.641049
[21]     valid_0's binary_logloss: 0.639359
[22]     valid_0's binary_logloss: 0.637641
[23]     valid_0's binary_logloss: 0.635424
[24]     valid_0's binary_logloss: 0.633948
[25]     valid_0's binary_logloss: 0.631649
[26]     valid_0's binary_logloss: 0.630456
[27]     valid_0's binary_logloss: 0.629116
[28]     valid_0's binary_logloss: 0.627196
[29]     valid_0's binary_logloss: 0.626043
[30]     valid_0's binary_logloss: 0.623583
[31]     valid_0's binary_logloss: 0.622395
[32]     valid_0's binary_logloss: 0.621123
[33]     valid_0's binary_logloss: 0.619126
[34]     valid_0's binary_logloss: 0.618035
[35]     valid_0's binary_logloss: 0.616428
[36]     valid_0's binary_logloss: 0.615049
[37]     valid_0's binary_logloss: 0.612982
[38]     valid_0's binary_logloss: 0.611778
[39]     valid_0's binary_logloss: 0.610075
[40]     valid_0's binary_logloss: 0.609042
[41]     valid_0's binary_logloss: 0.607538
[42]     valid_0's binary_logloss: 0.606409
[43]     valid_0's binary_logloss: 0.604978
[44]     valid_0's binary_logloss: 0.603223
[45]     valid_0's binary_logloss: 0.60206
[46]     valid_0's binary_logloss: 0.60064
[47]     valid_0's binary_logloss: 0.599694
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[47]    valid_0's binary_logloss: 0.599604
[48]    valid_0's binary_logloss: 0.598551
[49]    valid_0's binary_logloss: 0.597173
[50]    valid_0's binary_logloss: 0.595032
[51]    valid_0's binary_logloss: 0.594032
[52]    valid_0's binary_logloss: 0.592048
[53]    valid_0's binary_logloss: 0.590906
[54]    valid_0's binary_logloss: 0.589409
[55]    valid_0's binary_logloss: 0.588277
[56]    valid_0's binary_logloss: 0.587249
[57]    valid_0's binary_logloss: 0.585287
[58]    valid_0's binary_logloss: 0.584318
[59]    valid_0's binary_logloss: 0.583319
[60]    valid_0's binary_logloss: 0.582308
[61]    valid_0's binary_logloss: 0.581024
[62]    valid_0's binary_logloss: 0.579751
[63]    valid_0's binary_logloss: 0.578597
[64]    valid_0's binary_logloss: 0.577405
[65]    valid_0's binary_logloss: 0.576237
[66]    valid_0's binary_logloss: 0.574815
[67]    valid_0's binary_logloss: 0.573863
[68]    valid_0's binary_logloss: 0.572494
[69]    valid_0's binary_logloss: 0.571451
[70]    valid_0's binary_logloss: 0.570026
[71]    valid_0's binary_logloss: 0.568383
[72]    valid_0's binary_logloss: 0.567448
[73]    valid_0's binary_logloss: 0.566482
[74]    valid_0's binary_logloss: 0.565181
[75]    valid_0's binary_logloss: 0.563815
[76]    valid_0's binary_logloss: 0.562879
[77]    valid_0's binary_logloss: 0.561576
[78]    valid_0's binary_logloss: 0.560622
[79]    valid_0's binary_logloss: 0.559641
[80]    valid_0's binary_logloss: 0.558485
[81]    valid_0's binary_logloss: 0.557567
[82]    valid_0's binary_logloss: 0.556379
[83]    valid_0's binary_logloss: 0.554848
[84]    valid_0's binary_logloss: 0.553933
[85]    valid_0's binary_logloss: 0.552972
[86]    valid_0's binary_logloss: 0.551972
[87]    valid_0's binary_logloss: 0.550906
[88]    valid_0's binary_logloss: 0.549887
[89]    valid_0's binary_logloss: 0.548924
[90]    valid_0's binary_logloss: 0.548028
[91]    valid_0's binary_logloss: 0.54708
[92]    valid_0's binary_logloss: 0.545532
[93]    valid_0's binary_logloss: 0.544663
[94]    valid_0's binary_logloss: 0.543295
[95]    valid_0's binary_logloss: 0.542357
[96]    valid_0's binary_logloss: 0.541485
[97]    valid_0's binary_logloss: 0.540601
[98]    valid_0's binary_logloss: 0.539662
[99]    valid_0's binary_logloss: 0.538813
[100]   valid_0's binary_logloss: 0.53759
[101]   valid_0's binary_logloss: 0.536669
[102]   valid_0's binary_logloss: 0.535274
[103]   valid_0's binary_logloss: 0.534378
[104]   valid_0's binary_logloss: 0.533367
[105]   valid_0's binary_logloss: 0.532542
```

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[106]    valid_0's binary_logloss: 0.531236
[107]    valid_0's binary_logloss: 0.530328
[108]    valid_0's binary_logloss: 0.529157
[109]    valid_0's binary_logloss: 0.528204
[110]    valid_0's binary_logloss: 0.527277
[111]    valid_0's binary_logloss: 0.526302
[112]    valid_0's binary_logloss: 0.524977
[113]    valid_0's binary_logloss: 0.524142
[114]    valid_0's binary_logloss: 0.522923
[115]    valid_0's binary_logloss: 0.522024
[116]    valid_0's binary_logloss: 0.521145
[117]    valid_0's binary_logloss: 0.520342
[118]    valid_0's binary_logloss: 0.519153
[119]    valid_0's binary_logloss: 0.517957
[120]    valid_0's binary_logloss: 0.51713
[121]    valid_0's binary_logloss: 0.516087
[122]    valid_0's binary_logloss: 0.515131
[123]    valid_0's binary_logloss: 0.514342
[124]    valid_0's binary_logloss: 0.513361
[125]    valid_0's binary_logloss: 0.512512
[126]    valid_0's binary_logloss: 0.511261
[127]    valid_0's binary_logloss: 0.510395
[128]    valid_0's binary_logloss: 0.509352
[129]    valid_0's binary_logloss: 0.508421
[130]    valid_0's binary_logloss: 0.507533
[131]    valid_0's binary_logloss: 0.506588
[132]    valid_0's binary_logloss: 0.505384
[133]    valid_0's binary_logloss: 0.50456
[134]    valid_0's binary_logloss: 0.503492
[135]    valid_0's binary_logloss: 0.501974
[136]    valid_0's binary_logloss: 0.501093
[137]    valid_0's binary_logloss: 0.500332
[138]    valid_0's binary_logloss: 0.499392
[139]    valid_0's binary_logloss: 0.498391
[140]    valid_0's binary_logloss: 0.497541
[141]    valid_0's binary_logloss: 0.496625
[142]    valid_0's binary_logloss: 0.495731
[143]    valid_0's binary_logloss: 0.494853
[144]    valid_0's binary_logloss: 0.493909
[145]    valid_0's binary_logloss: 0.493079
[146]    valid_0's binary_logloss: 0.49232
[147]    valid_0's binary_logloss: 0.491483
[148]    valid_0's binary_logloss: 0.490678
[149]    valid_0's binary_logloss: 0.489992
[150]    valid_0's binary_logloss: 0.488743
Did not meet early stopping. Best iteration is:
[150]    valid_0's binary_logloss: 0.488743
[1]      valid_0's binary_logloss: 0.686881
Training until validation scores don't improve for 5 rounds.
[2]      valid_0's binary_logloss: 0.682115
[3]      valid_0's binary_logloss: 0.67825
[4]      valid_0's binary_logloss: 0.674983
[5]      valid_0's binary_logloss: 0.671995
[6]      valid_0's binary_logloss: 0.669282
[7]      valid_0's binary_logloss: 0.666739
[8]      valid_0's binary_logloss: 0.664414
[9]      valid_0's binary_logloss: 0.662213
[10]     valid_0's binary_logloss: 0.659859
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[11]     valid_0's binary_logloss: 0.657688
[12]     valid_0's binary_logloss: 0.655521
[13]     valid_0's binary_logloss: 0.653598
[14]     valid_0's binary_logloss: 0.651595
[15]     valid_0's binary_logloss: 0.649396
[16]     valid_0's binary_logloss: 0.646859
[17]     valid_0's binary_logloss: 0.645035
[18]     valid_0's binary_logloss: 0.643285
[19]     valid_0's binary_logloss: 0.641587
[20]     valid_0's binary_logloss: 0.640031
[21]     valid_0's binary_logloss: 0.638267
[22]     valid_0's binary_logloss: 0.63618
[23]     valid_0's binary_logloss: 0.633895
[24]     valid_0's binary_logloss: 0.632346
[25]     valid_0's binary_logloss: 0.630868
[26]     valid_0's binary_logloss: 0.629458
[27]     valid_0's binary_logloss: 0.627072
[28]     valid_0's binary_logloss: 0.625593
[29]     valid_0's binary_logloss: 0.62383
[30]     valid_0's binary_logloss: 0.62267
[31]     valid_0's binary_logloss: 0.620879
[32]     valid_0's binary_logloss: 0.618492
[33]     valid_0's binary_logloss: 0.61712
[34]     valid_0's binary_logloss: 0.615919
[35]     valid_0's binary_logloss: 0.614254
[36]     valid_0's binary_logloss: 0.612953
[37]     valid_0's binary_logloss: 0.611061
[38]     valid_0's binary_logloss: 0.609925
[39]     valid_0's binary_logloss: 0.608306
[40]     valid_0's binary_logloss: 0.606705
[41]     valid_0's binary_logloss: 0.604775
[42]     valid_0's binary_logloss: 0.603592
[43]     valid_0's binary_logloss: 0.602116
[44]     valid_0's binary_logloss: 0.600907
[45]     valid_0's binary_logloss: 0.59952
[46]     valid_0's binary_logloss: 0.598315
[47]     valid_0's binary_logloss: 0.597236
[48]     valid_0's binary_logloss: 0.595225
[49]     valid_0's binary_logloss: 0.594173
[50]     valid_0's binary_logloss: 0.592737
[51]     valid_0's binary_logloss: 0.591693
[52]     valid_0's binary_logloss: 0.590455
[53]     valid_0's binary_logloss: 0.589155
[54]     valid_0's binary_logloss: 0.587245
[55]     valid_0's binary_logloss: 0.586042
[56]     valid_0's binary_logloss: 0.584853
[57]     valid_0's binary_logloss: 0.583686
[58]     valid_0's binary_logloss: 0.582116
[59]     valid_0's binary_logloss: 0.580519
[60]     valid_0's binary_logloss: 0.57932
[61]     valid_0's binary_logloss: 0.577863
[62]     valid_0's binary_logloss: 0.576815
[63]     valid_0's binary_logloss: 0.575701
[64]     valid_0's binary_logloss: 0.574622
[65]     valid_0's binary_logloss: 0.572695
[66]     valid_0's binary_logloss: 0.571697
[67]     valid_0's binary_logloss: 0.570611
[68]     valid_0's binary_logloss: 0.569579
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[69]    valid_0's binary_logloss: 0.568435
[70]    valid_0's binary_logloss: 0.566905
[71]    valid_0's binary_logloss: 0.565263
[72]    valid_0's binary_logloss: 0.564325
[73]    valid_0's binary_logloss: 0.562739
[74]    valid_0's binary_logloss: 0.561553
[75]    valid_0's binary_logloss: 0.560602
[76]    valid_0's binary_logloss: 0.559539
[77]    valid_0's binary_logloss: 0.558137
[78]    valid_0's binary_logloss: 0.557015
[79]    valid_0's binary_logloss: 0.555559
[80]    valid_0's binary_logloss: 0.554501
[81]    valid_0's binary_logloss: 0.553126
[82]    valid_0's binary_logloss: 0.552124
[83]    valid_0's binary_logloss: 0.551153
[84]    valid_0's binary_logloss: 0.549875
[85]    valid_0's binary_logloss: 0.548908
[86]    valid_0's binary_logloss: 0.547309
[87]    valid_0's binary_logloss: 0.546349
[88]    valid_0's binary_logloss: 0.544869
[89]    valid_0's binary_logloss: 0.543925
[90]    valid_0's binary_logloss: 0.542795
[91]    valid_0's binary_logloss: 0.541694
[92]    valid_0's binary_logloss: 0.54074
[93]    valid_0's binary_logloss: 0.539778
[94]    valid_0's binary_logloss: 0.538817
[95]    valid_0's binary_logloss: 0.537407
[96]    valid_0's binary_logloss: 0.536501
[97]    valid_0's binary_logloss: 0.535577
[98]    valid_0's binary_logloss: 0.534333
[99]    valid_0's binary_logloss: 0.532953
[100]   valid_0's binary_logloss: 0.532087
[101]   valid_0's binary_logloss: 0.530981
[102]   valid_0's binary_logloss: 0.530037
[103]   valid_0's binary_logloss: 0.529146
[104]   valid_0's binary_logloss: 0.528255
[105]   valid_0's binary_logloss: 0.52708
[106]   valid_0's binary_logloss: 0.52619
[107]   valid_0's binary_logloss: 0.525275
[108]   valid_0's binary_logloss: 0.524319
[109]   valid_0's binary_logloss: 0.522877
[110]   valid_0's binary_logloss: 0.521978
[111]   valid_0's binary_logloss: 0.521108
[112]   valid_0's binary_logloss: 0.519862
[113]   valid_0's binary_logloss: 0.518894
[114]   valid_0's binary_logloss: 0.517985
[115]   valid_0's binary_logloss: 0.517102
[116]   valid_0's binary_logloss: 0.515704
[117]   valid_0's binary_logloss: 0.514796
[118]   valid_0's binary_logloss: 0.51396
[119]   valid_0's binary_logloss: 0.512717
[120]   valid_0's binary_logloss: 0.511876
[121]   valid_0's binary_logloss: 0.511057
[122]   valid_0's binary_logloss: 0.510118
[123]   valid_0's binary_logloss: 0.509113
[124]   valid_0's binary_logloss: 0.508031
[125]   valid_0's binary_logloss: 0.507175
[126]   valid_0's binary_logloss: 0.505865
[127]   valid_0's binary_logloss: 0.504447
```

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[127]    valid_0's binary_logloss: 0.504447
[128]    valid_0's binary_logloss: 0.503404
[129]    valid_0's binary_logloss: 0.50253
[130]    valid_0's binary_logloss: 0.501475
[131]    valid_0's binary_logloss: 0.500658
[132]    valid_0's binary_logloss: 0.499682
[133]    valid_0's binary_logloss: 0.49882
[134]    valid_0's binary_logloss: 0.497654
[135]    valid_0's binary_logloss: 0.496862
[136]    valid_0's binary_logloss: 0.495774
[137]    valid_0's binary_logloss: 0.494958
[138]    valid_0's binary_logloss: 0.493963
[139]    valid_0's binary_logloss: 0.493184
[140]    valid_0's binary_logloss: 0.492305
Did not meet early stopping. Best iteration is:
[140]    valid_0's binary_logloss: 0.492305
[1]      valid_0's binary_logloss: 0.686844
Training until validation scores don't improve for 10 rounds.
[2]      valid_0's binary_logloss: 0.682049
[3]      valid_0's binary_logloss: 0.678115
[4]      valid_0's binary_logloss: 0.674776
[5]      valid_0's binary_logloss: 0.671768
[6]      valid_0's binary_logloss: 0.668917
[7]      valid_0's binary_logloss: 0.666374
[8]      valid_0's binary_logloss: 0.664034
[9]      valid_0's binary_logloss: 0.661781
[10]     valid_0's binary_logloss: 0.659596
[11]     valid_0's binary_logloss: 0.657499
[12]     valid_0's binary_logloss: 0.65543
[13]     valid_0's binary_logloss: 0.653094
[14]     valid_0's binary_logloss: 0.650673
[15]     valid_0's binary_logloss: 0.648692
[16]     valid_0's binary_logloss: 0.646705
[17]     valid_0's binary_logloss: 0.644533
[18]     valid_0's binary_logloss: 0.642866
[19]     valid_0's binary_logloss: 0.640945
[20]     valid_0's binary_logloss: 0.639063
[21]     valid_0's binary_logloss: 0.637441
[22]     valid_0's binary_logloss: 0.635693
[23]     valid_0's binary_logloss: 0.633813
[24]     valid_0's binary_logloss: 0.632276
[25]     valid_0's binary_logloss: 0.629629
[26]     valid_0's binary_logloss: 0.628041
[27]     valid_0's binary_logloss: 0.625572
[28]     valid_0's binary_logloss: 0.624301
[29]     valid_0's binary_logloss: 0.622952
[30]     valid_0's binary_logloss: 0.62092
[31]     valid_0's binary_logloss: 0.619411
[32]     valid_0's binary_logloss: 0.618263
[33]     valid_0's binary_logloss: 0.616779
[34]     valid_0's binary_logloss: 0.61529
[35]     valid_0's binary_logloss: 0.612836
[36]     valid_0's binary_logloss: 0.611559
[37]     valid_0's binary_logloss: 0.610439
[38]     valid_0's binary_logloss: 0.608734
[39]     valid_0's binary_logloss: 0.607572
[40]     valid_0's binary_logloss: 0.606299
[41]     valid_0's binary_logloss: 0.60489
[42]     valid_0's binary_logloss: 0.603518
```

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[42]     valid_0's binary_logloss: 0.603518
[43]     valid_0's binary_logloss: 0.601922
[44]     valid_0's binary_logloss: 0.600716
[45]     valid_0's binary_logloss: 0.599464
[46]     valid_0's binary_logloss: 0.598229
[47]     valid_0's binary_logloss: 0.596967
[48]     valid_0's binary_logloss: 0.595548
[49]     valid_0's binary_logloss: 0.593551
[50]     valid_0's binary_logloss: 0.591906
[51]     valid_0's binary_logloss: 0.590791
[52]     valid_0's binary_logloss: 0.5897
[53]     valid_0's binary_logloss: 0.58849
[54]     valid_0's binary_logloss: 0.587148
[55]     valid_0's binary_logloss: 0.58612
[56]     valid_0's binary_logloss: 0.584447
[57]     valid_0's binary_logloss: 0.583152
[58]     valid_0's binary_logloss: 0.582049
[59]     valid_0's binary_logloss: 0.58063
[60]     valid_0's binary_logloss: 0.579594
[61]     valid_0's binary_logloss: 0.577681
[62]     valid_0's binary_logloss: 0.57627
[63]     valid_0's binary_logloss: 0.575211
[64]     valid_0's binary_logloss: 0.574009
[65]     valid_0's binary_logloss: 0.573012
[66]     valid_0's binary_logloss: 0.571783
[67]     valid_0's binary_logloss: 0.570811
[68]     valid_0's binary_logloss: 0.568983
[69]     valid_0's binary_logloss: 0.567916
[70]     valid_0's binary_logloss: 0.566896
[71]     valid_0's binary_logloss: 0.565657
[72]     valid_0's binary_logloss: 0.564213
[73]     valid_0's binary_logloss: 0.562566
[74]     valid_0's binary_logloss: 0.561345
[75]     valid_0's binary_logloss: 0.560297
[76]     valid_0's binary_logloss: 0.558386
[77]     valid_0's binary_logloss: 0.557359
[78]     valid_0's binary_logloss: 0.556295
[79]     valid_0's binary_logloss: 0.555188
[80]     valid_0's binary_logloss: 0.554296
[81]     valid_0's binary_logloss: 0.552901
[82]     valid_0's binary_logloss: 0.551792
[83]     valid_0's binary_logloss: 0.550833
[84]     valid_0's binary_logloss: 0.54988
[85]     valid_0's binary_logloss: 0.548356
[86]     valid_0's binary_logloss: 0.547277
[87]     valid_0's binary_logloss: 0.546089
[88]     valid_0's binary_logloss: 0.545068
[89]     valid_0's binary_logloss: 0.543655
[90]     valid_0's binary_logloss: 0.542704
[91]     valid_0's binary_logloss: 0.541717
[92]     valid_0's binary_logloss: 0.54057
[93]     valid_0's binary_logloss: 0.539676
[94]     valid_0's binary_logloss: 0.538537
[95]     valid_0's binary_logloss: 0.537597
[96]     valid_0's binary_logloss: 0.536628
[97]     valid_0's binary_logloss: 0.535206
[98]     valid_0's binary_logloss: 0.533804
[99]     valid_0's binary_logloss: 0.532952
[100]    valid_0's binary_logloss: 0.531759
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[101]    valid_0's binary_logloss: 0.53071
[102]    valid_0's binary_logloss: 0.529421
[103]    valid_0's binary_logloss: 0.528525
[104]    valid_0's binary_logloss: 0.527395
[105]    valid_0's binary_logloss: 0.526447
[106]    valid_0's binary_logloss: 0.524894
[107]    valid_0's binary_logloss: 0.523862
[108]    valid_0's binary_logloss: 0.522877
[109]    valid_0's binary_logloss: 0.52196
[110]    valid_0's binary_logloss: 0.520321
[111]    valid_0's binary_logloss: 0.519445
[112]    valid_0's binary_logloss: 0.518061
[113]    valid_0's binary_logloss: 0.517205
[114]    valid_0's binary_logloss: 0.516326
[115]    valid_0's binary_logloss: 0.514985
[116]    valid_0's binary_logloss: 0.514137
[117]    valid_0's binary_logloss: 0.513289
[118]    valid_0's binary_logloss: 0.512117
[119]    valid_0's binary_logloss: 0.510807
[120]    valid_0's binary_logloss: 0.509932
[121]    valid_0's binary_logloss: 0.509028
[122]    valid_0's binary_logloss: 0.50814
[123]    valid_0's binary_logloss: 0.507141
[124]    valid_0's binary_logloss: 0.506284
[125]    valid_0's binary_logloss: 0.505243
[126]    valid_0's binary_logloss: 0.504068
[127]    valid_0's binary_logloss: 0.503173
[128]    valid_0's binary_logloss: 0.502343
[129]    valid_0's binary_logloss: 0.501017
[130]    valid_0's binary_logloss: 0.500096
[131]    valid_0's binary_logloss: 0.498931
[132]    valid_0's binary_logloss: 0.4981
[133]    valid_0's binary_logloss: 0.497259
[134]    valid_0's binary_logloss: 0.495953
[135]    valid_0's binary_logloss: 0.494865
[136]    valid_0's binary_logloss: 0.494059
[137]    valid_0's binary_logloss: 0.493159
[138]    valid_0's binary_logloss: 0.492337
[139]    valid_0's binary_logloss: 0.491029
[140]    valid_0's binary_logloss: 0.490191
[141]    valid_0's binary_logloss: 0.489388
[142]    valid_0's binary_logloss: 0.488305
[143]    valid_0's binary_logloss: 0.487507
[144]    valid_0's binary_logloss: 0.486637
[145]    valid_0's binary_logloss: 0.485793
[146]    valid_0's binary_logloss: 0.484818
[147]    valid_0's binary_logloss: 0.484043
[148]    valid_0's binary_logloss: 0.482929
[149]    valid_0's binary_logloss: 0.482128
[150]    valid_0's binary_logloss: 0.481161
[151]    valid_0's binary_logloss: 0.480413
[152]    valid_0's binary_logloss: 0.479427
Did not meet early stopping. Best iteration is:
[152]    valid_0's binary_logloss: 0.479427
```

In [15]:
```
#实现零均值归一化操作
confidence_test = (gbm_1.predict(X_test) + gbm_2.predict(X_test)+gb
```

```
confidence_test = (gbm_1.predict(X_test) + gbm_2.predict(X_test)+gb
m_3.predict(X_test)+gbm_4.predict(X_test)+gbm_5.predict(X_test)+gbm
_6.predict(X_test))/6
confidence_test = (confidence_test-confidence_test.min())/(confiden
ce_test.max()-confidence_test.min())
#print("max_min",max_min)
#confidence_test=(confidence_test-confidence_test.mean())/(confidence
_test.std())
confidence_test = confidence_test*2-1
print(max(confidence_test),min(confidence_test))

# calculation of actual metric that is used to calculate final score
r_test = r_test.clip(-1,1) # get rid of outliers. Where do they come
 from??
x_t_i = confidence_test * r_test * u_test
data = {'day' : d_test, 'x_t_i' : x_t_i}
df = pd.DataFrame(data)
x_t = df.groupby('day').sum().values.flatten()
mean = np.mean(x_t)
std = np.std(x_t)
score_test = mean / std
print(score_test)
```

```
1.0 -1.0
2.8167943588297066
```

In [16]:
```
import gc
del X_train,X_test
gc.collect()
```

Out[16]:
```
100
```

In [17]:
```
#prediction
days = env.get_prediction_days()
n_days = 0
prep_time = 0
prediction_time = 0
packaging_time = 0
total_market_obs_df = []
for (market_obs_df, news_obs_df, predictions_template_df) in days:
    n_days +=1
    if (n_days%50==0):
        pass
        #print(n_days,end=' ')
    t = time.time()
    market_obs_df['time'] = market_obs_df['time'].dt.date

    return_features = ['returnsClosePrevMktres10','returnsClosePrev
Raw10','open','close']
    total_market_obs_df.append(market_obs_df)
    if len(total_market_obs_df)==1:
        history_df = total_market_obs_df[0]
    else:
        history_df = pd.concat(total_market_obs_df[-(np.max(n_lag)+
1):])
```

```
•).1)
    new_df = generate_lag_features(history_df,n_lag=[3,7,14])
    market_obs_df = pd.merge(market_obs_df,new_df,how='left',on=['t
ime','assetCode'])
    market_obs_df = mis_impute(market_obs_df)
    market_obs_df = data_prep(market_obs_df)

    X_live = market_obs_df[fcol].values
    X_live = 1 - ((maxs - X_live) / rng)
    prep_time += time.time() - t
    t = time.time()
    lp = (gbm_1.predict(X_live) + gbm_2.predict(X_live)+gbm_3.predi
ct(X_live)+gbm_4.predict(X_live)+gbm_5.predict(X_live)+gbm_6.predic
t(X_live))/6
    prediction_time += time.time() -t
    t = time.time()
    confidence = lp
    confidence = (confidence-confidence.min())/(confidence.max()-co
nfidence.min())
    #print("max_min_predict",max_min_predict)
    confidence = confidence * 2 - 1
    preds = pd.DataFrame({'assetCode':market_obs_df['assetCode'],'c
onfidence':confidence})
    predictions_template_df = predictions_template_df.merge(preds,h
ow='left').drop('confidenceValue',axis=1).fillna(0).rename(columns=
{'confidence':'confidenceValue'})
    env.predict(predictions_template_df)
    packaging_time += time.time() - t

env.write_submission_file()
sub  = pd.read_csv("submission_versionnew.csv")
```

```
['A.N' 'AA.N' 'AAL.O' ... 'ZNGA.O' 'ZTO.N' 'ZTS.N']
total 1823 df
['A.N' 'AA.N' 'AAL.O' ... 'COUP.O' 'HK.N' 'TSRA.O']
total 1826 df
['A.N' 'AA.N' 'AAL.O' ... 'HK.N' 'TSRA.O' 'SOHU.O']
total 1827 df
['A.N' 'AA.N' 'AAL.O' ... 'ATKR.N' 'ECPG.O' 'UAA.N']
total 1830 df
['A.N' 'AA.N' 'AAL.O' ... 'UAA.N' 'ALJ.N' 'HEES.O']
total 1832 df
['A.N' 'AA.N' 'AAL.O' ... 'CODI.N' 'DORM.O' 'OTEX.O']
total 1835 df
['A.N' 'AA.N' 'AAL.O' ... 'OCFC.O' 'THRM.O' 'TVTY.O']
total 1841 df
['A.N' 'AA.N' 'AAL.O' ... 'CLDT.N' 'ERI.O' 'OMAM.N']
total 1844 df
['A.N' 'AA.N' 'AAL.O' ... 'OMAM.N' 'CRC.N' 'WGO.N']
total 1846 df
['A.N' 'AA.N' 'AAL.O' ... 'HNI.N' 'SFBS.O' 'WMS.N']
total 1851 df
['A.N' 'AA.N' 'AAL.O' ... 'ATW.N' 'FDS.N' 'PKX.N']
total 1854 df
['A.N' 'AA.N' 'AAL.O' ... 'FDS.N' 'PKX.N' 'AXON.N']
total 1855 df
['A.N' 'AA.N' 'AAL.O' ... 'PKX.N' 'AXON.N' 'MITL.O']
total 1856 df
```

```
['A.N' 'AA.N' 'AAL.O' ... 'AXON.N' 'MITL.O' 'DCP.N']
total 1857 df
['A.N' 'AA.N' 'AAL.O' ... 'AHT.N' 'SHLM.O' 'VRTU.O']
total 1860 df
['A.N' 'AA.N' 'AAL.O' ... 'SHLM.O' 'VRTU.O' 'NTRI.O']
total 1858 df
['A.N' 'AA.N' 'AAL.O' ... 'SHLM.O' 'VRTU.O' 'NTRI.O']
total 1852 df
['A.N' 'AA.N' 'AAL.O' ... 'VRTU.O' 'NTRI.O' 'LGFa.N']
total 1853 df
['A.N' 'AA.N' 'AAL.O' ... 'NTRI.O' 'LGFa.N' 'LTC.N']
total 1853 df
['A.N' 'AA.N' 'AAL.O' ... 'GPT.N' 'HBM.N' 'SRG.N']
total 1852 df
['A.N' 'AA.N' 'AAL.O' ... 'REN.N' 'RH.N' 'TWNK.O']
total 1856 df
['A.N' 'AA.N' 'AAL.O' ... 'CMP.N' 'HLT.N' 'WTW.N']
total 1856 df
['A.N' 'AA.N' 'AAL.O' ... 'AWI.N' 'CHT.N' 'RLI.N']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'CLS.N' 'HGV.N' 'PK.N']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'PK.N' 'OR.N' 'VLRS.N']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'ABAX.O' 'LOXO.O' 'WIX.O']
total 1862 df
['A.N' 'AA.N' 'AAL.O' ... 'LOXO.O' 'WIX.O' 'TK.N']
total 1853 df
['A.N' 'AA.N' 'AAL.O' ... 'HOLI.O' 'MC.N' 'MIME.O']
total 1855 df
['A.N' 'AA.N' 'AAL.O' ... 'TECH.O' 'THG.N' 'VRNS.O']
total 1861 df
['A.N' 'AA.N' 'AAL.O' ... 'NMBL.N' 'TDOC.N' 'TGS.N']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'FWONK.O' 'PLXS.O' 'SAIA.O']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'GTN.N' 'UVV.N' 'VC.N']
total 1864 df
['A.N' 'AA.N' 'AAL.O' ... 'INSY.O' 'MMYT.O' 'NICE.O']
total 1867 df
['A.N' 'AA.N' 'AAL.O' ... 'NICE.O' 'EPAY.O' 'MPSX.N']
total 1869 df
['A.N' 'AA.N' 'AAL.O' ... 'NICE.O' 'EPAY.O' 'MPSX.N']
total 1867 df
['A.N' 'AA.N' 'AAL.O' ... 'QGEN.O' 'SN.N' 'XPER.O']
total 1869 df
['A.N' 'AA.N' 'AAL.O' ... 'GGP.N' 'PRIM.O' 'WSTC.O']
total 1867 df
['A.N' 'AA.N' 'AAL.O' ... 'EEQ.N' 'MTH.N' 'NFBK.O']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'AFG.N' 'CPA.N' 'PCH.O']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'CPA.N' 'PCH.O' 'LRN.N']
total 1864 df
['A.N' 'AA.N' 'AAL.O' ... 'PCH.O' 'LRN.N' 'CBM.N']
total 1857 df
['A.N' 'AA.N' 'AAL.O' ... 'CBM.N' 'AVAL.N' 'SATS.O']
total 1856 df
['A.N' 'AA.N' 'AAL.O' ... 'QUOT.N' 'SPCT.A' 'WRT.N']
```

```
[ A.N    AA.N    AAL.O  ...   QUOT.N   SRC1.A   WBT.N ]
total 1861 df
['A.N' 'AA.N' 'AAL.O' ... 'WBT.N' 'BIVV.O' 'RGR.N']
total 1860 df
['A.N' 'AA.N' 'AAL.O' ... 'BCO.N' 'GMLP.O' 'SSD.N']
total 1860 df
['A.N' 'AA.N' 'AAL.O' ... 'SSD.N' 'DNB.N' 'WEX.N']
total 1853 df
['A.N' 'AA.N' 'AAL.O' ... 'WEX.N' 'FRAC.N' 'TTS.O']
total 1855 df
['A.N' 'AA.N' 'AAL.O' ... 'TTS.O' 'DGI.N' 'TMST.N']
total 1856 df
['A.N' 'AA.N' 'AAL.O' ... 'TTS.O' 'DGI.N' 'TMST.N']
total 1851 df
['A.N' 'AA.N' 'AAL.O' ... 'TMST.N' 'CLDT.N' 'DDC.N']
total 1846 df
['A.N' 'AA.N' 'AAL.O' ... 'POOL.O' 'RUSHA.O' 'VREX.O']
total 1845 df
['A.N' 'AA.N' 'AAL.O' ... 'DIN.N' 'JAG.N' 'JELD.N']
total 1846 df
['A.N' 'AA.N' 'AAL.O' ... 'EDIT.O' 'GBT.O' 'RHP.N']
total 1850 df
['A.N' 'AA.N' 'AAL.O' ... 'MATX.N' 'NHI.N' 'QUAD.N']
total 1853 df
['A.N' 'AA.N' 'AAL.O' ... 'GMS.N' 'PRTY.N' 'TMHC.N']
total 1850 df
['A.N' 'AA.N' 'AAL.O' ... 'TMHC.N' 'PEGA.O' 'TELL.O']
total 1847 df
['A.N' 'AA.N' 'AAL.O' ... 'SUI.N' 'SWIR.O' 'UNIT.O']
total 1852 df
['A.N' 'AA.N' 'AAL.O' ... 'HRTX.O' 'LIVN.O' 'SPTN.O']
total 1855 df
['A.N' 'AA.N' 'AAL.O' ... 'AEGN.O' 'DERM.O' 'ITRI.O']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'ITRI.O' 'GNL.N' 'TGP.N']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'ERI.O' 'GBDC.O' 'SSL.N']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'SSL.N' 'BZUN.O' 'WRD.N']
total 1862 df
['A.N' 'AA.N' 'AAL.O' ... 'BZUN.O' 'WRD.N' 'COTV.N']
total 1862 df
['A.N' 'AA.N' 'AAL.O' ... 'FOXF.O' 'JBT.N' 'MANT.O']
total 1864 df
['A.N' 'AA.N' 'AAL.O' ... 'MANT.O' 'MLI.N' 'NGVT.N']
total 1862 df
['A.N' 'AA.N' 'AAL.O' ... 'MLCO.O' 'RMP.N' 'SWX.N']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'ALRM.O' 'EXTN.N' 'NCS.N']
total 1866 df
['A.N' 'AA.N' 'AAL.O' ... 'BEAT.O' 'COUP.O' 'WGO.N']
total 1867 df
['A.N' 'AA.N' 'AAL.O' ... 'WGO.N' 'ARCO.N' 'GHL.N']
total 1866 df
['A.N' 'AA.N' 'AAL.O' ... 'BNCL.O' 'PTHN.N' 'SITE.N']
total 1865 df
['A.N' 'AA.N' 'AAL.O' ... 'IBOC.O' 'NGHC.O' 'TRST.O']
total 1871 df
['A.N' 'AA.N' 'AAL.O' ... 'MGI.O' 'SBY.N' 'TFSL.O']
```

```
total 1873 df
['A.N' 'AA.N' 'AAL.O' ... 'LFC.N' 'MIME.O' 'STNG.N']
total 1875 df
['A.N' 'AA.N' 'AAL.O' ... 'STNG.N' 'DEA.N' 'LKSD.N']
total 1876 df
['A.N' 'AA.N' 'AAL.O' ... 'HI.N' 'RACE.N' 'SNAP.N']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'HUBG.O' 'NANO.O' 'YIN.O']
total 1872 df
['A.N' 'AA.N' 'AAL.O' ... 'HMST.O' 'TECH.O' 'TOO.N']
total 1875 df
['A.N' 'AA.N' 'AAL.O' ... 'BIP.N' 'FDS.N' 'NTNX.O']
total 1878 df
['A.N' 'AA.N' 'AAL.O' ... 'FDS.N' 'NTNX.O' 'QIWI.O']
total 1876 df
['A.N' 'AA.N' 'AAL.O' ... 'NMFC.N' 'PPBI.O' 'TRNO.N']
total 1873 df
['A.N' 'AA.N' 'AAL.O' ... 'PPBI.O' 'TRNO.N' 'CACC.O']
total 1872 df
['A.N' 'AA.N' 'AAL.O' ... 'BABY.O' 'GPI.N' 'VEON.O']
total 1875 df
['A.N' 'AA.N' 'AAL.O' ... 'ABG.N' 'DXC.N' 'EXTR.O']
total 1873 df
['A.N' 'AA.N' 'AAL.O' ... 'EXTR.O' 'BCOR.O' 'DIOD.O']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'BCOR.O' 'DIOD.O' 'GOOS.N']
total 1869 df
['A.N' 'AA.N' 'AAL.O' ... 'GOOS.N' 'NVCR.O' 'PUMP.N']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'THG.N' 'WSO.N' 'WSTC.O']
total 1878 df
['A.N' 'AA.N' 'AAL.O' ... 'THG.N' 'WSO.N' 'WSTC.O']
total 1872 df
['A.N' 'AA.N' 'AAL.O' ... 'WSTC.O' 'APOG.O' 'NS.N']
total 1874 df
['A.N' 'AA.N' 'AAL.O' ... 'APOG.O' 'NS.N' 'RNR.N']
total 1866 df
['A.N' 'AA.N' 'AAL.O' ... 'OSUR.O' 'PLAB.O' 'TLK.N']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'PLAB.O' 'TLK.N' 'SNOW.N']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'TLK.N' 'SNOW.N' 'RCI.N']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'DEO.N' 'MGP.N' 'TCPC.O']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'MGP.N' 'TCPC.O' 'E.N']
total 1866 df
['A.N' 'AA.N' 'AAL.O' ... 'MZOR.O' 'SOHU.O' 'SPNC.O']
total 1872 df
['A.N' 'AA.N' 'AAL.O' ... 'NGL.N' 'RE.N' 'VREX.O']
total 1878 df
['A.N' 'AA.N' 'AAL.O' ... 'NGL.N' 'RE.N' 'VREX.O']
total 1871 df
['A.N' 'AA.N' 'AAL.O' ... 'SNDR.N' 'TLLP.N' 'TREE.O']
total 1875 df
['A.N' 'AA.N' 'AAL.O' ... 'TLLP.N' 'TREE.O' 'NVRO.N']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'NVRO.N' 'AMG.N' 'AXDX.O']
```

```
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'LTM.N' 'MCRN.N' 'SHLX.N']
total 1871 df
['A.N' 'AA.N' 'AAL.O' ... 'SHLX.N' 'AB.N' 'NCI.N']
total 1869 df
['A.N' 'AA.N' 'AAL.O' ... 'MMYT.O' 'TKC.N' 'UPL.O']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'ROCK.O' 'SWIR.O' 'VRNS.O']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'GWPH.O' 'KAMN.N' 'PI.O']
total 1873 df
['A.N' 'AA.N' 'AAL.O' ... 'KAMN.N' 'PI.O' 'ORA.N']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'PI.O' 'ORA.N' 'DERM.O']
total 1866 df
['A.N' 'AA.N' 'AAL.O' ... 'BFAM.N' 'PEGA.O' 'YRD.N']
total 1864 df
['A.N' 'AA.N' 'AAL.O' ... 'HK.N' 'NORD.N' 'VST.N']
total 1869 df
['A.N' 'AA.N' 'AAL.O' ... 'VST.N' 'AAWW.O' 'RPD.O']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'RPD.O' 'HRI.N' 'OMAM.N']
total 1869 df
['A.N' 'AA.N' 'AAL.O' ... 'JELD.N' 'KTOS.O' 'WPM.N']
total 1871 df
['A.N' 'AA.N' 'AAL.O' ... 'ADSW.N' 'MLI.N' 'TTD.O']
total 1873 df
['A.N' 'AA.N' 'AAL.O' ... 'B.N' 'CLDR.N' 'NSR.N']
total 1874 df
['A.N' 'AA.N' 'AAL.O' ... 'HDP.O' 'INGN.O' 'LOXO.O']
total 1878 df
['A.N' 'AA.N' 'AAL.O' ... 'NGG.N' 'SPTN.O' 'TGTX.O']
total 1877 df
['A.N' 'AA.N' 'AAL.O' ... 'TGTX.O' 'FGL.N' 'UBSH.O']
total 1876 df
['A.N' 'AA.N' 'AAL.O' ... 'TGTX.O' 'FGL.N' 'UBSH.O']
total 1870 df
['A.N' 'AA.N' 'AAL.O' ... 'IMMU.O' 'LL.N' 'SEDG.O']
total 1876 df
['A.N' 'AA.N' 'AAL.O' ... 'FSM.N' 'PHH.N' 'PSDO.O']
total 1880 df
['A.N' 'AA.N' 'AAL.O' ... 'PSDO.O' 'LTC.N' 'SEP.N']
total 1880 df
['A.N' 'AA.N' 'AAL.O' ... 'AWH.N' 'ENS.N' 'WBK.N']
total 1861 df
['A.N' 'AA.N' 'AAL.O' ... 'DEA.N' 'GDI.N' 'GMS.N']
total 1861 df
['A.N' 'AA.N' 'AAL.O' ... 'GLOB.N' 'KANG.O' 'OPB.O']
total 1863 df
['A.N' 'AA.N' 'AAL.O' ... 'KANG.O' 'OPB.O' 'WES.N']
total 1861 df
['A.N' 'AA.N' 'AAL.O' ... 'BHGE.N' 'LGIH.O' 'ORBC.O']
total 1862 df
['A.N' 'AA.N' 'AAL.O' ... 'NCS.N' 'PETS.O' 'REVG.N']
total 1865 df
['A.N' 'AA.N' 'AAL.O' ... 'PETS.O' 'REVG.N' 'HNI.N']
total 1838 df
['A.N' 'AA.N' 'AAL.O' ... 'ENIC.N' 'GEF.N' 'XENT.O']
```

```
total 1841 df
['A.N' 'AA.N' 'AAL.O' ... 'ACOR.O' 'ADC.N' 'DST.N']
total 1838 df
['A.N' 'AA.N' 'AAL.O' ... 'ADRO.O' 'CR.N' 'DFIN.N']
total 1837 df
['A.N' 'AA.N' 'AAL.O' ... 'CR.N' 'DFIN.N' 'OMER.O']
total 1831 df
['A.N' 'AA.N' 'AAL.O' ... 'HCC.N' 'PLYA.O' 'XRX.N']
total 1838 df
['A.N' 'AA.N' 'AAL.O' ... 'XRX.N' 'JHG.N' 'VC.N']
total 1837 df
['A.N' 'AA.N' 'AAL.O' ... 'VC.N' 'CWH.N' 'WAGE.N']
total 1835 df
['A.N' 'AA.N' 'AAL.O' ... 'CWH.N' 'WAGE.N' 'ANGI.O']
total 1835 df
['A.N' 'AA.N' 'AAL.O' ... 'ANGI.O' 'COTV.N' 'SNX.N']
total 1827 df
['A.N' 'AA.N' 'AAL.O' ... 'SNX.N' 'ASIX.N' 'NTB.N']
total 1826 df
['A.N' 'AA.N' 'AAL.O' ... 'ASIX.N' 'NTB.N' 'GTLS.O']
total 1827 df
['A.N' 'AA.N' 'AAL.O' ... 'CACC.O' 'FDS.N' 'POWI.O']
total 1825 df
['A.N' 'AA.N' 'AAL.O' ... 'FUL.N' 'NHI.N' 'OZRK.O']
total 1826 df
['A.N' 'AA.N' 'AAL.O' ... 'NHI.N' 'OZRK.O' 'SHLM.O']
total 1823 df
['A.N' 'AA.N' 'AAL.O' ... 'SHLM.O' 'PKY.N' 'TNET.N']
total 1824 df
['A.N' 'AA.N' 'AAL.O' ... 'SHLM.O' 'PKY.N' 'TNET.N']
total 1822 df
['A.N' 'AA.N' 'AAL.O' ... 'PZZA.O' 'SHLD.O' 'ZNGA.O']
total 1844 df
['A.N' 'AA.N' 'AAL.O' ... 'LAD.N' 'POOL.O' 'PTCT.O']
total 1849 df
['A.N' 'AA.N' 'AAL.O' ... 'PTCT.O' 'PLXS.O' 'RTRX.O']
total 1849 df
['A.N' 'AA.N' 'AAL.O' ... 'AABA.O' 'GWPH.O' 'SPH.N']
total 1851 df
['A.N' 'AA.N' 'AAL.O' ... 'GTY.N' 'SMCI.O' 'YRD.N']
total 1854 df
['A.N' 'AA.N' 'AAL.O' ... 'SMCI.O' 'YRD.N' 'EEFT.O']
total 1854 df
['A.N' 'AA.N' 'AAL.O' ... 'EBR.N' 'RGA.N' 'RYAAY.O']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'RGA.N' 'RYAAY.O' 'ACRS.O']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'SRG.N' 'SWIR.O' 'TECH.O']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'HK.N' 'SODA.O' 'TTS.O']
total 1871 df
['A.N' 'AA.N' 'AAL.O' ... 'BFR.N' 'ENSG.O' 'SOHU.O']
total 1872 df
['A.N' 'AA.N' 'AAL.O' ... 'BHE.N' 'GNRC.N' 'SGMO.O']
total 1874 df
['A.N' 'AA.N' 'AAL.O' ... 'CMPR.O' 'PEGA.O' 'SNCR.O']
total 1874 df
['A.N' 'AA.N' 'AAL.O' ... 'NDRM.O' 'SAND.A' 'UBSH.O']
total 1878 df
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total 1878 df
['A.N' 'AA.N' 'AAL.O' ... 'CRL.N' 'HIFR.N' 'RNR.N']
total 1882 df
['A.N' 'AA.N' 'AAL.O' ... 'JKS.N' 'KRA.N' 'VIRT.O']
total 1883 df
['A.N' 'AA.N' 'AAL.O' ... 'RDY.N' 'SNC.O' 'TKC.N']
total 1883 df
['A.N' 'AA.N' 'AABA.O' ... 'PRTY.N' 'RRGB.O' 'RUSHA.O']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'SFR.N' 'TGTX.O' 'UCTT.O']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'UCTT.O' 'SSW.N' 'TREX.N']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'SSTK.N' 'USCR.O' 'WD.N']
total 1893 df
['A.N' 'AA.N' 'AABA.O' ... 'WD.N' 'SVU.N' 'WMS.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'CBM.N' 'SSRM.O' 'WCG.N']
total 1891 df
['A.N' 'AA.N' 'AABA.O' ... 'JBGS.N' 'RBC.N' 'REV.N']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'REV.N' 'BHF.O' 'NGHC.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'AXON.O' 'LBRDA.O' 'MGP.N']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'MGP.N' 'NEO.O' 'TK.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'TK.N' 'LTC.N' 'PRIM.O']
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'ALEX.N' 'DVAX.O' 'GOGL.O']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'GOGL.O' 'GOLF.N' 'LPSN.O']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'GOGL.O' 'GOLF.N' 'LPSN.O']
total 1886 df
['A.N' 'AA.N' 'AABA.O' ... 'KL.N' 'MYOK.O' 'TOUR.O']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'FDS.N' 'JOE.N' 'RDFN.O']
total 1881 df
['A.N' 'AA.N' 'AABA.O' ... 'RDFN.O' 'ANGI.O' 'BGG.N']
total 1881 df
['A.N' 'AA.N' 'AABA.O' ... 'APOG.O' 'FLXN.O' 'HEI.N']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'NGG.N' 'NGVT.N' 'WDAY.O']
total 1875 df
['A.N' 'AA.N' 'AABA.O' ... 'NGVT.N' 'WDAY.O' 'NEWM.N']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'NEWM.N' 'BIP.N' 'SPPI.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'RGR.N' 'TSLX.N' 'TYPE.O']
total 1873 df
['A.N' 'AA.N' 'AABA.O' ... 'TSLX.N' 'TYPE.O' 'WIFI.O']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'TSLX.N' 'TYPE.O' 'WIFI.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'WIFI.O' 'AKCA.O' 'VNDA.O']
total 1871 df
['A.N' 'AA.N' 'AABA.O' ... 'VNDA.O' 'ANF.N' 'ENLC.N']
total 1871 df
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total 1871 df
['A.N' 'AA.N' 'AABA.O' ... 'ANF.N' 'ENLC.N' 'CUK.N']
total 1871 df
['A.N' 'AA.N' 'AABA.O' ... 'AKBA.O' 'SHEN.O' 'VRNS.O']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'SHEN.O' 'VRNS.O' 'ABM.N']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'CYTK.O' 'GATX.N' 'SBCF.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'INGN.O' 'SCHL.O' 'SUPV.N']
total 1875 df
['A.N' 'AA.N' 'AABA.O' ... 'NS.N' 'SHLX.N' 'TXMD.O']
total 1879 df
['A.N' 'AA.N' 'AABA.O' ... 'TXMD.O' 'IRT.N' 'KRNY.O']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'ALV.N' 'FFIN.O' 'ITCI.O']
total 1879 df
['A.N' 'AA.N' 'AABA.O' ... 'NTLA.O' 'QLYS.O' 'VNTR.N']
total 1883 df
['A.N' 'AA.N' 'AABA.O' ... 'VNTR.N' 'AAAP.O' 'BKE.N']
total 1884 df
['A.N' 'AA.N' 'AABA.O' ... 'HUBS.N' 'NCI.N' 'RGNX.O']
total 1886 df
['A.N' 'AA.N' 'AABA.O' ... 'RGNX.O' 'EVTC.N' 'NR.N']
total 1884 df
['A.N' 'AA.N' 'AABA.O' ... 'EVTC.N' 'NR.N' 'MFGP.N']
total 1882 df
['A.N' 'AA.N' 'AABA.O' ... 'FDP.N' 'IEX.N' 'SSNI.N']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'FCPT.N' 'FMSA.N' 'GGG.N']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'GGG.N' 'CCC.N' 'MTN.N']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'GGG.N' 'CCC.N' 'MTN.N']
total 1876 df
['A.N' 'AA.N' 'AABA.O' ... 'CCC.N' 'MTN.N' 'WEB.O']
total 1876 df
['A.N' 'AA.N' 'AABA.O' ... 'MTN.N' 'WEB.O' 'CSGP.O']
total 1867 df
['A.N' 'AA.N' 'AABA.O' ... 'BKI.N' 'CMPR.O' 'GBX.N']
total 1868 df
['A.N' 'AA.N' 'AABA.O' ... 'ACLS.O' 'BLDP.O' 'ECPG.O']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'DIN.N' 'GTLS.O' 'TPR.N']
total 1864 df
['A.N' 'AA.N' 'AABA.O' ... 'CONN.O' 'PPBI.O' 'SNBR.O']
total 1862 df
['A.N' 'AA.N' 'AAAP.O' ... 'CONN.O' 'PPBI.O' 'SNBR.O']
total 1839 df
['A.N' 'AA.N' 'AAAP.O' ... 'DBVT.O' 'MSGN.N' 'TLK.N']
total 1842 df
['A.N' 'AA.N' 'AAAP.O' ... 'MSGN.N' 'TLK.N' 'NVMI.O']
total 1842 df
['A.N' 'AA.N' 'AAAP.O' ... 'MSGN.N' 'TLK.N' 'NVMI.O']
total 1838 df
['A.N' 'AA.N' 'AAAP.O' ... 'TLK.N' 'NVMI.O' 'ANAB.O']
total 1835 df
['A.N' 'AA.N' 'AAAP.O' ... 'ANAB.O' 'AXDX.O' 'REVG.N']
total 1834 df
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['A.N' 'AA.N' 'AAAP.O' ... 'FMX.N' 'MLNX.O' 'SSTK.N']
total 1836 df
['A.N' 'AA.N' 'AAAP.O' ... 'SSTK.N' 'GOGL.O' 'ZGNX.O']
total 1837 df
['A.N' 'AA.N' 'AAAP.O' ... 'GOGL.O' 'ZGNX.O' 'AY.O']
total 1833 df
['A.N' 'AA.N' 'AAAP.O' ... 'SFNC.O' 'SMI.N' 'YEXT.N']
total 1835 df
['A.N' 'AA.N' 'AAAP.O' ... 'YEXT.N' 'LCI.N' 'PQG.N']
total 1834 df
['A.N' 'AA.N' 'AAAP.O' ... 'NMIH.O' 'OSTK.O' 'RXDX.O']
total 1837 df
['A.N' 'AA.N' 'AAAP.O' ... 'NMIH.O' 'OSTK.O' 'RXDX.O']
total 1834 df
['A.N' 'AA.N' 'AAAP.O' ... 'OSTK.O' 'RXDX.O' 'FTS.N']
total 1830 df
['A.N' 'AA.N' 'AAAP.O' ... 'CLH.N' 'ETH.N' 'VHI.N']
total 1830 df
['A.N' 'AA.N' 'AAAP.O' ... 'VHI.N' 'CRAY.O' 'DORM.O']
total 1824 df
['A.N' 'AA.N' 'AAAP.O' ... 'DORM.O' 'CACC.O' 'ORBK.O']
total 1826 df
['A.N' 'AA.N' 'AAAP.O' ... 'PDS.N' 'SSD.N' 'WGL.N']
total 1827 df
['A.N' 'AA.N' 'AAAP.O' ... 'AZUL.N' 'BXS.N' 'QLYS.O']
total 1827 df
['A.N' 'AA.N' 'AAAP.O' ... 'QLYS.O' 'CARG.O' 'ITRI.O']
total 1816 df
['A.N' 'AA.N' 'AAAP.O' ... 'TOUR.O' 'TWO.N' 'VRNS.O']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'VRNS.O' 'CALD.O' 'JLL.N']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'APTV.N' 'NVRO.N' 'SITE.N']
total 1816 df
['A.N' 'AA.N' 'AAAP.O' ... 'NVRO.N' 'SITE.N' 'QD.N']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'QD.N' 'PEGA.O' 'SPTN.O']
total 1812 df
['A.N' 'AA.N' 'AAAP.O' ... 'MULE.N' 'TPC.N' 'WLL.N']
total 1813 df
['A.N' 'AA.N' 'AAAP.O' ... 'GOLF.N' 'RDY.N' 'SE.N']
total 1815 df
['A.N' 'AA.N' 'AAAP.O' ... 'SE.N' 'CADE.N' 'KRNY.O']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'SE.N' 'CADE.N' 'KRNY.O']
total 1811 df
['A.N' 'AA.N' 'AAAP.O' ... 'FANH.O' 'LHCG.O' 'PETS.O']
total 1807 df
['A.N' 'AA.N' 'AAAP.O' ... 'LHCG.O' 'PETS.O' 'PSDO.O']
total 1808 df
['A.N' 'AA.N' 'AAAP.O' ... 'PFG.O' 'TLRD.N' 'WLH.N']
total 1809 df
['A.N' 'AA.N' 'AAAP.O' ... 'NCLH.N' 'PFS.N' 'UFPI.O']
total 1812 df
['A.N' 'AA.N' 'AAAP.O' ... 'PEP.O' 'RDSb.N' 'XNET.O']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'AQUA.N' 'NSIT.O' 'WOW.N']
total 1817 df
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['A.N' 'AA.N' 'AAAP.O' ... 'NSIT.O' 'WOW.N' 'MLHR.O']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'MLHR.O' 'CTMX.O' 'RYAM.N']
total 1815 df
['A.N' 'AA.N' 'AAAP.O' ... 'MLHR.O' 'CTMX.O' 'RYAM.N']
total 1810 df
['A.N' 'AA.N' 'AAAP.O' ... 'SAVE.N' 'SOGO.N' 'UBSH.O']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'LILKV.O' 'MEDP.O' 'PPDF.N']
total 1821 df
['A.N' 'AA.N' 'AAAP.O' ... 'NTR.N' 'TOO.N' 'XEL.O']
total 1825 df
['A.N' 'AA.N' 'AAAP.O' ... 'NCS.N' 'RVNC.O' 'WTTR.N']
total 1827 df
['A.N' 'AA.N' 'AAAP.O' ... 'ALV.N' 'CALM.O' 'OSIS.O']
total 1824 df
['A.N' 'AA.N' 'AAAP.O' ... 'CALM.O' 'OSIS.O' 'GATX.N']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'DHI.N' 'IMGN.O' 'SYNH.O']
total 1818 df
['A.N' 'AA.N' 'AAAP.O' ... 'IMGN.O' 'SYNH.O' 'HASI.N']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'CSGP.O' 'QGEN.N' 'STE.N']
total 1813 df
['A.N' 'AA.N' 'AAAP.O' ... 'STE.N' 'GGG.N' 'NDSN.O']
total 1803 df
['A.N' 'AA.N' 'AAAP.O' ... 'ATU.N' 'BRKL.O' 'IMPV.O']
total 1805 df
['A.N' 'AA.N' 'AAAP.O' ... 'OGS.N' 'VNOM.O' 'WP.N']
total 1811 df
['A.N' 'AA.N' 'AAAP.O' ... 'FDS.N' 'GES.N' 'ORAN.N']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'ORAN.N' 'BABY.O' 'GTE.A']
total 1810 df
['A.N' 'AA.N' 'AAAP.O' ... 'CROX.O' 'HEI.N' 'SUN.N']
total 1807 df
['A.N' 'AA.N' 'AAAP.O' ... 'SUN.N' 'APOG.O' 'PDS.N']
total 1808 df
['A.N' 'AA.N' 'AAAP.O' ... 'APOG.O' 'PDS.N' 'GWB.N']
total 1800 df
['A.N' 'AA.N' 'AAAP.O' ... 'CRSP.O' 'DLPH.N' 'OKTA.O']
total 1800 df
['A.N' 'AA.N' 'AABA.O' ... 'CRSP.O' 'DLPH.N' 'OKTA.O']
total 1794 df
['A.N' 'AA.N' 'AABA.O' ... 'CRSP.O' 'DLPH.N' 'OKTA.O']
total 1792 df
['A.N' 'AA.N' 'AABA.O' ... 'CEIX.N' 'HII.N' 'LSTR.O']
total 1794 df
['A.N' 'AA.N' 'AABA.O' ... 'HOLI.O' 'IDA.N' 'SSW.N']
total 1793 df
['A.N' 'AA.N' 'AABA.O' ... 'INXN.N' 'KND.N' 'LFIN.O']
total 1792 df
['A.N' 'AA.N' 'AABA.O' ... 'AMG.N' 'TK.N' 'WCC.N']
total 1789 df
['A.N' 'AA.N' 'AABA.O' ... 'EURN.N' 'NHI.N' 'NMRK.O']
total 1792 df
['A.N' 'AA.N' 'AABA.O' ... 'KTWO.O' 'SAP.N' 'SCHN.O']
total 1798 df
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['A.N' 'AA.N' 'AABA.O' ... 'LMNX.O' 'RCI.N' 'SASR.O']
total 1803 df
['A.N' 'AA.N' 'AABA.O' ... 'RCI.N' 'SASR.O' 'FTS.N']
total 1802 df
['A.N' 'AA.N' 'AABA.O' ... 'SBCF.O' 'TKC.N' 'WST.N']
total 1806 df
['A.N' 'AA.N' 'AABA.O' ... 'ICL.N' 'LII.N' 'MAIN.N']
total 1808 df
['A.N' 'AA.N' 'AABA.O' ... 'RHP.N' 'SUPV.N' 'WBC.N']
total 1820 df
['A.N' 'AA.N' 'AABA.O' ... 'ORBK.O' 'TEP.N' 'VC.O']
total 1818 df
['A.N' 'AA.N' 'AABA.O' ... 'AVYA.N' 'BGNE.O' 'CHU.N']
total 1821 df
['A.N' 'AA.N' 'AABA.O' ... 'CHU.N' 'ATKR.N' 'EVR.N']
total 1817 df
['A.N' 'AA.N' 'AABA.O' ... 'OEC.N' 'PTCT.O' 'SSL.N']
total 1820 df
['A.N' 'AA.N' 'AABA.O' ... 'SSL.N' 'ADMS.O' 'AWR.N']
total 1821 df
['A.N' 'AA.N' 'AABA.O' ... 'MNRO.O' 'RPD.O' 'SXT.N']
total 1826 df
['A.N' 'AA.N' 'AABA.O' ... 'MTH.N' 'RDY.N' 'SSD.N']
total 1829 df
['A.N' 'AA.N' 'AABA.O' ... 'CCMP.O' 'CWT.N' 'HUBG.O']
total 1829 df
['A.N' 'AA.N' 'AABA.O' ... 'ORBC.O' 'PCTY.O' 'RELX.N']
total 1833 df
['A.N' 'AA.N' 'AABA.O' ... 'CLH.N' 'MATX.N' 'WGL.N']
total 1838 df
['A.N' 'AA.N' 'AABA.O' ... 'CR.N' 'MCY.N' 'WELL.N']
total 1838 df
['A.N' 'AA.N' 'AABA.O' ... 'WELL.N' 'BDC.N' 'GNBC.O']
total 1837 df
['A.N' 'AA.N' 'AABA.O' ... 'LBRT.N' 'SR.N' 'VREX.O']
total 1842 df
['A.N' 'AA.N' 'AABA.O' ... 'RUSHA.O' 'SNHY.O' 'VIRT.O']
total 1849 df
['A.N' 'AA.N' 'AABA.O' ... 'VIRT.O' 'BANR.O' 'TTEK.O']
total 1848 df
['A.N' 'AA.N' 'AABA.O' ... 'JRVR.O' 'MLI.N' 'RBC.N']
total 1848 df
['A.N' 'AA.N' 'AABA.O' ... 'PSO.N' 'TEGP.N' 'VRTU.O']
total 1855 df
['A.N' 'AA.N' 'AABA.O' ... 'HSC.N' 'MB.O' 'MHO.N']
total 1857 df
['A.N' 'AA.N' 'AABA.O' ... 'POOL.O' 'SODA.O' 'WEB.O']
total 1862 df
['A.N' 'AA.N' 'AABA.O' ... 'WEB.O' 'AYR.N' 'VRNS.O']
total 1861 df
['A.N' 'AA.N' 'AABA.O' ... 'REI.A' 'TRUP.O' 'VRNT.O']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'SHLM.O' 'TGTX.O' 'VECO.O']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'VECO.O' 'BEL.N' 'FG.N']
total 1866 df
['A.N' 'AA.N' 'AABA.O' ... 'ENSG.O' 'HMY.N' 'PRIM.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'LZB.N' 'NCI.N' 'PRAA.O']
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[ A.N   AA.N   AABA.O  ...  LZB.N   NCI.N   PRAA.O ]
total 1874 df
['A.N' 'AA.N' 'AABA.O' ... 'SSTK.N' 'TYPE.O' 'VICI.N']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'FTSI.N' 'GHDX.O' 'HEES.O']
total 1876 df
['A.N' 'AA.N' 'AABA.O' ... 'TBPH.O' 'TK.N' 'WAIR.N']
total 1884 df
['A.N' 'AA.N' 'AABA.O' ... 'ITRI.O' 'NEWM.N' 'PGTI.N']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'GMLP.O' 'MGNX.O' 'SRG.N']
total 1893 df
['A.N' 'AA.N' 'AABA.O' ... 'RVNC.O' 'WAGE.N' 'XNCR.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'WAGE.N' 'XNCR.O' 'MMSI.O']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'MUFG.N' 'SAIC.N' 'VNDA.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'COLL.O' 'LPSN.O' 'TUSK.O']
total 1899 df
['A.N' 'AA.N' 'AABA.O' ... 'TUSK.O' 'NCS.N' 'RGNX.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'RGNX.O' 'SWX.N' 'TFX.N']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'SWX.N' 'TFX.N' 'AZUL.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'KANG.O' 'MRTX.O' 'PPDF.N']
total 1893 df
['A.N' 'AA.N' 'AABA.O' ... 'AYX.N' 'BHVN.N' 'MDGL.O']
total 1891 df
['A.N' 'AA.N' 'AABA.O' ... 'BHVN.N' 'MDGL.O' 'ADC.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'ADAP.O' 'AMWD.O' 'EYE.O']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'NEOG.O' 'OCFC.O' 'WOR.N']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'GCO.N' 'LX.O' 'SGH.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'CISN.N' 'GPI.N' 'TCP.N']
total 1898 df
['A.N' 'AA.N' 'AABA.O' ... 'ASX_w.N' 'CRON.O' 'FSCT.O']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'HOME.N' 'QIWI.O' 'STC.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'GWB.N' 'RUN.O' 'SASR.O']
total 1891 df
['A.N' 'AA.N' 'AABA.O' ... 'DM.N' 'PLXS.O' 'PRFT.O']
total 1894 df
['A.N' 'AA.N' 'AABA.O' ... 'PLXS.O' 'PRFT.O' 'BFAM.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'PLXS.O' 'PRFT.O' 'BFAM.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'CALM.O' 'FDS.N' 'KRNY.O']
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'NSIT.O' 'SODA.O' 'WD.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'LAD.N' 'LBRDA.O' 'SNX.N']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'SNX.N' 'FMX.N' 'SATS.O']
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total 1894 df
['A.N' 'AA.N' 'AABA.O' ... 'MRTN.O' 'SCHN.O' 'SEND.N']
total 1898 df
['A.N' 'AA.N' 'AABA.O' ... 'SAIA.O' 'TKC.N' 'ZS.O']
total 1902 df
['A.N' 'AA.N' 'AABA.O' ... 'ZS.O' 'BAK.N' 'PSO.N']
total 1904 df
['A.N' 'AA.N' 'AABA.O' ... 'MUSA.N' 'QRTEA.O' 'WGL.N']
total 1906 df
['A.N' 'AA.N' 'AABA.O' ... 'AVT.O' 'GIL.N' 'SGRY.O']
total 1909 df
['A.N' 'AA.N' 'AABA.O' ... 'GIL.N' 'SGRY.O' 'AMC.N']
total 1908 df
['A.N' 'AA.N' 'AABA.O' ... 'ATR.N' 'DBX.O' 'ENLC.N']
total 1906 df
['A.N' 'AA.N' 'AABA.O' ... 'NXEO.O' 'VRNS.O' 'WBC.N']
total 1913 df
['A.N' 'AA.N' 'AABA.O' ... 'QURE.O' 'RACE.N' 'TRHC.O']
total 1914 df
['A.N' 'AA.N' 'AABA.O' ... 'CCOI.O' 'NSP.N' 'ONE.N']
total 1917 df
['A.N' 'AA.N' 'AABA.O' ... 'CPA.N' 'IQ.O' 'ROKU.O']
total 1918 df
['A.N' 'AA.N' 'AABA.O' ... 'CW.N' 'LTC.N' 'RNR.N']
total 1917 df
['A.N' 'AA.N' 'AABA.O' ... 'LTC.N' 'RNR.N' 'SCOR.OB']
total 1915 df
['A.N' 'AA.N' 'AABA.O' ... 'JOE.N' 'MIME.O' 'SPOT.N']
total 1920 df
['A.N' 'AA.N' 'AABA.O' ... 'SPOT.N' 'MDXG.O' 'TSG.O']
total 1918 df
['A.N' 'AA.N' 'AABA.O' ... 'RMP.N' 'TX.N' 'WCC.N']
total 1920 df
['A.N' 'AA.N' 'AABA.O' ... 'BFR.N' 'BTE.N' 'JEF.N']
total 1918 df
['A.N' 'AA.N' 'AABA.O' ... 'KTWO.O' 'SUPV.N' 'TTEK.O']
total 1919 df
['A.N' 'AA.N' 'AABA.O' ... 'AXGN.O' 'ENVA.N' 'VAC.N']
total 1921 df
['A.N' 'AA.N' 'AABA.O' ... 'VAC.N' 'AROC.N' 'KMPR.N']
total 1917 df
['A.N' 'AA.N' 'AABA.O' ... 'MEDP.O' 'MSGN.N' 'MTGE.O']
total 1918 df
['A.N' 'AA.N' 'AABA.O' ... 'LOMA.N' 'PAM.N' 'WYND.N']
total 1910 df
['A.N' 'AA.N' 'AABA.O' ... 'SSP.O' 'STNG.N' 'WBK.N']
total 1911 df
['A.N' 'AA.N' 'AABA.O' ... 'PRA.N' 'RCM.O' 'WTI.N']
total 1912 df
['A.N' 'AA.N' 'AABA.O' ... 'ENTA.O' 'RDY.N' 'TPIC.O']
total 1912 df
['A.N' 'AA.N' 'AABA.O' ... 'DNB.N' 'EAF.N' 'NGL.N']
total 1907 df
['A.N' 'AA.N' 'AABA.O' ... 'CLBK.O' 'MDR.N' 'PVTL.N']
total 1908 df
['A.N' 'AA.N' 'AABA.O' ... 'BRKL.O' 'CHRS.O' 'NEO.O']
total 1909 df
['A.N' 'AA.N' 'AABA.O' ... 'KPTI.O' 'STBZ.O' 'TEO.N']
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total 1907 df
['A.N' 'AA.N' 'AABA.O' ... 'KPTI.O' 'STBZ.O' 'TEO.N']
total 1903 df
['A.N' 'AA.N' 'AABA.O' ... 'STBZ.O' 'TEO.N' 'CDAY.N']
total 1894 df
['A.N' 'AA.N' 'AABA.O' ... 'PPDF.N' 'SITE.N' 'STAA.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'OMER.O' 'PRIM.O' 'SRG.N']
total 1898 df
['A.N' 'AA.N' 'AABA.O' ... 'PRIM.O' 'SRG.N' 'DDR.N']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'SRG.N' 'DDR.N' 'FOSL.O']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'FOSL.O' 'NOAH.N' 'PVAC.O']
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'CBLK.O' 'UVV.N' 'VNDA.O']
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'LTRPA.O' 'RHP.N' 'VRNT.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'RHP.N' 'VRNT.O' 'STAY.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'EQH.N' 'FANH.O' 'MDGL.O']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'MDGL.O' 'HUYA.N' 'SMPL.O']
total 1861 df
['A.N' 'AA.N' 'AABA.O' ... 'GTHX.O' 'LZB.N' 'VSTO.N']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'IRTC.O' 'TCMD.O' 'TGE.N']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'TGE.N' 'DXC.N' 'HLI.N']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'GWB.N' 'NCS.N' 'PS.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'PS.O' 'BHLB.N' 'CVNA.N']
total 1862 df
['A.N' 'AA.N' 'AABA.O' ... 'MDB.O' 'MLHR.O' 'WH.N']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'MDB.O' 'MLHR.O' 'WH.N']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'RACE.N' 'SAIA.O' 'TREE.O']
total 1867 df
['A.N' 'AA.N' 'AABA.O' ... 'GSKY.O' 'JWa.N' 'PRSP.N']
total 1860 df
['A.N' 'AA.N' 'AABA.O' ... 'BHE.N' 'BHVN.N' 'FCB.N']
total 1862 df
['A.N' 'AA.N' 'AABA.O' ... 'XENT.O' 'XPER.O' 'ZIOP.O']
total 2115 df
['A.N' 'AA.N' 'AABA.O' ... 'XENT.O' 'XPER.O' 'ZIOP.O']
total 2115 df
['A.N' 'AA.N' 'AABA.O' ... 'CCC.N' 'DGI.N' 'PLYA.O']
total 2115 df
['A.N' 'AA.N' 'AABA.O' ... 'DGI.N' 'PLYA.O' 'VC.N']
total 2111 df
['A.N' 'AA.N' 'AABA.O' ... 'PLYA.O' 'VC.N' 'CWH.N']
total 2112 df
['A.N' 'AA.N' 'AABA.O' ... 'PLYA.O' 'VC.N' 'CWH.N']
total 2110 df
['A.N' 'AA.N' 'AABA.O' ... 'VC.N' 'CWH.N' 'SNX.N']
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total 2110 df
['A.N' 'AA.N' 'AABA.O' ... 'SNX.N' 'ASIX.N' 'NTB.N']
total 2108 df
['A.N' 'AA.N' 'AABA.O' ... 'SNX.N' 'ASIX.N' 'NTB.N']
total 2105 df
['A.N' 'AA.N' 'AABA.O' ... 'CACC.O' 'FDS.N' 'POWI.O']
total 2106 df
['A.N' 'AA.N' 'AABA.O' ... 'FDS.N' 'POWI.O' 'NHI.N']
total 2107 df
['A.N' 'AA.N' 'AABA.O' ... 'POWI.O' 'NHI.N' 'SHLM.O']
total 2108 df
['A.N' 'AA.N' 'AABA.O' ... 'NHI.N' 'SHLM.O' 'PKY.N']
total 2108 df
['A.N' 'AA.N' 'AABA.O' ... 'NHI.N' 'SHLM.O' 'PKY.N']
total 2106 df
['A.N' 'AA.N' 'AAL.O' ... 'PZZA.O' 'SHLD.O' 'ZNGA.O']
total 1844 df
['A.N' 'AA.N' 'AAL.O' ... 'LAD.N' 'POOL.O' 'PTCT.O']
total 1849 df
['A.N' 'AA.N' 'AAL.O' ... 'PTCT.O' 'PLXS.O' 'RTRX.O']
total 1849 df
['A.N' 'AA.N' 'AAL.O' ... 'AABA.O' 'GWPH.O' 'SPH.N']
total 1851 df
['A.N' 'AA.N' 'AAL.O' ... 'GTY.N' 'SMCI.O' 'YRD.N']
total 1854 df
['A.N' 'AA.N' 'AAL.O' ... 'SMCI.O' 'YRD.N' 'EEFT.O']
total 1854 df
['A.N' 'AA.N' 'AAL.O' ... 'EBR.N' 'RGA.N' 'RYAAY.O']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'RGA.N' 'RYAAY.O' 'ACRS.O']
total 1859 df
['A.N' 'AA.N' 'AAL.O' ... 'SRG.N' 'SWIR.O' 'TECH.O']
total 1868 df
['A.N' 'AA.N' 'AAL.O' ... 'HK.N' 'SODA.O' 'TTS.O']
total 1871 df
['A.N' 'AA.N' 'AAL.O' ... 'BFR.N' 'ENSG.O' 'SOHU.O']
total 1872 df
['A.N' 'AA.N' 'AAL.O' ... 'BHE.N' 'GNRC.N' 'SGMO.O']
total 1874 df
['A.N' 'AA.N' 'AAL.O' ... 'CMPR.O' 'PEGA.O' 'SNCR.O']
total 1874 df
['A.N' 'AA.N' 'AAL.O' ... 'NDRM.O' 'SAND.A' 'UBSH.O']
total 1878 df
['A.N' 'AA.N' 'AAL.O' ... 'CRL.N' 'HIFR.N' 'RNR.N']
total 1882 df
['A.N' 'AA.N' 'AAL.O' ... 'JKS.N' 'KRA.N' 'VIRT.O']
total 1883 df
['A.N' 'AA.N' 'AAL.O' ... 'RDY.N' 'SNC.O' 'TKC.N']
total 1883 df
['A.N' 'AA.N' 'AABA.O' ... 'PRTY.N' 'RRGB.O' 'RUSHA.O']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'SFR.N' 'TGTX.O' 'UCTT.O']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'UCTT.O' 'SSW.N' 'TREX.N']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'SSTK.N' 'USCR.O' 'WD.N']
total 1893 df
['A.N' 'AA.N' 'AABA.O' ... 'WD.N' 'SVU.N' 'WMS.N']
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total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'CBM.N' 'SSRM.O' 'WCG.N']
total 1891 df
['A.N' 'AA.N' 'AABA.O' ... 'JBGS.N' 'RBC.N' 'REV.N']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'REV.N' 'BHF.O' 'NGHC.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'AXON.O' 'LBRDA.O' 'MGP.N']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'MGP.N' 'NEO.O' 'TK.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'TK.N' 'LTC.N' 'PRIM.O']
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'ALEX.N' 'DVAX.O' 'GOGL.O']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'GOGL.O' 'GOLF.N' 'LPSN.O']
total 1888 df
['A.N' 'AA.N' 'AABA.O' ... 'GOGL.O' 'GOLF.N' 'LPSN.O']
total 1886 df
['A.N' 'AA.N' 'AABA.O' ... 'KL.N' 'MYOK.O' 'TOUR.O']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'FDS.N' 'JOE.N' 'RDFN.O']
total 1881 df
['A.N' 'AA.N' 'AABA.O' ... 'RDFN.O' 'ANGI.O' 'BGG.N']
total 1881 df
['A.N' 'AA.N' 'AABA.O' ... 'APOG.O' 'FLXN.O' 'HEI.N']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'NGG.N' 'NGVT.N' 'WDAY.O']
total 1875 df
['A.N' 'AA.N' 'AABA.O' ... 'NGVT.N' 'WDAY.O' 'NEWM.N']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'NEWM.N' 'BIP.N' 'SPPI.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'RGR.N' 'TSLX.N' 'TYPE.O']
total 1873 df
['A.N' 'AA.N' 'AABA.O' ... 'TSLX.N' 'TYPE.O' 'WIFI.O']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'TSLX.N' 'TYPE.O' 'WIFI.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'WIFI.O' 'AKCA.O' 'VNDA.O']
total 1871 df
['A.N' 'AA.N' 'AABA.O' ... 'VNDA.O' 'ANF.N' 'ENLC.N']
total 1871 df
['A.N' 'AA.N' 'AABA.O' ... 'ANF.N' 'ENLC.N' 'CUK.N']
total 1871 df
['A.N' 'AA.N' 'AABA.O' ... 'AKBA.O' 'SHEN.O' 'VRNS.O']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'SHEN.O' 'VRNS.O' 'ABM.N']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'CYTK.O' 'GATX.N' 'SBCF.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'INGN.O' 'SCHL.O' 'SUPV.N']
total 1875 df
['A.N' 'AA.N' 'AABA.O' ... 'NS.N' 'SHLX.N' 'TXMD.O']
total 1879 df
['A.N' 'AA.N' 'AABA.O' ... 'TXMD.O' 'IRT.N' 'KRNY.O']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'ALV.N' 'FFIN.O' 'ITCI.O']
total 1879 df
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total 1879 df
['A.N' 'AA.N' 'AABA.O' ... 'NTLA.O' 'QLYS.O' 'VNTR.N']
total 1883 df
['A.N' 'AA.N' 'AABA.O' ... 'VNTR.N' 'AAAP.O' 'BKE.N']
total 1884 df
['A.N' 'AA.N' 'AABA.O' ... 'HUBS.N' 'NCI.N' 'RGNX.O']
total 1886 df
['A.N' 'AA.N' 'AABA.O' ... 'RGNX.O' 'EVTC.N' 'NR.N']
total 1884 df
['A.N' 'AA.N' 'AABA.O' ... 'EVTC.N' 'NR.N' 'MFGP.N']
total 1882 df
['A.N' 'AA.N' 'AABA.O' ... 'FDP.N' 'IEX.N' 'SSNI.N']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'FCPT.N' 'FMSA.N' 'GGG.N']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'GGG.N' 'CCC.N' 'MTN.N']
total 1880 df
['A.N' 'AA.N' 'AABA.O' ... 'GGG.N' 'CCC.N' 'MTN.N']
total 1876 df
['A.N' 'AA.N' 'AABA.O' ... 'CCC.N' 'MTN.N' 'WEB.O']
total 1876 df
['A.N' 'AA.N' 'AABA.O' ... 'MTN.N' 'WEB.O' 'CSGP.O']
total 1867 df
['A.N' 'AA.N' 'AABA.O' ... 'BKI.N' 'CMPR.O' 'GBX.N']
total 1868 df
['A.N' 'AA.N' 'AABA.O' ... 'ACLS.O' 'BLDP.O' 'ECPG.O']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'DIN.N' 'GTLS.O' 'TPR.N']
total 1864 df
['A.N' 'AA.N' 'AABA.O' ... 'CONN.O' 'PPBI.O' 'SNBR.O']
total 1862 df
['A.N' 'AA.N' 'AAAP.O' ... 'CONN.O' 'PPBI.O' 'SNBR.O']
total 1839 df
['A.N' 'AA.N' 'AAAP.O' ... 'DBVT.O' 'MSGN.N' 'TLK.N']
total 1842 df
['A.N' 'AA.N' 'AAAP.O' ... 'MSGN.N' 'TLK.N' 'NVMI.O']
total 1842 df
['A.N' 'AA.N' 'AAAP.O' ... 'MSGN.N' 'TLK.N' 'NVMI.O']
total 1838 df
['A.N' 'AA.N' 'AAAP.O' ... 'TLK.N' 'NVMI.O' 'ANAB.O']
total 1835 df
['A.N' 'AA.N' 'AAAP.O' ... 'ANAB.O' 'AXDX.O' 'REVG.N']
total 1834 df
['A.N' 'AA.N' 'AAAP.O' ... 'FMX.N' 'MLNX.O' 'SSTK.N']
total 1836 df
['A.N' 'AA.N' 'AAAP.O' ... 'SSTK.N' 'GOGL.O' 'ZGNX.O']
total 1837 df
['A.N' 'AA.N' 'AAAP.O' ... 'GOGL.O' 'ZGNX.O' 'AY.O']
total 1833 df
['A.N' 'AA.N' 'AAAP.O' ... 'SFNC.O' 'SMI.N' 'YEXT.N']
total 1835 df
['A.N' 'AA.N' 'AAAP.O' ... 'YEXT.N' 'LCI.N' 'PQG.N']
total 1834 df
['A.N' 'AA.N' 'AAAP.O' ... 'NMIH.O' 'OSTK.O' 'RXDX.O']
total 1837 df
['A.N' 'AA.N' 'AAAP.O' ... 'NMIH.O' 'OSTK.O' 'RXDX.O']
total 1834 df
['A.N' 'AA.N' 'AAAP.O' ... 'OSTK.O' 'RXDX.O' 'FTS.N']
total 1830 df
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['A.N' 'AA.N' 'AAAP.O' ... 'CLH.N' 'ETH.N' 'VHI.N']
total 1830 df
['A.N' 'AA.N' 'AAAP.O' ... 'VHI.N' 'CRAY.O' 'DORM.O']
total 1824 df
['A.N' 'AA.N' 'AAAP.O' ... 'DORM.O' 'CACC.O' 'ORBK.O']
total 1826 df
['A.N' 'AA.N' 'AAAP.O' ... 'PDS.N' 'SSD.N' 'WGL.N']
total 1827 df
['A.N' 'AA.N' 'AAAP.O' ... 'AZUL.N' 'BXS.N' 'QLYS.O']
total 1827 df
['A.N' 'AA.N' 'AAAP.O' ... 'QLYS.O' 'CARG.O' 'ITRI.O']
total 1816 df
['A.N' 'AA.N' 'AAAP.O' ... 'TOUR.O' 'TWO.N' 'VRNS.O']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'VRNS.O' 'CALD.O' 'JLL.N']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'APTV.N' 'NVRO.N' 'SITE.N']
total 1816 df
['A.N' 'AA.N' 'AAAP.O' ... 'NVRO.N' 'SITE.N' 'QD.N']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'QD.N' 'PEGA.O' 'SPTN.O']
total 1812 df
['A.N' 'AA.N' 'AAAP.O' ... 'MULE.N' 'TPC.N' 'WLL.N']
total 1813 df
['A.N' 'AA.N' 'AAAP.O' ... 'GOLF.N' 'RDY.N' 'SE.N']
total 1815 df
['A.N' 'AA.N' 'AAAP.O' ... 'SE.N' 'CADE.N' 'KRNY.O']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'SE.N' 'CADE.N' 'KRNY.O']
total 1811 df
['A.N' 'AA.N' 'AAAP.O' ... 'FANH.O' 'LHCG.O' 'PETS.O']
total 1807 df
['A.N' 'AA.N' 'AAAP.O' ... 'LHCG.O' 'PETS.O' 'PSDO.O']
total 1808 df
['A.N' 'AA.N' 'AAAP.O' ... 'PFG.O' 'TLRD.N' 'WLH.N']
total 1809 df
['A.N' 'AA.N' 'AAAP.O' ... 'NCLH.N' 'PFS.N' 'UFPI.O']
total 1812 df
['A.N' 'AA.N' 'AAAP.O' ... 'PEP.O' 'RDSb.N' 'XNET.O']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'AQUA.N' 'NSIT.O' 'WOW.N']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'NSIT.O' 'WOW.N' 'MLHR.O']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'MLHR.O' 'CTMX.O' 'RYAM.N']
total 1815 df
['A.N' 'AA.N' 'AAAP.O' ... 'MLHR.O' 'CTMX.O' 'RYAM.N']
total 1810 df
['A.N' 'AA.N' 'AAAP.O' ... 'SAVE.N' 'SOGO.N' 'UBSH.O']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'LILKV.O' 'MEDP.O' 'PPDF.N']
total 1821 df
['A.N' 'AA.N' 'AAAP.O' ... 'NTR.N' 'TOO.N' 'XEL.O']
total 1825 df
['A.N' 'AA.N' 'AAAP.O' ... 'NCS.N' 'RVNC.O' 'WTTR.N']
total 1827 df
['A.N' 'AA.N' 'AAAP.O' ... 'ALV.N' 'CALM.O' 'OSIS.O']
total 1824 df
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['A.N' 'AA.N' 'AAAP.O' ... 'CALM.O' 'OSIS.O' 'GATX.N']
total 1817 df
['A.N' 'AA.N' 'AAAP.O' ... 'DHI.N' 'IMGN.O' 'SYNH.O']
total 1818 df
['A.N' 'AA.N' 'AAAP.O' ... 'IMGN.O' 'SYNH.O' 'HASI.N']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'CSGP.O' 'QGEN.N' 'STE.N']
total 1813 df
['A.N' 'AA.N' 'AAAP.O' ... 'STE.N' 'GGG.N' 'NDSN.O']
total 1803 df
['A.N' 'AA.N' 'AAAP.O' ... 'ATU.N' 'BRKL.O' 'IMPV.O']
total 1805 df
['A.N' 'AA.N' 'AAAP.O' ... 'OGS.N' 'VNOM.O' 'WP.N']
total 1811 df
['A.N' 'AA.N' 'AAAP.O' ... 'FDS.N' 'GES.N' 'ORAN.N']
total 1814 df
['A.N' 'AA.N' 'AAAP.O' ... 'ORAN.N' 'BABY.O' 'GTE.A']
total 1810 df
['A.N' 'AA.N' 'AAAP.O' ... 'CROX.O' 'HEI.N' 'SUN.N']
total 1807 df
['A.N' 'AA.N' 'AAAP.O' ... 'SUN.N' 'APOG.O' 'PDS.N']
total 1808 df
['A.N' 'AA.N' 'AAAP.O' ... 'APOG.O' 'PDS.N' 'GWB.N']
total 1800 df
['A.N' 'AA.N' 'AAAP.O' ... 'CRSP.O' 'DLPH.N' 'OKTA.O']
total 1800 df
['A.N' 'AA.N' 'AABA.O' ... 'CRSP.O' 'DLPH.N' 'OKTA.O']
total 1794 df
['A.N' 'AA.N' 'AABA.O' ... 'CRSP.O' 'DLPH.N' 'OKTA.O']
total 1792 df
['A.N' 'AA.N' 'AABA.O' ... 'CEIX.N' 'HII.N' 'LSTR.O']
total 1794 df
['A.N' 'AA.N' 'AABA.O' ... 'HOLI.O' 'IDA.N' 'SSW.N']
total 1793 df
['A.N' 'AA.N' 'AABA.O' ... 'INXN.N' 'KND.N' 'LFIN.O']
total 1792 df
['A.N' 'AA.N' 'AABA.O' ... 'AMG.N' 'TK.N' 'WCC.N']
total 1789 df
['A.N' 'AA.N' 'AABA.O' ... 'EURN.N' 'NHI.N' 'NMRK.O']
total 1792 df
['A.N' 'AA.N' 'AABA.O' ... 'KTWO.O' 'SAP.N' 'SCHN.O']
total 1798 df
['A.N' 'AA.N' 'AABA.O' ... 'LMNX.O' 'RCI.N' 'SASR.O']
total 1803 df
['A.N' 'AA.N' 'AABA.O' ... 'RCI.N' 'SASR.O' 'FTS.N']
total 1802 df
['A.N' 'AA.N' 'AABA.O' ... 'SBCF.O' 'TKC.N' 'WST.N']
total 1806 df
['A.N' 'AA.N' 'AABA.O' ... 'ICL.N' 'LII.N' 'MAIN.N']
total 1808 df
['A.N' 'AA.N' 'AABA.O' ... 'RHP.N' 'SUPV.N' 'WBC.N']
total 1820 df
['A.N' 'AA.N' 'AABA.O' ... 'ORBK.O' 'TEP.N' 'VC.O']
total 1818 df
['A.N' 'AA.N' 'AABA.O' ... 'AVYA.N' 'BGNE.O' 'CHU.N']
total 1821 df
['A.N' 'AA.N' 'AABA.O' ... 'CHU.N' 'ATKR.N' 'EVR.N']
total 1817 df
```

```
['A.N' 'AA.N' 'AABA.O' ... 'OEC.N' 'PTCT.O' 'SSL.N']
total 1820 df
['A.N' 'AA.N' 'AABA.O' ... 'SSL.N' 'ADMS.O' 'AWR.N']
total 1821 df
['A.N' 'AA.N' 'AABA.O' ... 'MNRO.O' 'RPD.O' 'SXT.N']
total 1826 df
['A.N' 'AA.N' 'AABA.O' ... 'MTH.N' 'RDY.N' 'SSD.N']
total 1829 df
['A.N' 'AA.N' 'AABA.O' ... 'CCMP.O' 'CWT.N' 'HUBG.O']
total 1829 df
['A.N' 'AA.N' 'AABA.O' ... 'ORBC.O' 'PCTY.O' 'RELX.N']
total 1833 df
['A.N' 'AA.N' 'AABA.O' ... 'CLH.N' 'MATX.N' 'WGL.N']
total 1838 df
['A.N' 'AA.N' 'AABA.O' ... 'CR.N' 'MCY.N' 'WELL.N']
total 1838 df
['A.N' 'AA.N' 'AABA.O' ... 'WELL.N' 'BDC.N' 'GNBC.O']
total 1837 df
['A.N' 'AA.N' 'AABA.O' ... 'LBRT.N' 'SR.N' 'VREX.O']
total 1842 df
['A.N' 'AA.N' 'AABA.O' ... 'RUSHA.O' 'SNHY.O' 'VIRT.O']
total 1849 df
['A.N' 'AA.N' 'AABA.O' ... 'VIRT.O' 'BANR.O' 'TTEK.O']
total 1848 df
['A.N' 'AA.N' 'AABA.O' ... 'JRVR.O' 'MLI.N' 'RBC.N']
total 1848 df
['A.N' 'AA.N' 'AABA.O' ... 'PSO.N' 'TEGP.N' 'VRTU.O']
total 1855 df
['A.N' 'AA.N' 'AABA.O' ... 'HSC.N' 'MB.O' 'MHO.N']
total 1857 df
['A.N' 'AA.N' 'AABA.O' ... 'POOL.O' 'SODA.O' 'WEB.O']
total 1862 df
['A.N' 'AA.N' 'AABA.O' ... 'WEB.O' 'AYR.N' 'VRNS.O']
total 1861 df
['A.N' 'AA.N' 'AABA.O' ... 'REI.A' 'TRUP.O' 'VRNT.O']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'SHLM.O' 'TGTX.O' 'VECO.O']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'VECO.O' 'BEL.N' 'FG.N']
total 1866 df
['A.N' 'AA.N' 'AABA.O' ... 'ENSG.O' 'HMY.N' 'PRIM.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'LZB.N' 'NCI.N' 'PRAA.O']
total 1874 df
['A.N' 'AA.N' 'AABA.O' ... 'SSTK.N' 'TYPE.O' 'VICI.N']
total 1878 df
['A.N' 'AA.N' 'AABA.O' ... 'FTSI.N' 'GHDX.O' 'HEES.O']
total 1876 df
['A.N' 'AA.N' 'AABA.O' ... 'TBPH.O' 'TK.N' 'WAIR.N']
total 1884 df
['A.N' 'AA.N' 'AABA.O' ... 'ITRI.O' 'NEWM.N' 'PGTI.N']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'GMLP.O' 'MGNX.O' 'SRG.N']
total 1893 df
['A.N' 'AA.N' 'AABA.O' ... 'RVNC.O' 'WAGE.N' 'XNCR.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'WAGE.N' 'XNCR.O' 'MMSI.O']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'MUEG.N' 'SAIC.N' 'VNDA.O']
```

```
[ A.N    AA.N    AABA.O  ...  MUFG.N   SAIC.N   VNDA.O ]
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'COLL.O' 'LPSN.O' 'TUSK.O']
total 1899 df
['A.N' 'AA.N' 'AABA.O' ... 'TUSK.O' 'NCS.N' 'RGNX.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'RGNX.O' 'SWX.N' 'TFX.N']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'SWX.N' 'TFX.N' 'AZUL.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'KANG.O' 'MRTX.O' 'PPDF.N']
total 1893 df
['A.N' 'AA.N' 'AABA.O' ... 'AYX.N' 'BHVN.N' 'MDGL.O']
total 1891 df
['A.N' 'AA.N' 'AABA.O' ... 'BHVN.N' 'MDGL.O' 'ADC.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'ADAP.O' 'AMWD.O' 'EYE.O']
total 1889 df
['A.N' 'AA.N' 'AABA.O' ... 'NEOG.O' 'OCFC.O' 'WOR.N']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'GCO.N' 'LX.O' 'SGH.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'CISN.N' 'GPI.N' 'TCP.N']
total 1898 df
['A.N' 'AA.N' 'AABA.O' ... 'ASX_w.N' 'CRON.O' 'FSCT.O']
total 1895 df
['A.N' 'AA.N' 'AABA.O' ... 'HOME.N' 'QIWI.O' 'STC.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'GWB.N' 'RUN.O' 'SASR.O']
total 1891 df
['A.N' 'AA.N' 'AABA.O' ... 'DM.N' 'PLXS.O' 'PRFT.O']
total 1894 df
['A.N' 'AA.N' 'AABA.O' ... 'PLXS.O' 'PRFT.O' 'BFAM.N']
total 1892 df
['A.N' 'AA.N' 'AABA.O' ... 'PLXS.O' 'PRFT.O' 'BFAM.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'CALM.O' 'FDS.N' 'KRNY.O']
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'NSIT.O' 'SODA.O' 'WD.N']
total 1890 df
['A.N' 'AA.N' 'AABA.O' ... 'LAD.N' 'LBRDA.O' 'SNX.N']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'SNX.N' 'FMX.N' 'SATS.O']
total 1894 df
['A.N' 'AA.N' 'AABA.O' ... 'MRTN.O' 'SCHN.O' 'SEND.N']
total 1898 df
['A.N' 'AA.N' 'AABA.O' ... 'SAIA.O' 'TKC.N' 'ZS.O']
total 1902 df
['A.N' 'AA.N' 'AABA.O' ... 'ZS.O' 'BAK.N' 'PSO.N']
total 1904 df
['A.N' 'AA.N' 'AABA.O' ... 'MUSA.N' 'QRTEA.O' 'WGL.N']
total 1906 df
['A.N' 'AA.N' 'AABA.O' ... 'AVT.O' 'GIL.N' 'SGRY.O']
total 1909 df
['A.N' 'AA.N' 'AABA.O' ... 'GIL.N' 'SGRY.O' 'AMC.N']
total 1908 df
['A.N' 'AA.N' 'AABA.O' ... 'ATR.N' 'DBX.O' 'ENLC.N']
total 1906 df
['A.N' 'AA.N' 'AABA.O' ... 'NXEO.O' 'VRNS.O' 'WBC.N']
```

```
['A.N'  'AA.N'  'AABA.O'  ...  'RACE.O'  'TRHC.O'  'RBSTO']
total 1913 df
['A.N'  'AA.N'  'AABA.O'  ...  'QURE.O'  'RACE.N'  'TRHC.O']
total 1914 df
['A.N'  'AA.N'  'AABA.O'  ...  'CCOI.O'  'NSP.N'  'ONE.N']
total 1917 df
['A.N'  'AA.N'  'AABA.O'  ...  'CPA.N'  'IQ.O'  'ROKU.O']
total 1918 df
['A.N'  'AA.N'  'AABA.O'  ...  'CW.N'  'LTC.N'  'RNR.N']
total 1917 df
['A.N'  'AA.N'  'AABA.O'  ...  'LTC.N'  'RNR.N'  'SCOR.OB']
total 1915 df
['A.N'  'AA.N'  'AABA.O'  ...  'JOE.N'  'MIME.O'  'SPOT.N']
total 1920 df
['A.N'  'AA.N'  'AABA.O'  ...  'SPOT.N'  'MDXG.O'  'TSG.O']
total 1918 df
['A.N'  'AA.N'  'AABA.O'  ...  'RMP.N'  'TX.N'  'WCC.N']
total 1920 df
['A.N'  'AA.N'  'AABA.O'  ...  'BFR.N'  'BTE.N'  'JEF.N']
total 1918 df
['A.N'  'AA.N'  'AABA.O'  ...  'KTWO.O'  'SUPV.N'  'TTEK.O']
total 1919 df
['A.N'  'AA.N'  'AABA.O'  ...  'AXGN.O'  'ENVA.N'  'VAC.N']
total 1921 df
['A.N'  'AA.N'  'AABA.O'  ...  'VAC.N'  'AROC.N'  'KMPR.N']
total 1917 df
['A.N'  'AA.N'  'AABA.O'  ...  'MEDP.O'  'MSGN.N'  'MTGE.O']
total 1918 df
['A.N'  'AA.N'  'AABA.O'  ...  'LOMA.N'  'PAM.N'  'WYND.N']
total 1910 df
['A.N'  'AA.N'  'AABA.O'  ...  'SSP.O'  'STNG.N'  'WBK.N']
total 1911 df
['A.N'  'AA.N'  'AABA.O'  ...  'PRA.N'  'RCM.O'  'WTI.N']
total 1912 df
['A.N'  'AA.N'  'AABA.O'  ...  'ENTA.O'  'RDY.N'  'TPIC.O']
total 1912 df
['A.N'  'AA.N'  'AABA.O'  ...  'DNB.N'  'EAF.N'  'NGL.N']
total 1907 df
['A.N'  'AA.N'  'AABA.O'  ...  'CLBK.O'  'MDR.N'  'PVTL.N']
total 1908 df
['A.N'  'AA.N'  'AABA.O'  ...  'BRKL.O'  'CHRS.O'  'NEO.O']
total 1909 df
['A.N'  'AA.N'  'AABA.O'  ...  'KPTI.O'  'STBZ.O'  'TEO.N']
total 1907 df
['A.N'  'AA.N'  'AABA.O'  ...  'KPTI.O'  'STBZ.O'  'TEO.N']
total 1903 df
['A.N'  'AA.N'  'AABA.O'  ...  'STBZ.O'  'TEO.N'  'CDAY.N']
total 1894 df
['A.N'  'AA.N'  'AABA.O'  ...  'PPDF.N'  'SITE.N'  'STAA.O']
total 1897 df
['A.N'  'AA.N'  'AABA.O'  ...  'OMER.O'  'PRIM.O'  'SRG.N']
total 1898 df
['A.N'  'AA.N'  'AABA.O'  ...  'PRIM.O'  'SRG.N'  'DDR.N']
total 1896 df
['A.N'  'AA.N'  'AABA.O'  ...  'SRG.N'  'DDR.N'  'FOSL.O']
total 1888 df
['A.N'  'AA.N'  'AABA.O'  ...  'FOSL.O'  'NOAH.N'  'PVAC.O']
total 1887 df
['A.N'  'AA.N'  'AABA.O'  ...  'CBLK.O'  'UVV.N'  'VNDA.O']
```

```
total 1887 df
['A.N' 'AA.N' 'AABA.O' ... 'LTRPA.O' 'RHP.N' 'VRNT.O']
total 1897 df
['A.N' 'AA.N' 'AABA.O' ... 'RHP.N' 'VRNT.O' 'STAY.O']
total 1896 df
['A.N' 'AA.N' 'AABA.O' ... 'EQH.N' 'FANH.O' 'MDGL.O']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'MDGL.O' 'HUYA.N' 'SMPL.O']
total 1861 df
['A.N' 'AA.N' 'AABA.O' ... 'GTHX.O' 'LZB.N' 'VSTO.N']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'IRTC.O' 'TCMD.O' 'TGE.N']
total 1872 df
['A.N' 'AA.N' 'AABA.O' ... 'TGE.N' 'DXC.N' 'HLI.N']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'GWB.N' 'NCS.N' 'PS.O']
total 1870 df
['A.N' 'AA.N' 'AABA.O' ... 'PS.O' 'BHLB.N' 'CVNA.N']
total 1862 df
['A.N' 'AA.N' 'AABA.O' ... 'MDB.O' 'MLHR.O' 'WH.N']
total 1869 df
['A.N' 'AA.N' 'AABA.O' ... 'MDB.O' 'MLHR.O' 'WH.N']
total 1865 df
['A.N' 'AA.N' 'AABA.O' ... 'RACE.N' 'SAIA.O' 'TREE.O']
total 1867 df
['A.N' 'AA.N' 'AABA.O' ... 'GSKY.O' 'JWa.N' 'PRSP.N']
total 1860 df
['A.N' 'AA.N' 'AABA.O' ... 'BHE.N' 'BHVN.N' 'FCB.N']
total 1862 df
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and it finishes running, you can submit the file to the competition
from the Kernel Viewer `Output` tab.


-----------------------------------------------------------------
--------
FileNotFoundError                         Traceback (most recent ca
ll last)
<ipython-input-17-2d129e70feaf> in <module>()
     42
     43 env.write_submission_file()
---> 44 sub  = pd.read_csv("submission_versionnew.csv")


/opt/conda/lib/python3.6/site-packages/pandas/io/parsers.py in pars
er_f(filepath_or_buffer, sep, delimiter, header, names, index_col,
 usecols, squeeze, prefix, mangle_dupe_cols, dtype, engine, convert
ers, true_values, false_values, skipinitialspace, skiprows, nrows,
 na_values, keep_default_na, na_filter, verbose, skip_blank_lines,
 parse_dates, infer_datetime_format, keep_date_col, date_parser, da
yfirst, iterator, chunksize, compression, thousands, decimal, linet
erminator, quotechar, quoting, escapechar, comment, encoding, diale
ct, tupleize_cols, error_bad_lines, warn_bad_lines, skipfooter, dou
blequote, delim_whitespace, low_memory, memory_map, float_precisio
n)
    676                           skip_blank_lines=skip_blank_lines)
    677
```

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