In [1]:
```python
%load_ext autoreload
%autoreload 2

import numpy as np
import numpy.random as nprd
import numpy.linalg as npla
import matplotlib.pyplot as plt
import pandas as pd
from pandas.plotting import bootstrap_plot
import statsmodels.api as sm
from feature_selection import FeatureSelection as fs
```

Get rid of useless data and change string into computable datatype

In [2]:
```python
data = pd.read_csv("companies_years_2009_2020_p4_v1_total.csv")
data_new = data.drop(columns = ['exchange', 'href', 'company_address', 'phone', 'compan
tag = data_new.columns
data_new['date_of_priced'] = pd.to_datetime(data_new['date_of_priced'])
change_tag = ['dollar_value_of_shares','shares_offered', 'shares_outstanding','1','2','
for idx in change_tag:
    data_new.update(data_new[idx].str.replace(r'\$', ''))
    data_new.update(data_new[idx].str.replace(r'\,', '').astype(float))
data_new[['shares_offered','dollar_value_of_shares','shares_outstanding']] = data_new[[
```

```
<ipython-input-2-6b044e80b2bd>:7: FutureWarning: The default value of regex will change
from True to False in a future version.
  data_new.update(data_new[idx].str.replace(r'\$', ''))
<ipython-input-2-6b044e80b2bd>:8: FutureWarning: The default value of regex will change
from True to False in a future version.
  data_new.update(data_new[idx].str.replace(r'\,', '').astype(float))
```

Replace all 0 in week 1,2,3,4,5 with null

In [3]:
```python
data_new[['1','2','3','4','5']] = data_new[['1','2','3','4','5']].replace(0 ,np.nan)
data_new['date_of_priced'] = pd.to_datetime(data_new['date_of_priced'])
data_new.isnull().sum()
```

Out[3]:
```
share_price               0
shares_offered            0
dollar_value_of_shares    0
date_of_priced            0
employees                 0
shares_outstanding        0
stock_valuation           0
sicdescription            0
ebit                      0
grossprofit               0
netincome                 0
totalrevenue              0
costofrevenue             0
totalassets               0
revenue_growth            0
1                        44
2                        44
```
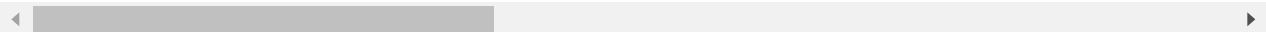
```
3                      44
4                      44
5                      44
dtype: int64
```

Delete all null data

In [4]:
```
data_nonzero = data_new[~(data_new['1'].isnull()) ]
data_nonzero.to_csv("ClearedData_deleteNulls.csv",index = False)
data_nonzero
```

Out[4]:

	share_price	shares_offered	dollar_value_of_shares	date_of_priced	employees	shares_outstanding
0	10.5	13500000.0	1.417500e+08	2009-04-15	2971	53139723.0
1	6.0	1700000.0	1.020000e+07	2009-07-30	96	3951811.0
2	17.0	5000000.0	8.500000e+07	2009-08-11	59	17091191.0
3	10.0	30000000.0	3.000000e+08	2009-09-25	21700	156092873.0
4	14.0	5700000.0	7.980000e+07	2009-10-02	553	21493655.0
...	...	...	...	...	...	...
445	10.5	58750000.0	6.168750e+08	2020-11-19	3355	58750000.0
446	27.0	60000000.0	1.620000e+09	2020-11-20	390	88965664.0
447	23.0	46600000.0	1.071800e+09	2020-11-20	2900	277431755.0
448	10.0	2400000.0	2.400000e+07	2020-11-24	14	7577677.0
449	30.0	33000000.0	9.900000e+08	2020-11-24	13432	179230154.0

406 rows × 20 columns

In [5]:
```python
data_cal = data_nonzero.drop(columns = ['date_of_priced', 'sicdescription'])
target = data_nonzero[['1','2','3','4','5']]
tag = ['1','2','3','4','5']

print("Features selected by forward selection for week 1:", fs.forward_selection(data_c
print("Features selected by forward selection for week 2:", fs.forward_selection(data_c
print("Features selected by forward selection for week 3:", fs.forward_selection(data_c
print("Features selected by forward selection for week 4:", fs.forward_selection(data_c
print("Features selected by forward selection for week 5:", fs.forward_selection(data_c
print("\n")
print("Features selected by forward selection for week 1:", fs.forward_selection(data_c
print("Features selected by forward selection for week 2:", fs.forward_selection(data_c
print("Features selected by forward selection for week 3:", fs.forward_selection(data_c
print("Features selected by forward selection for week 4:", fs.forward_selection(data_c
print("Features selected by forward selection for week 5:", fs.forward_selection(data_c
print("\n")
print("Features selected by backward elimination for week 1:", fs.backward_elimination(
print("Features selected by backward elimination for week 2:", fs.backward_elimination(
print("Features selected by backward elimination for week 3:", fs.backward_elimination(
print("Features selected by backward elimination for week 4:", fs.backward_elimination(
print("Features selected by backward elimination for week 5:", fs.backward_elimination(
print("\n")
print("Features selected by backward elimination for week 1:", fs.backward_elimination(
print("Features selected by backward elimination for week 2:", fs.backward_elimination(
print("Features selected by backward elimination for week 3:", fs.backward_elimination(
print("Features selected by backward elimination for week 4:", fs.backward_elimination(
print("Features selected by backward elimination for week 5:", fs.backward_elimination(
```

```
Features selected by forward selection for week 1: ['share_price']
Features selected by forward selection for week 2: ['1']
Features selected by forward selection for week 3: ['2', '1', 'share_price', 'dollar_val
ue_of_shares']
Features selected by forward selection for week 4: ['1', '3', '2']
Features selected by forward selection for week 5: ['1', '4', '2', '3']


Features selected by forward selection for week 1: ['share_price']
Features selected by forward selection for week 2: []
Features selected by forward selection for week 3: ['share_price']
Features selected by forward selection for week 4: ['share_price']
Features selected by forward selection for week 5: ['share_price']


Features selected by backward elimination for week 1: ['share_price']
Features selected by backward elimination for week 2: ['1' 'netincome' 'dollar_value_of_
shares' 'shares_outstanding'
 'shares_offered' 'share_price' 'totalassets' 'costofrevenue'
 'stock_valuation' 'employees' 'totalrevenue' 'ebit']
Features selected by backward elimination for week 3: ['2' '1' 'share_price' 'dollar_val
ue_of_shares']
Features selected by backward elimination for week 4: ['3' '1' '2']
Features selected by backward elimination for week 5: ['4' '1' '2' '3' 'shares_outstandi
ng' 'dollar_value_of_shares'
 'totalassets']


Features selected by backward elimination for week 1: ['share_price']
Features selected by backward elimination for week 2: ['share_price']
Features selected by backward elimination for week 3: ['share_price']
Features selected by backward elimination for week 4: ['share_price']
Features selected by backward elimination for week 5: ['share_price']
```

In [6]:

```
X = data_cal.drop(columns = ['1','2','3','4','5'])
X = sm.add_constant(X)
y = (data_cal['5'] - data_cal['share_price'])/ data_cal['share_price']
model = sm.OLS(y,X)
result = model.fit();
print(result.summary())
plt.plot(data_cal['share_price'],y,'x', label = 'data' )
a = result.params['share_price']
b = result.params['const']
plt.plot(data_cal['share_price'], data_cal['share_price'] * a + b, label = 'prox' )
plt.xlabel("share_price")
plt.ylabel("(day5 - share_price)/share_price")
```

```
                          OLS Regression Results
================================================================================
==
Dep. Variable:                     y    R-squared:                       0.087
Model:                           OLS    Adj. R-squared:                  0.057
Method:                Least Squares    F-statistic:                     2.870
Date:               Tue, 27 Apr 2021    Prob (F-statistic):           0.000567
Time:                       20:11:40    Log-Likelihood:                 -1348.5
No. Observations:                406    AIC:                             2725.
Df Residuals:                    392    BIC:                             2781.
Df Model:                         13
Covariance Type:            nonrobust
================================================================================
==
                          coef    std err          t      P>|t|      [0.025      0.97
5]
--------------------------------------------------------------------------------
--
const                   1.0110      0.959      1.055      0.292     -0.874       2.8
96
share_price             0.0081      0.061      0.134      0.893     -0.111       0.1
27
shares_offered       -3.058e-08   2.85e-08     -1.075      0.283   -8.65e-08     2.54e-
08
dollar_value_of_shares 1.211e-09   7.97e-10      1.519      0.130   -3.57e-10     2.78e-
09
employees             6.248e-06   2.49e-05      0.251      0.802   -4.27e-05     5.52e-
05
shares_outstanding    2.998e-08   5.63e-09      5.325      0.000    1.89e-08      4.1e-
08
stock_valuation      -9.691e-10   2.75e-10     -3.521      0.000   -1.51e-09    -4.28e-
10
ebit                 -5.212e-09   2.67e-09     -1.952      0.052   -1.05e-08     3.66e-
11
grossprofit           1.054e-06   4.66e-06      0.226      0.821   -8.11e-06     1.02e-
05
netincome             1.098e-09   3.45e-09      0.319      0.750   -5.68e-09     7.87e-
09
totalrevenue         -1.053e-06   4.66e-06     -0.226      0.821   -1.02e-05     8.11e-
06
costofrevenue         1.053e-06   4.66e-06      0.226      0.821   -8.11e-06     1.02e-
05
totalassets          -2.031e-10   2.02e-10     -1.005      0.315      -6e-10     1.94e-
10
revenue_growth         -0.0022      0.004     -0.522      0.602     -0.010       0.0
06
================================================================================
==
Omnibus:                     622.932    Durbin-Watson:                   1.849
Prob(Omnibus):                 0.000    Jarque-Bera (JB):           142500.790
Skew:                          8.256    Prob(JB):                         0.00
Kurtosis:                     93.283    Cond. No.                     1.85e+10
================================================================================
```
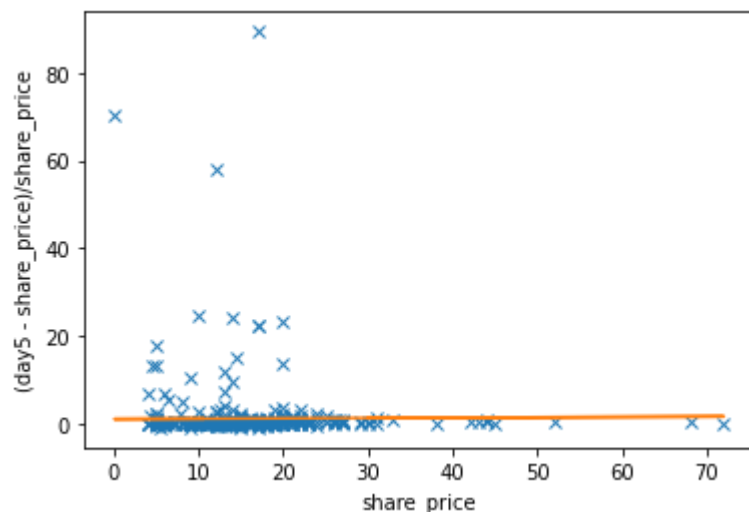
Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.85e+10. This might indicate that there are strong multicollinearity or other numerical problems.

Out[6]: Text(0, 0.5, '(day5 - share_price)/share_price')

In [7]:
```
X = data_cal.drop(columns = ['1','2','3','4','5'])
X = sm.add_constant(X)
y = (data_cal['5'] - data_cal['share_price'])
model = sm.OLS(y,X)
result = model.fit();
print(result.summary())
plt.plot(data_cal['share_price'],y,'x', label = 'data' )
a = result.params['share_price']
b = result.params['const']
plt.plot(data_cal['share_price'], data_cal['share_price'] * a + b, label = 'prox' )
plt.xlabel("share_price")
plt.ylabel("day5 - share_price")
```

                          OLS Regression Results
==
Dep. Variable: y   R-squared: 0.010
Model: OLS   Adj. R-squared: -0.023
Method: Least Squares   F-statistic: 0.3125
Date: Tue, 27 Apr 2021   Prob (F-statistic):   0.990
Time: 20:11:40   Log-Likelihood: -2419.4
No. Observations: 406   AIC: 4867.
Df Residuals: 392   BIC: 4923.
Df Model: 13
Covariance Type: nonrobust
==
                    coef   std err   t   P>|t| [0.025   0.975]
----
const   13.2026   13.402   0.985   0.325   -13.145   39.551
share_price   0.4821   0.849   0.568   0.570   -1.186   2.150
shares_offered -3.943e-07   3.98e-07   -0.991   0.322   -1.18e-06   3.88e-07

dollar_value_of_shares	6.443e-09	1.11e-08	0.578	0.564	-1.55e-08	2.84e-08
employees	8.356e-05	0.000	0.240	0.810	-0.001	0.001
shares_outstanding	8.89e-08	7.87e-08	1.130	0.259	-6.58e-08	2.44e-07
stock_valuation	-9.798e-10	3.85e-09	-0.255	0.799	-8.55e-09	6.59e-09
ebit	7.219e-11	3.73e-08	0.002	0.998	-7.33e-08	7.35e-08
grossprofit	7.606e-06	6.51e-05	0.117	0.907	-0.000	0.000
netincome	-2.364e-08	4.82e-08	-0.491	0.624	-1.18e-07	7.11e-08
totalrevenue	-7.604e-06	6.51e-05	-0.117	0.907	-0.000	0.000
costofrevenue	7.602e-06	6.51e-05	0.117	0.907	-0.000	0.000
totalassets	-2.106e-09	2.82e-09	-0.746	0.456	-7.66e-09	3.45e-09
revenue_growth	-0.0120	0.058	-0.207	0.836	-0.126	0.102

```
==============================================================================
Omnibus:                      754.732   Durbin-Watson:               1.701
Prob(Omnibus):                  0.000   Jarque-Bera (JB):       487682.735
Skew:                          11.723   Prob(JB):                     0.00
Kurtosis:                     171.163   Cond. No.                 1.85e+10
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specifi
ed.
[2] The condition number is large, 1.85e+10. This might indicate that there are
strong multicollinearity or other numerical problems.
```
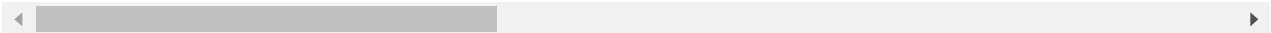
Out[7]: Text(0, 0.5, 'day5 - share_price')
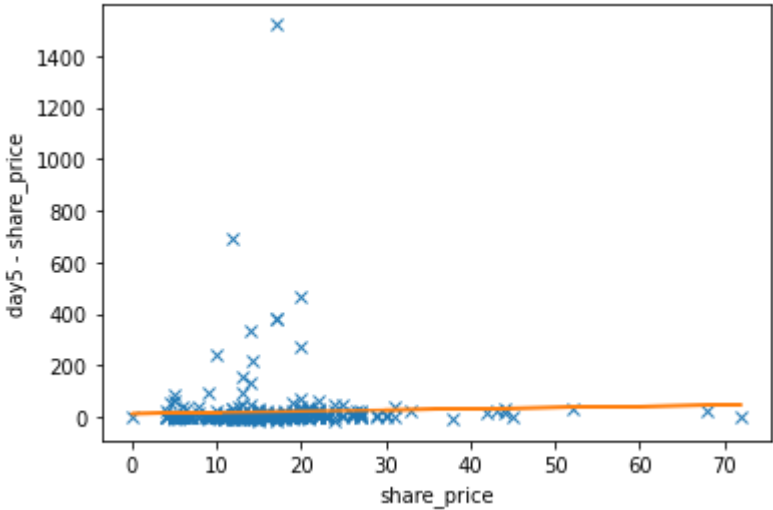
In [8]:
```python
#DBSCAN work
data_nonzero
```

Out[8]:

	share_price	shares_offered	dollar_value_of_shares	date_of_priced	employees	shares_outstanding
0	10.5	13500000.0	1.417500e+08	2009-04-15	2971	53139723.0

	share_price	shares_offered	dollar_value_of_shares	date_of_priced	employees	shares_outstanding
1	6.0	1700000.0	1.020000e+07	2009-07-30	96	3951811.0
2	17.0	5000000.0	8.500000e+07	2009-08-11	59	17091191.0
3	10.0	30000000.0	3.000000e+08	2009-09-25	21700	156092873.0
4	14.0	5700000.0	7.980000e+07	2009-10-02	553	21493655.0
...	...	...	...	...	...	...
445	10.5	58750000.0	6.168750e+08	2020-11-19	3355	58750000.0
446	27.0	60000000.0	1.620000e+09	2020-11-20	390	88965664.0
447	23.0	46600000.0	1.071800e+09	2020-11-20	2900	277431755.0
448	10.0	2400000.0	2.400000e+07	2020-11-24	14	7577677.0
449	30.0	33000000.0	9.900000e+08	2020-11-24	13432	179230154.0

406 rows × 20 columns

In [9]:
```python
day_prices = data_nonzero[['1','2','3','4','5']]
print(day_prices)
#day_prices = day_prices.drop('percent_change_after_day_1')
print(day_prices)
```

```
         1      2       3      4      5
0    11.10  12.05  12.010  11.65  11.00
1    27.85  29.75  32.350  37.05  45.70
2    16.83  17.00  17.045  17.01  16.80
3    10.09  10.45  10.090  10.07  10.00
4    14.06  14.00  14.000  13.51  12.98
..     ...    ...     ...    ...    ...
445  18.40  20.03  18.240  17.15  16.86
446  29.85  29.00  26.290  26.96  29.16
447  25.10  27.95  27.000  26.76  27.97
448  14.44  14.21  14.120  13.15  12.79
449  40.18  39.01  40.000  40.02  40.19
```

```
[406 rows x 5 columns]
          1      2       3      4      5
0     11.10  12.05  12.010  11.65  11.00
1     27.85  29.75  32.350  37.05  45.70
2     16.83  17.00  17.045  17.01  16.80
3     10.09  10.45  10.090  10.07  10.00
4     14.06  14.00  14.000  13.51  12.98
..      ...    ...     ...    ...    ...
445   18.40  20.03  18.240  17.15  16.86
446   29.85  29.00  26.290  26.96  29.16
447   25.10  27.95  27.000  26.76  27.97
448   14.44  14.21  14.120  13.15  12.79
449   40.18  39.01  40.000  40.02  40.19

[406 rows x 5 columns]
```

In [10]:
```python
#convert to
df = day_prices
df["1"] = pd.to_numeric(df["1"]).copy()
df["2"] = pd.to_numeric(df["2"]).copy()
df["3"] = pd.to_numeric(df["3"]).copy()
df["4"] = pd.to_numeric(df["4"]).copy()
df["5"] = pd.to_numeric(df["5"]).copy()
print(df)
```

```
          1      2       3      4      5
0     11.10  12.05  12.010  11.65  11.00
1     27.85  29.75  32.350  37.05  45.70
2     16.83  17.00  17.045  17.01  16.80
3     10.09  10.45  10.090  10.07  10.00
4     14.06  14.00  14.000  13.51  12.98
..      ...    ...     ...    ...    ...
445   18.40  20.03  18.240  17.15  16.86
446   29.85  29.00  26.290  26.96  29.16
447   25.10  27.95  27.000  26.76  27.97
448   14.44  14.21  14.120  13.15  12.79
449   40.18  39.01  40.000  40.02  40.19

[406 rows x 5 columns]
<ipython-input-10-0d6a9d20f874>:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
guide/indexing.html#returning-a-view-versus-a-copy
  df["1"] = pd.to_numeric(df["1"]).copy()
<ipython-input-10-0d6a9d20f874>:4: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
guide/indexing.html#returning-a-view-versus-a-copy
  df["2"] = pd.to_numeric(df["2"]).copy()
<ipython-input-10-0d6a9d20f874>:5: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
guide/indexing.html#returning-a-view-versus-a-copy
  df["3"] = pd.to_numeric(df["3"]).copy()
<ipython-input-10-0d6a9d20f874>:6: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
```

```
          Try using .loc[row_indexer,col_indexer] = value instead

          See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
          guide/indexing.html#returning-a-view-versus-a-copy
            df["4"] = pd.to_numeric(df["4"]).copy()
          <ipython-input-10-0d6a9d20f874>:7: SettingWithCopyWarning:
          A value is trying to be set on a copy of a slice from a DataFrame.
          Try using .loc[row_indexer,col_indexer] = value instead

          See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
          guide/indexing.html#returning-a-view-versus-a-copy
            df["5"] = pd.to_numeric(df["5"]).copy()
```

In [11]:
```python
#subtract =
df_1 = df
changes_day_1 = (df["2"]-df["1"]) / df["1"] * 100
changes_day_2 = (df["3"]-df["2"]) / df["2"] * 100
changes_day_3 = (df["4"]-df["3"]) / df["3"] * 100
changes_day_4 = (df["5"]-df["4"]) / df["4"] * 100
print(changes_day_1)
```

```
0       8.558559
1       6.822262
2       1.010101
3       3.567889
4      -0.426743
          ...
445     8.858696
446    -2.847571
447    11.354582
448    -1.592798
449    -2.911896
Length: 406, dtype: float64
```

In [12]:
```python
#assign dataframe
df_1 = df_1.assign(a=changes_day_1.values)
print(df_1)
df = df.assign(day_1_change = changes_day_1.values)
df = df.assign(day_2_change = changes_day_2.values)
df = df.assign(day_3_change = changes_day_3.values)
df = df.assign(day_4_change = changes_day_4.values)

print(df)
```

```
         1      2       3      4      5          a
0    11.10  12.05  12.010  11.65  11.00   8.558559
1    27.85  29.75  32.350  37.05  45.70   6.822262
2    16.83  17.00  17.045  17.01  16.80   1.010101
3    10.09  10.45  10.090  10.07  10.00   3.567889
4    14.06  14.00  14.000  13.51  12.98  -0.426743
..     ...    ...     ...    ...    ...        ...
445  18.40  20.03  18.240  17.15  16.86   8.858696
446  29.85  29.00  26.290  26.96  29.16  -2.847571
447  25.10  27.95  27.000  26.76  27.97  11.354582
448  14.44  14.21  14.120  13.15  12.79  -1.592798
449  40.18  39.01  40.000  40.02  40.19  -2.911896

[406 rows x 6 columns]
         1      2       3      4      5  day_1_change  day_2_change  \
0    11.10  12.05  12.010  11.65  11.00      8.558559     -0.331950
1    27.85  29.75  32.350  37.05  45.70      6.822262      8.739496
2    16.83  17.00  17.045  17.01  16.80      1.010101      0.264706
```

```
3    10.09  10.45  10.090  10.07  10.00      3.567889     -3.444976
4    14.06  14.00  14.000  13.51  12.98     -0.426743      0.000000
..   ...    ...    ...     ...    ...        ...           ...
445  18.40  20.03  18.240  17.15  16.86      8.858696     -8.936595
446  29.85  29.00  26.290  26.96  29.16     -2.847571     -9.344828
447  25.10  27.95  27.000  26.76  27.97     11.354582     -3.398927
448  14.44  14.21  14.120  13.15  12.79     -1.592798     -0.633357
449  40.18  39.01  40.000  40.02  40.19     -2.911896      2.537811

     day_3_change  day_4_change
0       -2.997502     -5.579399
1       14.528594     23.346829
2       -0.205339     -1.234568
3       -0.198216     -0.695134
4       -3.500000     -3.923020
..         ...           ...
445     -5.975877     -1.690962
446      2.548498      8.160237
447     -0.888889      4.521674
448     -6.869688     -2.737643
449      0.050000      0.424788

[406 rows x 9 columns]
```

In [78]:
```python
A = data_nonzero.drop(columns = ['1','2','3','4','5', 'date_of_priced'])
#A = A.drop('percent_change_after_day_1')
A = A.assign(day_1_change = changes_day_1.values)
A = A.assign(day_2_change = changes_day_2.values)
A = A.assign(day_3_change = changes_day_3.values)
A = A.assign(day_4_change = changes_day_4.values)
A
```

Out[78]:

	share_price	shares_offered	dollar_value_of_shares	employees	shares_outstanding	stock_valuation
0	10.5	13500000.0	1.417500e+08	2971	53139723.0	5.579671e+08
1	6.0	1700000.0	1.020000e+07	96	3951811.0	2.371087e+07
2	17.0	5000000.0	8.500000e+07	59	17091191.0	2.905502e+08
3	10.0	30000000.0	3.000000e+08	21700	156092873.0	1.560929e+09
4	14.0	5700000.0	7.980000e+07	553	21493655.0	3.009112e+08
...	...	...	...	...	...	...
445	10.5	58750000.0	6.168750e+08	3355	58750000.0	6.168750e+08

	share_price	shares_offered	dollar_value_of_shares	employees	shares_outstanding	stock_valuation
446	27.0	60000000.0	1.620000e+09	390	88965664.0	2.402073e+09
447	23.0	46600000.0	1.071800e+09	2900	277431755.0	6.380930e+09
448	10.0	2400000.0	2.400000e+07	14	7577677.0	7.577677e+07
449	30.0	33000000.0	9.900000e+08	13432	179230154.0	5.376905e+09

406 rows × 18 columns
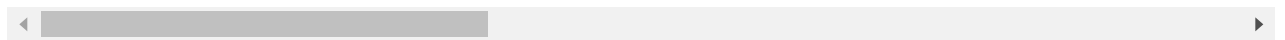
In [79]:
```python
# Using readlines()
file1 = open('codes.txt', 'r')
Lines = file1.readlines()


def classify_sic(number, sic):
    print("classify number " + str(number))
    if (number <= 999):
        # Agriculture, Forestry and Fishing
        return 0
    elif (number <= 1499):
        # Mining
        return 1
    elif (number <= 1799):
        #Construction
        return 2
    elif (number <= 1999):
        return -1
    elif (number <= 3999):
        return 3
    elif (number <= 4999):
        return 4
    elif (number <= 5199):
        return 5
    elif (number <= 5999):
        return 6
    elif (number <= 6799):
        return 7
    elif (number <= 8999):
        return 8
    elif (number <= 9729):
        return 9
    elif (number <= 9999):
        return 10

    #      0 Agriculture, Forestry and Fishing
    #      1 Mining
    #      2 Construction
```

```python
#       3 Manufacturing
#       4 Transportation, Communications, Electric, Gas and Sanitary service
#       5 Wholesale Trade
#       6 Retail Trade
#       7 Finance, Insurance and Real Estate
#       8 Services
#       9 Public Administration
#       10 Nonclassifiable
# 11 medical
# 12 education
# 13 (tech)/computer related/ engineering

#       -1 not used



if(sic=='Services-Educational Services'):
    return 12

elif(sic=='Oil and Gas Field Services, Not Elsewhere Classified'):
    return 4

elif(sic=='Pharmaceutical Preparations'):
    return 11

elif(sic=='Services-Hospitals'):
    return 11

elif(sic=='Arrangement of Transportation of Freight and Cargo'):
    return 4

elif(sic=='Services-Computer Processing and Data Preparation'):
    return 13

elif(sic=='Services-Engineering Services'):
    return 13

elif(sic=='Radio and Television Broadcasting and Communications Equipment'):
    return 13

elif(sic=='Services-Home Health Care Services'):
    return 11

elif(sic=='Hotels and Motels'):
    return 7

elif(sic=='Unsupported Plastics Film and Sheet'):
    return 3

elif(sic=='Retail-Variety Stores'):
    return 6

elif(sic=='Computer Peripheral Equipment, Not Elsewhere Classified'):
    return 13

elif(sic=='Wholesale-Petroleum Bulk Stations and Terminals'):
    return 4

elif(sic=='Industrial Instruments for Measurement, Display, and Control of Process 
    return 13
elif(sic=='Communications Services, Not Elsewhere Classified'):
```

```python
        return 4
    elif(sic=='Semiconductors and Related Devices'):
        return 13

    elif(sic=='Services-Prepackaged Software'):
        return 13

    elif(sic=='Industrial Organic Chemicals'):
        return 3

    elif(sic=='Construction Machinery and Equipment'):
        return 2

    elif(sic=='Retail-Apparel and Accessory Stores'):
        return 6

    elif(sic=='Surgical and Medical Instruments and Apparatus'):
        return 11

    elif(sic=='Security and Commodity Brokers, Dealers, Exchanges and Services'):
        return 7

    elif(sic=='Telephone and Telegraph Apparatus'):
        return 13

    elif(sic=='Motor Vehicles and Passenger Car Bodies'):
        return 13

    elif(sic=='PConstruction-Special Trade Contractors'):
        return 8

    elif(sic=='Construction-Special Trade Contractors'):
        return 2

    elif(sic=='Services-Business Services, Not Elsewhere Classified'):
        return 8

    elif(sic=='Transportation services'):
        return 4

    elif(sic=='Electromedical and Electrotherapeutic Apparatus'):
        return 13

    elif(sic=='Real Estate Investment Trusts'):
        return 7

    elif(sic=='Agricultural Production-Crops'):
        return 0

    elif(sic=='Services-General Medical and Surgical Hospitals, Not Elsewhere Classifie
        return 11

    elif(sic=='Services-Advertising Agencies'):
        return 8

    elif(sic=='Investment Advice'):
        return 7

    elif(sic=='Crude Petroleum and Natural Gas'):
        return 4
```

```python
    elif(sic=='Services-Personal Services'):
        return 8

    elif(sic=='Motor Vehicle Parts and Accessories'):
        return 13

    elif(sic=='Cut Stone and Stone Products'):
        return 2

    elif(sic=='Natural Gas Transmission'):
        return 4

    elif(sic=='Retail-Catalog and Mail-Order Houses'):
        return 7

    elif(sic=='Communications Equipment, Not Elsewhere Classified'):
        return 13

    elif(sic=='General Industrial Machinery And Equipment'):
        return 13

    elif(sic=='Water transportation'):
        return 4

    elif(sic=='Services-Computer Programming, Data Processing, Etc.'):
        return 13

    elif(sic=='Retail-Eating Places'):
        return 6

    elif(sic=='Retail-Grocery Stores'):
        return 6

    elif(sic=='Industrial Inorganic Chemicals'):
        return 3

    elif(sic=='Plastics Products, Not Elsewhere Classified'):
        return 3

    elif(sic=="Real Estate Agents and Managers (For Others)"):
        return 7

    elif(sic=="Petroleum Refining"):
        return 4

    elif(sic=="Services-Child Day Care Services"):
        return 8

    elif(sic=="Operative Builders"):
        return 7

    elif(sic=="Wholesale-Lumber and Other Construction Materials"):
        return 5

    elif(sic=="Printing Trades Machinery and Equipment"):
        return 13

    elif(sic=="Services-Miscellaneous Amusement and Recreation"):
        return 8

    elif(sic=="Real estate"):
```

```python
        return 7

    elif(sic=="Secondary Smelting and Refining of Nonferrous Metals"):
        return 3

    elif(sic=="Agricultural Chemicals"):
        return 0

    elif(sic=="Motorcycles, Bicycles and Parts"):
        return 13

    elif(sic=="Retail-Department Stores"):
        return 6

    elif(sic=="Services-Medical Laboratories"):
        return 11

    elif(sic=="Retail-Home Furniture, Furnishings and Equipment Stores"):
        return 6

    elif(sic=="Books: Publishing, or Publishing and Printing"):
        return 8
    elif(sic=="Electrical Industrial Apparatus"):
        return 13

    elif(sic=="Services-Motion Picture Theaters"):
        return 8

    elif(sic=="Computer Communications Equipment"):
        return 13

    elif(sic=="Plastic Materials, Synthetic Resins and Nonvulcan Elastomers"):
        return 13

    elif(sic=="Photographic Equipment and Supplies"):
        return 13

    elif(sic=="Retail-Hobby, Toy and Game Shops"):
        return 6

    elif(sic=="Hospital and Medical Service Plans"):
        return 12

    elif(sic=="Radio Broadcasting Stations"):
        return 13

    elif(sic=="Miscellaneous Chemical Products"):
        return 4

    elif(sic=="Plastics Foam Products"):
        return l3

    elif(sic=="Electric and Other Services Combined"):
        return 13

    elif(sic=="Wholesale-Metals Service Centers and Offices"):
        return 5

    elif(sic=="Drilling Oil and Gas Wells"):
        return 4
```

```python
        elif(sic=="Orthopedic, Prosthetic, and Surgical Appliances and Supplies"):
            return 11

        elif(sic=="Grain Mill Products"):
            return 3

        elif(sic=="Paints, Varnishes, Lacquers, Enamels and Allied Prods"):
            return 2

        elif(sic=="Services-Offices and Clinics Of Doctors Of Medicine"):
            return 11
        elif(sic=="Services-Management Services"):
            return 8

        elif(sic=="Ship And Boat Building And Repairing"):
            return 4

        elif(sic=="Patent Owners and Lessors"):
            return 9

        elif(sic=="Miscellaneous Electrical Machinery, Equipment and Supplies"):
            return 13

        elif(sic=="Electronic Components, Not Elsewhere Classified"):
            return 13
        elif(sic=="Engines And Turbines"):
            return 13
        elif(sic=="Services-Commercial Physical and Biological Research"):
            return 11
        elif(sic=="Perfumes, Cosmetics and Other Toilet Preparations"):
            return 6
        elif(sic=="Mining and Quarrying Of Nonmetallic Minerals (No Fuels)"):
            return 1
        elif(sic=="Real Estate Operators (No Developers) and Lessors"):
            return 7
        elif(sic=="Women's, Misses', and Juniors' Outerwear"):
            return 13
        elif(sic=="Glass Containers"):
            return 3
        elif(sic=="Finance Services"):
            return 7

        elif(sic=="Trucking (No Local)"):
            return 4

        elif(sic=="Bituminous Coal And Lignite Mining"):
            return 1
        elif(sic=="Retail-Lumber and Other Building Materials Dealers"):
            return 6
        elif(sic=="Retail-Auto Dealers and Gasoline Stations"):
            return 6
        elif(sic=="Wholesale-Drugs, Proprietaries and Druggists' Sundries"):
            return 11
        elif(sic=="Sanitary Services"):
            return 4

        elif(sic=="Miscellaneous Fabricated Metal Products"):
            return 3

        elif(sic=="Food and kindred products"):
            return 6
```

```python
    elif(sic=="Retail-Retail Stores, Not Elsewhere Classified"):
        return 6

    elif(sic=="Cable and Other Pay Television Services"):
        return 13

    elif(sic=="Chemicals and Allied Products"):
        return 3

    elif(sic=="Cement, Hydraulic"):
        return 2

    elif(sic=="Games, Toys and Children's Vehicles (No Dolls and Bicycles)"):
        return 6

    elif(sic=="Refrigeration And Service Industry Machinery"):
        return 13

    elif(sic=="Special Industry Machinery, Not Elsewhere Classified"):
        return 13


    elif(sic=="Services-Computer Programming Services"):
        return 13

    elif(sic=="Abrasive, Asbestos and Miscellaneous Nonmetallic Mineral Products"):
        return 3

    elif(sic=="Heavy Construction Other Than Bldg Const - Contractors"):
        return 2


    elif(sic=="Hazardous Waste Management"):
        return 4

    elif(sic=="Services-Auto Rental and Leasing (No Drivers)"):
        return 9


    elif(sic=="Retail-Furniture Stores"):
        return 6

    elif(sic=="Agricultural Services"):
        return 0

    elif(sic=="Medicinal Chemicals and Botanical Products"):
        return 11

    elif(sic=="Biological Products, (No Diagnostic Substances)"):
        return 11

    elif(sic=="Household Audio and Video Equipment"):
        return 13

    elif(sic=="Air Transportation, Scheduled"):
        return 7

    elif(sic=="Sporting and Athletic Goods, Not Elsewhere Classified"):
        return 7
```

```python
        elif(sic=="Mobile Homes"):
            return 7
        elif(sic=="Natural Gas Distribution"):
            return 4
        elif(sic=="Apparel and Other Finished Products of Fabrics and Similar Material"):
            return 13
        elif(sic=="Services-Management Consulting Services"):
            return 7
        elif(sic=="Services-Computer Integrated Systems Design"):
            return 13
        elif(sic=="Services-Help Supply Services"):
            return 8
        elif(sic=="Metal Forgings And Stampings"):
             return 3
        elif(sic=="Laboratory Analytical Instruments"):
            return 13

        elif(sic=="Aircraft Parts and Auxiliary Equipment, Not Elsewhere Classified"):
            return 13

        elif(sic=="Household Furniture"):
            return 6
        elif(sic=="Retail-Auto and Home Supply Stores"):
            return 6
        elif(sic=="Insurance Agents, Brokers and Service"):
            return 7
        elif(sic=="Services-Amusement and Recreation Services"):
            return 8
        elif(sic=="Services-Health Services"):
            return 11
        elif(sic=="Electric Lighting And Wiring Equipment"):
            return 13
        elif(sic=="Plastics, Foil and Coated Paper Bags"):
            return 3

        elif(sic=="Services-Miscellaneous Health and Allied Services, Not Elsewhere Classif
            return 11

        else:
            return -1




#         if (number <= 999):
#         # Agriculture, Forestry and Fishing
#         return 0
#     elif (number <= 1499):
#         # Mining
#         return 1
#     elif (number <= 1799):
#         #Construction
#         return 2
```

```python
#       1000-1499
#       1500-1799
#       1800-1999 not used
#       2000-3999 Manufacturing
#       4000-4999 Transportation, Communications, Electric, Gas and Sanitary service
#       5000-5199 Wholesale Trade
#       5200-5999 Retail Trade
#       6000-6799 Finance, Insurance and Real Estate
#       7000-8999 Services
#       9100-9729 Public Administration
#       9900-9999 Nonclassifiable

count = 0
# Strips the newline character
sic_codes = {}
for line in Lines:
    number = line[:4]
    # go to the number that is not space
    count = 5
    for i in range(len(line)):
        if line[count] != ' ':
            break
        count+=1
    description = line[count:]
    print(number)
    print(description)
    sic_codes[description.strip()] = int(number)

    print("{}".format(line.strip()))

print(sic_codes)
```

```
0100
Agricultural Production-Crops

0100  Agricultural Production-Crops
0200
Agricultural Prod-Livestock & Animal Specialties

0200    Agricultural Prod-Livestock & Animal Specialties
0700
Agricultural Services

0700    Agricultural Services
0800
Forestry

0800    Forestry
0900
Fishing, Hunting and Trapping

0900    Fishing, Hunting and Trapping
1000
Metal Mining

1000    Metal Mining
1040
Gold and Silver Ores

1040    Gold and Silver Ores
1090
Miscellaneous Metal Ores
```

1090   Miscellaneous Metal Ores
1220
Bituminous Coal & Lignite Mining

1220   Bituminous Coal & Lignite Mining
1221
Bituminous Coal & Lignite Surface Mining

1221   Bituminous Coal & Lignite Surface Mining
1311
Crude Petroleum & Natural Gas

1311   Crude Petroleum & Natural Gas
1381
Drilling Oil & Gas Wells

1381   Drilling Oil & Gas Wells
1382
Oil & Gas Field Exploration Services

1382   Oil & Gas Field Exploration Services
1389
Oil & Gas Field Services, NEC

1389   Oil & Gas Field Services, NEC
1400
Mining & Quarrying of Nonmetallic Minerals (No Fuels)

1400   Mining & Quarrying of Nonmetallic Minerals (No Fuels)
1520
General Bldg Contractors - Residential Bldgs

1520   General Bldg Contractors - Residential Bldgs
1531
Operative Builders

1531   Operative Builders
1540
General Bldg Contractors - Nonresidential Bldgs

1540   General Bldg Contractors - Nonresidential Bldgs
1600
Heavy Construction Other Than Bldg Const - Contractors

1600   Heavy Construction Other Than Bldg Const - Contractors
1623
Water, Sewer, Pipeline, Comm & Power Line Construction

1623   Water, Sewer, Pipeline, Comm & Power Line Construction
1629
Heavy Construction, Not Elsewhere Classified[9]

1629   Heavy Construction, Not Elsewhere Classified[9]
1700
Construction - Special Trade Contractors

1700   Construction - Special Trade Contractors
1731
Electrical Work

1731   Electrical Work
2000
Food and Kindred Products

2000   Food and Kindred Products

```
2011
Meat Packing Plants


2011     Meat Packing Plants
2013
Sausages & Other Prepared Meat Products


2013     Sausages & Other Prepared Meat Products
2015
Poultry Slaughtering and Processing


2015     Poultry Slaughtering and Processing
2020
Dairy Products


2020     Dairy Products
2024
Ice Cream & Frozen Desserts


2024     Ice Cream & Frozen Desserts
2030
Canned, Frozen & Preserved Fruit, Veg & Food Specialties


2030     Canned, Frozen & Preserved Fruit, Veg & Food Specialties
2033
Canned, Fruits, Veg, Preserves, Jams & Jellies


2033     Canned, Fruits, Veg, Preserves, Jams & Jellies
2040
Grain Mill Products


2040     Grain Mill Products
2050
Bakery Products


2050     Bakery Products
2052
Cookies & Crackers


2052     Cookies & Crackers
2060
Sugar & Confectionery Products


2060     Sugar & Confectionery Products
2070
Fats & Oils


2070     Fats & Oils
2080
Beverages


2080     Beverages
2082
Malt Beverages


2082     Malt Beverages
2086
Bottled & Canned Soft Drinks & Carbonated Waters


2086     Bottled & Canned Soft Drinks & Carbonated Waters
2090
Miscellaneous Food Preparations & Kindred Products


2090     Miscellaneous Food Preparations & Kindred Products
2092
```

Prepared Fresh or Frozen Fish & Seafood

2092   Prepared Fresh or Frozen Fish & Seafood
2100
Tobacco Products

2100   Tobacco Products
2111
Cigarettes

2111   Cigarettes
2200
Textile Mill Products

2200   Textile Mill Products
2211
Broadwoven Fabric Mills, Cotton

2211   Broadwoven Fabric Mills, Cotton
2221
Broadwoven Fabric Mills, Man Made Fiber & Silk

2221   Broadwoven Fabric Mills, Man Made Fiber & Silk
2250
Knitting Mills

2250   Knitting Mills
2253
Knit Outerwear Mills

2253   Knit Outerwear Mills
2273
Carpets & Rugs

2273   Carpets & Rugs
2300
Apparel & Other Finished Prods of Fabrics & Similar Matl

2300   Apparel & Other Finished Prods of Fabrics & Similar Matl
2320
Men's & Boys' Furnishings, Work Clothing, & Allied Garments

2320   Men's & Boys' Furnishings, Work Clothing, & Allied Garments
2330
Women's, Misses', and Juniors Outerwear

2330   Women's, Misses', and Juniors Outerwear
2340
Women's, Misses', Children's & Infant's Undergarments

2340   Women's, Misses', Children's & Infant's Undergarments
2390
Miscellaneous Fabricated Textile Products

2390   Miscellaneous Fabricated Textile Products
2400
Lumber & Wood Products (No Furniture)

2400   Lumber & Wood Products (No Furniture)
2421
Sawmills & Planing Mills, General

2421   Sawmills & Planing Mills, General
2430
Millwood, Veneer, Plywood, & Structural Wood Members

2430   Millwood, Veneer, Plywood, & Structural Wood Members
2451
Mobile Homes

2451   Mobile Homes
2452
Prefabricated Wood Bldgs & Components

2452   Prefabricated Wood Bldgs & Components
2510
Household Furniture

2510   Household Furniture
2511
Wood Household Furniture, (No Upholstered)

2511   Wood Household Furniture, (No Upholstered)
2520
Office Furniture

2520   Office Furniture
2522
Office Furniture (No Wood)

2522   Office Furniture (No Wood)
2531
Public Bldg & Related Furniture

2531   Public Bldg & Related Furniture
2540
Partitions, Shelvg, Lockers, & office & Store Fixtures

2540   Partitions, Shelvg, Lockers, & office & Store Fixtures
2590
Miscellaneous Furniture & Fixtures

2590   Miscellaneous Furniture & Fixtures
2600
Papers & Allied Products

2600   Papers & Allied Products
2611
Pulp Mills

2611   Pulp Mills
2621
Paper Mills

2621   Paper Mills
2631
Paperboard Mills

2631   Paperboard Mills
2650
Paperboard Containers & Boxes

2650   Paperboard Containers & Boxes
2670
Converted Paper & Paperboard Prods (No Containers/Boxes)

2670   Converted Paper & Paperboard Prods (No Containers/Boxes)
2673
Plastics, Foil & Coated Paper Bags

2673   Plastics, Foil & Coated Paper Bags
2711
Newspapers: Publishing or Publishing & Printing

2711   Newspapers: Publishing or Publishing & Printing
2721
Periodicals: Publishing or Publishing & Printing

2721   Periodicals: Publishing or Publishing & Printing
2731
Books: Publishing or Publishing & Printing

2731   Books: Publishing or Publishing & Printing
2732
Book Printing

2732   Book Printing
2741
Miscellaneous Publishing

2741   Miscellaneous Publishing
2750
Commercial Printing

2750   Commercial Printing
2761
Manifold Business Forms

2761   Manifold Business Forms
2771
Greeting Cards

2771   Greeting Cards
2780
Blankbooks, Looseleaf Binders & Bookbinding & Related Work

2780   Blankbooks, Looseleaf Binders & Bookbinding & Related Work
2790
Service Industries For The Printing Trade

2790   Service Industries For The Printing Trade
2800
Chemicals & Allied Products

2800   Chemicals & Allied Products
2810
Industrial Inorganic Chemicals

2810   Industrial Inorganic Chemicals
2820
Plastic Material, Synth Resin/Rubber, Cellulos (No Glass)

2820   Plastic Material, Synth Resin/Rubber, Cellulos (No Glass)
2821
Plastic Materials, Synth Resins & Nonvulcan Elastomers

2821   Plastic Materials, Synth Resins & Nonvulcan Elastomers
2833
Medicinal Chemicals & Botanical Products

2833   Medicinal Chemicals & Botanical Products
2834
Pharmaceutical Preparations

2834   Pharmaceutical Preparations

2835
In Vitro & In Vivo Diagnostic Substances

2835   In Vitro & In Vivo Diagnostic Substances
2836
Biological Products, (No Diagnostic Substances)

2836   Biological Products, (No Diagnostic Substances)
2840
Soap, Detergents, Cleaning Preparations, Perfumes, Cosmetics

2840   Soap, Detergents, Cleaning Preparations, Perfumes, Cosmetics
2842
Specialty Cleaning, Polishing and Sanitation Preparations

2842   Specialty Cleaning, Polishing and Sanitation Preparations
2844
Perfumes, Cosmetics & Other Toilet Preparations

2844   Perfumes, Cosmetics & Other Toilet Preparations
2851
Paints, Varnishes, Lacquers, Enamels & Allied Prods

2851   Paints, Varnishes, Lacquers, Enamels & Allied Prods
2860
Industrial Organic Chemicals

2860   Industrial Organic Chemicals
2870
Agricultural Chemicals

2870   Agricultural Chemicals
2890
Miscellaneous Chemical Products

2890   Miscellaneous Chemical Products
2891
Adhesives & Sealants

2891   Adhesives & Sealants
2911
Petroleum Refining

2911   Petroleum Refining
2950
Asphalt Paving & Roofing Materials

2950   Asphalt Paving & Roofing Materials
2990
Miscellaneous Products of Petroleum & Coal

2990   Miscellaneous Products of Petroleum & Coal
3011
Tires & Inner Tubes

3011   Tires & Inner Tubes
3021
Rubber & Plastics Footwear

3021   Rubber & Plastics Footwear
3050
Gaskets, Packg & Sealg Devices & Rubber & Plastics Hose

3050   Gaskets, Packg & Sealg Devices & Rubber & Plastics Hose
3060

Fabricated Rubber Products, NEC

3060   Fabricated Rubber Products, NEC
3080
Miscellaneous Plastics Products

3080   Miscellaneous Plastics Products
3081
Unsupported Plastics Film & Sheet

3081   Unsupported Plastics Film & Sheet
3086
Plastics Foam Products

3086   Plastics Foam Products
3089
Plastics Products, NEC

3089   Plastics Products, NEC
3100
Leather & Leather Products

3100   Leather & Leather Products
3140
Footwear, (No Rubber)

3140   Footwear, (No Rubber)
3211
Flat Glass

3211   Flat Glass
3220
Glass & Glassware, Pressed or Blown

3220   Glass & Glassware, Pressed or Blown
3221
Glass Containers

3221   Glass Containers
3231
Glass Products, Made of Purchased Glass

3231   Glass Products, Made of Purchased Glass
3241
Cement, Hydraulic

3241   Cement, Hydraulic
3250
Structural Clay Products

3250   Structural Clay Products
3260
Pottery & Related Products

3260   Pottery & Related Products
3270
Concrete, Gypsum & Plaster Products

3270   Concrete, Gypsum & Plaster Products
3272
Concrete Products, Except Block & Brick

3272   Concrete Products, Except Block & Brick
3281
Cut Stone & Stone Products

3281   Cut Stone & Stone Products
3290
Abrasive, Asbestos & Misc Nonmetallic Mineral Prods

3290   Abrasive, Asbestos & Misc Nonmetallic Mineral Prods
3310
Steel Works, Blast Furnaces & Rolling & Finishing Mills

3310   Steel Works, Blast Furnaces & Rolling & Finishing Mills
3312
Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens)

3312   Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens)
3317
Steel Pipe & Tubes

3317   Steel Pipe & Tubes
3320
Iron & Steel Foundries

3320   Iron & Steel Foundries
3330
Primary Smelting & Refining of Nonferrous Metals

3330   Primary Smelting & Refining of Nonferrous Metals
3334
Primary Production of Aluminum

3334   Primary Production of Aluminum
3341
Secondary Smelting & Refining of Nonferrous Metals

3341   Secondary Smelting & Refining of Nonferrous Metals
3350
Rolling Drawing & Extruding of Nonferrous Metals

3350   Rolling Drawing & Extruding of Nonferrous Metals
3357
Drawing & Insulating of Nonferrous Wire

3357   Drawing & Insulating of Nonferrous Wire
3360
Nonferrous Foundries (Castings)

3360   Nonferrous Foundries (Castings)
3390
Miscellaneous Primary Metal Products

3390   Miscellaneous Primary Metal Products
3411
Metal Cans

3411   Metal Cans
3412
Metal Shipping Barrels, Drums, Kegs & Pails

3412   Metal Shipping Barrels, Drums, Kegs & Pails
3420
Cutlery, Handtools & General Hardware

3420   Cutlery, Handtools & General Hardware
3430
Heating Equip, Except Elec & Warm Air; & Plumbing Fixtures

3430   Heating Equip, Except Elec & Warm Air; & Plumbing Fixtures
3433
Heating Equipment, Except Electric & Warm Air Furnaces

3433   Heating Equipment, Except Electric & Warm Air Furnaces
3440
Fabricated Structural Metal Products

3440   Fabricated Structural Metal Products
3442
Metal Doors, Sash, Frames, Moldings & Trim

3442   Metal Doors, Sash, Frames, Moldings & Trim
3443
Fabricated Plate Work (Boiler Shops)

3443   Fabricated Plate Work (Boiler Shops)
3444
Sheet Metal Work

3444   Sheet Metal Work
3448
Prefabricated Metal Buildings & Components

3448   Prefabricated Metal Buildings & Components
3451
Screw Machine Products

3451   Screw Machine Products
3452
Bolts, Nuts, Screws, Rivets & Washers

3452   Bolts, Nuts, Screws, Rivets & Washers
3460
Metal Forgings & Stampings

3460   Metal Forgings & Stampings
3470
Coating, Engraving & Allied Services

3470   Coating, Engraving & Allied Services
3480
Ordnance & Accessories, (No Vehicles/Guided Missiles)

3480   Ordnance & Accessories, (No Vehicles/Guided Missiles)
3490
Miscellaneous Fabricated Metal Products

3490   Miscellaneous Fabricated Metal Products
3510
Engines & Turbines

3510   Engines & Turbines
3523
Farm Machinery & Equipment

3523   Farm Machinery & Equipment
3524
Lawn & Garden Tractors & Home Lawn & Gardens Equip

3524   Lawn & Garden Tractors & Home Lawn & Gardens Equip
3530
Construction, Mining & Materials Handling Machinery & Equip

3530   Construction, Mining & Materials Handling Machinery & Equip

3531
Construction Machinery & Equip

3531   Construction Machinery & Equip
3532
Mining Machinery & Equip (No Oil & Gas Field Mach & Equip)

3532   Mining Machinery & Equip (No Oil & Gas Field Mach & Equip)
3533
Oil & Gas Field Machinery & Equipment

3533   Oil & Gas Field Machinery & Equipment
3537
Industrial Trucks, Tractors, Trailers & Stackers

3537   Industrial Trucks, Tractors, Trailers & Stackers
3540
Metalworkg Machinery & Equipment

3540   Metalworkg Machinery & Equipment
3541
Machine Tools, Metal Cutting Types

3541   Machine Tools, Metal Cutting Types
3550
Special Industry Machinery (No Metalworking Machinery)

3550   Special Industry Machinery (No Metalworking Machinery)
3555
Printing Trades Machinery & Equipment

3555   Printing Trades Machinery & Equipment
3559
Special Industry Machinery, NEC

3559   Special Industry Machinery, NEC
3560
General Industrial Machinery & Equipment

3560   General Industrial Machinery & Equipment
3561
Pumps & Pumping Equipment

3561   Pumps & Pumping Equipment
3562
Ball & Roller Bearings

3562   Ball & Roller Bearings
3564
Industrial & Commercial Fans & Blowers & Air Purifying Equip

3564   Industrial & Commercial Fans & Blowers & Air Purifying Equip
3567
Industrial Process Furnaces & Ovens

3567   Industrial Process Furnaces & Ovens
3569
General Industrial Machinery & Equipment, NEC

3569   General Industrial Machinery & Equipment, NEC
3570
Computer & office Equipment

3570   Computer & office Equipment
3571

Electronic Computers

3571   Electronic Computers
3572
Computer Storage Devices

3572   Computer Storage Devices
3575
Computer Terminals

3575   Computer Terminals
3576
Computer Communications Equipment

3576   Computer Communications Equipment
3577
Computer Peripheral Equipment, NEC

3577   Computer Peripheral Equipment, NEC
3578
Calculating & Accounting Machines (No Electronic Computers)

3578   Calculating & Accounting Machines (No Electronic Computers)
3579
Office Machines, NEC

3579   Office Machines, NEC
3580
Refrigeration & Service Industry Machinery

3580   Refrigeration & Service Industry Machinery
3585
Air-Cond & Warm Air Heatg Equip & Comm & Indl Refrig Equip

3585   Air-Cond & Warm Air Heatg Equip & Comm & Indl Refrig Equip
3590
Misc Industrial & Commercial Machinery & Equipment

3590   Misc Industrial & Commercial Machinery & Equipment
3600
Electronic & Other Electrical Equipment (No Computer Equip)

3600   Electronic & Other Electrical Equipment (No Computer Equip)
3612
Power, Distribution & Specialty Transformers

3612   Power, Distribution & Specialty Transformers
3613
Switchgear & Switchboard Apparatus

3613   Switchgear & Switchboard Apparatus
3620
Electrical Industrial Apparatus

3620   Electrical Industrial Apparatus
3621
Motors & Generators

3621   Motors & Generators
3630
Household Appliances

3630   Household Appliances
3634
Electric Housewares & Fans

3634   Electric Housewares & Fans
3640
Electric Lighting & Wiring Equipment

3640   Electric Lighting & Wiring Equipment
3651
Household Audio & Video Equipment

3651   Household Audio & Video Equipment
3652
Phonograph Records & Prerecorded Audio Tapes & Disks

3652   Phonograph Records & Prerecorded Audio Tapes & Disks
3661
Telephone & Telegraph Apparatus

3661   Telephone & Telegraph Apparatus
3663
Radio & TV Broadcasting & Communications Equipment

3663   Radio & TV Broadcasting & Communications Equipment
3669
Communications Equipment, NEC

3669   Communications Equipment, NEC
3670
Electronic Components & Accessories

3670   Electronic Components & Accessories
3672
Printed Circuit Boards

3672   Printed Circuit Boards
3674
Semiconductors & Related Devices

3674   Semiconductors & Related Devices
3677
Electronic Coils, Transformers & Other Inductors

3677   Electronic Coils, Transformers & Other Inductors
3678
Electronic Connectors

3678   Electronic Connectors
3679
Electronic Components, NEC

3679   Electronic Components, NEC
3690
Miscellaneous Electrical Machinery, Equipment & Supplies

3690   Miscellaneous Electrical Machinery, Equipment & Supplies
3695
Magnetic & Optical Recording Media

3695   Magnetic & Optical Recording Media
3711
Motor Vehicles & Passenger Car Bodies

3711   Motor Vehicles & Passenger Car Bodies
3713
Truck & Bus Bodies

3713   Truck & Bus Bodies
3714
Motor Vehicle Parts & Accessories

3714   Motor Vehicle Parts & Accessories
3715
Truck Trailers

3715   Truck Trailers
3716
Motor Homes

3716   Motor Homes
3720
Aircraft & Parts

3720   Aircraft & Parts
3721
Aircraft

3721   Aircraft
3724
Aircraft Engines & Engine Parts

3724   Aircraft Engines & Engine Parts
3728
Aircraft Parts & Auxiliary Equipment, NEC

3728   Aircraft Parts & Auxiliary Equipment, NEC
3730
Ship & Boat Building & Repairing

3730   Ship & Boat Building & Repairing
3743
Railroad Equipment

3743   Railroad Equipment
3751
Motorcycles, Bicycles & Parts

3751   Motorcycles, Bicycles & Parts
3760
Guided Missiles & Space Vehicles & Parts

3760   Guided Missiles & Space Vehicles & Parts
3790
Miscellaneous Transportation Equipment

3790   Miscellaneous Transportation Equipment
3812
Search, Detection, Navigation, Guidance, Aeronautical Sys

3812   Search, Detection, Navigation, Guidance, Aeronautical Sys
3821
Laboratory Apparatus & Furniture

3821   Laboratory Apparatus & Furniture
3822
Auto Controls For Regulating Residential & Comml Environments

3822   Auto Controls For Regulating Residential & Comml Environments
3823
Industrial Instruments For Measurement, Display, and Control

3823   Industrial Instruments For Measurement, Display, and Control

3824
Totalizing Fluid Meters & Counting Devices

3824   Totalizing Fluid Meters & Counting Devices
3825
Instruments For Meas & Testing of Electricity & Elec Signals

3825   Instruments For Meas & Testing of Electricity & Elec Signals
3826
Laboratory Analytical Instruments

3826   Laboratory Analytical Instruments
3827
Optical Instruments & Lenses

3827   Optical Instruments & Lenses
3829
Measuring & Controlling Devices, NEC

3829   Measuring & Controlling Devices, NEC
3841
Surgical & Medical Instruments & Apparatus

3841   Surgical & Medical Instruments & Apparatus
3842
Orthopedic, Prosthetic & Surgical Appliances & Supplies

3842   Orthopedic, Prosthetic & Surgical Appliances & Supplies
3843
Dental Equipment & Supplies

3843   Dental Equipment & Supplies
3844
X-Ray Apparatus & Tubes & Related Irradiation Apparatus

3844   X-Ray Apparatus & Tubes & Related Irradiation Apparatus
3845
Electromedical & Electrotherapeutic Apparatus

3845   Electromedical & Electrotherapeutic Apparatus
3851
Ophthalmic Goods

3851   Ophthalmic Goods
3861
Photographic Equipment & Supplies

3861   Photographic Equipment & Supplies
3873
Watches, Clocks, Clockwork Operated Devices/Parts

3873   Watches, Clocks, Clockwork Operated Devices/Parts
3910
Jewelry, Silverware & Plated Ware

3910   Jewelry, Silverware & Plated Ware
3911
Jewelry, Precious Metal

3911   Jewelry, Precious Metal
3931
Musical Instruments

3931   Musical Instruments
3942

Dolls & Stuffed Toys

3942   Dolls & Stuffed Toys
3944
Games, Toys & Children's Vehicles (No Dolls & Bicycles)

3944   Games, Toys & Children's Vehicles (No Dolls & Bicycles)
3949
Sporting & Athletic Goods, NEC

3949   Sporting & Athletic Goods, NEC
3950
Pens, Pencils & Other Artists' Materials

3950   Pens, Pencils & Other Artists' Materials
3960
Costume Jewelry & Novelties

3960   Costume Jewelry & Novelties
3990
Miscellaneous Manufacturing Industries

3990   Miscellaneous Manufacturing Industries
4011
Railroads, Line-Haul Operating

4011   Railroads, Line-Haul Operating
4013
Railroad Switching & Terminal Establishments

4013   Railroad Switching & Terminal Establishments
4100
Local & Suburban Transit & Interurban Hwy Passenger Trans

4100   Local & Suburban Transit & Interurban Hwy Passenger Trans
4210
Trucking & Courier Services (No Air)

4210   Trucking & Courier Services (No Air)
4213
Trucking (No Local)

4213   Trucking (No Local)
4220
Public Warehousing & Storage

4220   Public Warehousing & Storage
4231
Terminal Maintenance Facilities For Motor Freight Transport

4231   Terminal Maintenance Facilities For Motor Freight Transport
4400
Water Transportation

4400   Water Transportation
4412
Deep Sea Foreign Transportation of Freight

4412   Deep Sea Foreign Transportation of Freight
4512
Air Transportation, Scheduled

4512   Air Transportation, Scheduled
4513
Air Courier Services

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4513     Air Courier Services
4522
Air Transportation, Nonscheduled


4522     Air Transportation, Nonscheduled
4581
Airports, Flying Fields & Airport Terminal Services


4581     Airports, Flying Fields & Airport Terminal Services
4610
Pipe Lines (No Natural Gas)


4610     Pipe Lines (No Natural Gas)
4700
Transportation Services


4700     Transportation Services
4731
Arrangement of Transportation of Freight & Cargo


4731     Arrangement of Transportation of Freight & Cargo
4812
Radiotelephone Communications


4812     Radiotelephone Communications
4813
Telephone Communications (No Radiotelephone)


4813     Telephone Communications (No Radiotelephone)
4822
Telegraph & Other Message Communications


4822     Telegraph & Other Message Communications
4832
Radio Broadcasting Stations


4832     Radio Broadcasting Stations
4833
Television Broadcasting Stations


4833     Television Broadcasting Stations
4841
Cable & Other Pay Television Services


4841     Cable & Other Pay Television Services
4899
Communications Services, NEC


4899     Communications Services, NEC
4900
Electric, Gas & Sanitary Services


4900     Electric, Gas & Sanitary Services
4911
Electric Services


4911     Electric Services
4922
Natural Gas Transmission


4922     Natural Gas Transmission
4923
Natural Gas Transmission & Distribution
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4923     Natural Gas Transmission & Distribution
4924
Natural Gas Distribution

4924     Natural Gas Distribution
4931
Electric & Other Services Combined

4931     Electric & Other Services Combined
4932
Gas & Other Services Combined

4932     Gas & Other Services Combined
4941
Water Supply

4941     Water Supply
4950
Sanitary Services

4950     Sanitary Services
4953
Refuse Systems

4953     Refuse Systems
4955
Hazardous Waste Management

4955     Hazardous Waste Management
4961
Steam & Air-Conditioning Supply

4961     Steam & Air-Conditioning Supply
4991
Co-generation Services & Small Power Producers

4991     Co-generation Services & Small Power Producers
5000
Wholesale-Durable Goods

5000     Wholesale-Durable Goods
5010
Wholesale-Motor Vehicles & Motor Vehicle Parts & Supplies

5010     Wholesale-Motor Vehicles & Motor Vehicle Parts & Supplies
5013
Wholesale-Motor Vehicle Supplies & New Parts

5013     Wholesale-Motor Vehicle Supplies & New Parts
5020
Wholesale-Furniture & Home Furnishings

5020     Wholesale-Furniture & Home Furnishings
5030
Wholesale-Lumber & Other Construction Materials

5030     Wholesale-Lumber & Other Construction Materials
5031
Wholesale-Lumber, Plywood, millwork & Wood Panels

5031     Wholesale-Lumber, Plywood, millwork & Wood Panels
5040
Wholesale-Professional & Commercial Equipment & Supplies

5040     Wholesale-Professional & Commercial Equipment & Supplies
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5045
Wholesale-Computers & Peripheral Equipment & Software

5045   Wholesale-Computers & Peripheral Equipment & Software
5047
Wholesale-Medical, Dental & Hospital Equipment & Supplies

5047   Wholesale-Medical, Dental & Hospital Equipment & Supplies
5050
Wholesale-Metals & Minerals (No Petroleum)

5050   Wholesale-Metals & Minerals (No Petroleum)
5051
Wholesale-Metals Service Centers & Offices

5051   Wholesale-Metals Service Centers & Offices
5063
Wholesale-Electrical Apparatus & Equipment, Wiring Supplies

5063   Wholesale-Electrical Apparatus & Equipment, Wiring Supplies
5064
Wholesale-Electrical Appliances, TV & Radio Sets

5064   Wholesale-Electrical Appliances, TV & Radio Sets
5065
Wholesale-Electronic Parts & Equipment, NEC

5065   Wholesale-Electronic Parts & Equipment, NEC
5070
Wholesale-Hardware & Plumbing & Heating Equipment & Supplies

5070   Wholesale-Hardware & Plumbing & Heating Equipment & Supplies
5072
Wholesale-Hardware

5072   Wholesale-Hardware
5080
Wholesale-Machinery, Equipment & Supplies

5080   Wholesale-Machinery, Equipment & Supplies
5082
Wholesale-Construction & Mining (No Petro) Machinery & Equip

5082   Wholesale-Construction & Mining (No Petro) Machinery & Equip
5084
Wholesale-Industrial Machinery & Equipment

5084   Wholesale-Industrial Machinery & Equipment
5090
Wholesale-Misc Durable Goods

5090   Wholesale-Misc Durable Goods
5094
Wholesale-Jewelry, Watches, Precious Stones & Metals

5094   Wholesale-Jewelry, Watches, Precious Stones & Metals
5099
Wholesale-Durable Goods, NEC

5099   Wholesale-Durable Goods, NEC
5110
Wholesale-Paper & Paper Products

5110   Wholesale-Paper & Paper Products
5122

Wholesale-Drugs, Proprietaries & Druggists' Sundries

5122   Wholesale-Drugs, Proprietaries & Druggists' Sundries
5130
Wholesale-Apparel, Piece Goods & Notions

5130   Wholesale-Apparel, Piece Goods & Notions
5140
Wholesale-Groceries & Related Products

5140   Wholesale-Groceries & Related Products
5141
Wholesale-Groceries, General Line (merchandise)

5141   Wholesale-Groceries, General Line (merchandise)
5150
Wholesale-Farm Product Raw Materials

5150   Wholesale-Farm Product Raw Materials
5160
Wholesale-Chemicals & Allied Products

5160   Wholesale-Chemicals & Allied Products
5171
Wholesale-Petroleum Bulk Stations & Terminals

5171   Wholesale-Petroleum Bulk Stations & Terminals
5172
Wholesale-Petroleum & Petroleum Products (No Bulk Stations)

5172   Wholesale-Petroleum & Petroleum Products (No Bulk Stations)
5180
Wholesale-Beer, Wine & Distilled Alcoholic Beverages

5180   Wholesale-Beer, Wine & Distilled Alcoholic Beverages
5190
Wholesale-Miscellaneous Non-durable Goods

5190   Wholesale-Miscellaneous Non-durable Goods
5200
Retail-Building Materials, Hardware, Garden Supply

5200   Retail-Building Materials, Hardware, Garden Supply
5211
Retail-Lumber & Other Building Materials Dealers

5211   Retail-Lumber & Other Building Materials Dealers
5271
Retail-Mobile Home Dealers

5271   Retail-Mobile Home Dealers
5311
Retail-Department Stores

5311   Retail-Department Stores
5331
Retail-Variety Stores

5331   Retail-Variety Stores
5399
Retail-Misc General Merchandise Stores

5399   Retail-Misc General Merchandise Stores
5400
Retail-Food Stores

5400   Retail-Food Stores
5411
Retail-Grocery Stores

5411   Retail-Grocery Stores
5412
Retail-Convenience Stores

5412   Retail-Convenience Stores
5500
Retail-Auto Dealers & Gasoline Stations

5500   Retail-Auto Dealers & Gasoline Stations
5531
Retail-Auto & Home Supply Stores

5531   Retail-Auto & Home Supply Stores
5551
Boat Dealers

5551   Boat Dealers
5600
Retail-Apparel & Accessory Stores

5600   Retail-Apparel & Accessory Stores
5621
Retail-Women's Clothing Stores

5621   Retail-Women's Clothing Stores
5651
Retail-Family Clothing Stores

5651   Retail-Family Clothing Stores
5661
Retail-Shoe Stores

5661   Retail-Shoe Stores
5700
Retail-Home Furniture, Furnishings & Equipment Stores

5700   Retail-Home Furniture, Furnishings & Equipment Stores
5712
Retail-Furniture Stores

5712   Retail-Furniture Stores
5731
Retail-Radio, TV & Consumer Electronics Stores

5731   Retail-Radio, TV & Consumer Electronics Stores
5734
Retail-Computer & Computer Software Stores

5734   Retail-Computer & Computer Software Stores
5735
Retail-Record & Prerecorded Tape Stores

5735   Retail-Record & Prerecorded Tape Stores
5810
Retail-Eating & Drinking Places

5810   Retail-Eating & Drinking Places
5812
Retail-Eating Places

5812   Retail-Eating Places
5900
Retail-Miscellaneous Retail

5900   Retail-Miscellaneous Retail
5912
Retail-Drug Stores and Proprietary Stores

5912   Retail-Drug Stores and Proprietary Stores
5940
Retail-Miscellaneous Shopping Goods Stores

5940   Retail-Miscellaneous Shopping Goods Stores
5944
Retail-Jewelry Stores

5944   Retail-Jewelry Stores
5945
Retail-Hobby, Toy & Game Shops

5945   Retail-Hobby, Toy & Game Shops
5960
Retail-Nonstore Retailers

5960   Retail-Nonstore Retailers
5961
Retail-Catalog & Mail-Order Houses

5961   Retail-Catalog & Mail-Order Houses
5990
Retail-Retail Stores, NEC

5990   Retail-Retail Stores, NEC
6012
Pay Day Lenders

6012   Pay Day Lenders
6021
National Commercial Banks

6021   National Commercial Banks
6022
State Commercial Banks

6022   State Commercial Banks
6029
Commercial Banks, NEC

6029   Commercial Banks, NEC
6035
Savings Institution, Federally Chartered

6035   Savings Institution, Federally Chartered
6036
Savings Institutions, Not Federally Chartered

6036   Savings Institutions, Not Federally Chartered
6099
Functions Related To Depository Banking, NEC

6099   Functions Related To Depository Banking, NEC
6111
Federal & Federally Sponsored Credit Agencies

6111   Federal & Federally Sponsored Credit Agencies

6141
Personal Credit Institutions

6141   Personal Credit Institutions
6153
Short-Term Business Credit Institutions

6153   Short-Term Business Credit Institutions
6159
Miscellaneous Business Credit Institution

6159   Miscellaneous Business Credit Institution
6162
Mortgage Bankers & Loan Correspondents

6162   Mortgage Bankers & Loan Correspondents
6163
Loan Brokers

6163   Loan Brokers
6172
Finance Lessors

6172   Finance Lessors
6189
Asset-Backed Securities

6189   Asset-Backed Securities
6199
Finance Services

6199   Finance Services
6200
Security & Commodity Brokers, Dealers, Exchanges & Services

6200   Security & Commodity Brokers, Dealers, Exchanges & Services
6211
Security Brokers, Dealers & Flotation Companies

6211   Security Brokers, Dealers & Flotation Companies
6221
Commodity Contracts Brokers & Dealers

6221   Commodity Contracts Brokers & Dealers
6282
Investment Advice

6282   Investment Advice
6311
Life Insurance

6311   Life Insurance
6321
Accident & Health Insurance

6321   Accident & Health Insurance
6324
Hospital & Medical Service Plans

6324   Hospital & Medical Service Plans
6331
Fire, Marine & Casualty Insurance

6331   Fire, Marine & Casualty Insurance
6351

Surety Insurance

6351   Surety Insurance
6361
Title Insurance

6361   Title Insurance
6399
Insurance Carriers, NEC

6399   Insurance Carriers, NEC
6411
Insurance Agents, Brokers & Service

6411   Insurance Agents, Brokers & Service
6500
Real Estate

6500   Real Estate
6510
Real Estate Operators (No Developers) & Lessors

6510   Real Estate Operators (No Developers) & Lessors
6512
Operators of Nonresidential Buildings

6512   Operators of Nonresidential Buildings
6513
Operators of Apartment Buildings

6513   Operators of Apartment Buildings
6519
Lessors of Real Property, NEC

6519   Lessors of Real Property, NEC
6531
Real Estate Agents & Managers (For Others)

6531   Real Estate Agents & Managers (For Others)
6532
Real Estate Dealers (For Their Own Account)

6532   Real Estate Dealers (For Their Own Account)
6552
Land Subdividers & Developers (No Cemeteries)

6552   Land Subdividers & Developers (No Cemeteries)
6770
Blank Checks

6770   Blank Checks
6792
Oil Royalty Traders

6792   Oil Royalty Traders
6794
Patent Owners & Lessors

6794   Patent Owners & Lessors
6795
Mineral Royalty Traders

6795   Mineral Royalty Traders
6798
Real Estate Investment Trusts

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6798    Real Estate Investment Trusts
6799
Investors, NEC

6799    Investors, NEC
7000
Hotels, Rooming Houses, Camps & Other Lodging Places

7000    Hotels, Rooming Houses, Camps & Other Lodging Places
7011
Hotels & Motels

7011    Hotels & Motels
7200
Services-Personal Services

7200    Services-Personal Services
7310
Services-Advertising

7310    Services-Advertising
7311
Services-Advertising Agencies

7311    Services-Advertising Agencies
7320
Services-Consumer Credit Reporting, Collection Agencies

7320    Services-Consumer Credit Reporting, Collection Agencies
7330
Services-Mailing, Reproduction, Commercial Art & Photography

7330    Services-Mailing, Reproduction, Commercial Art & Photography
7331
Services-Direct Mail Advertising Services

7331    Services-Direct Mail Advertising Services
7334
Services-Photocopying and Duplicating Services

7334    Services-Photocopying and Duplicating Services
7340
Services-To Dwellings & Other Buildings

7340    Services-To Dwellings & Other Buildings
7350
Services-Miscellaneous Equipment Rental & Leasing

7350    Services-Miscellaneous Equipment Rental & Leasing
7359
Services-Equipment Rental & Leasing, NEC

7359    Services-Equipment Rental & Leasing, NEC
7361
Services-Employment Agencies

7361    Services-Employment Agencies
7363
Services-Help Supply Services

7363    Services-Help Supply Services
7370
Services-Computer Programming, Data Processing, Etc.
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7370   Services-Computer Programming, Data Processing, Etc.
7371
Services-Computer Programming Services

7371   Services-Computer Programming Services
7372
Services-Prepackaged Software

7372   Services-Prepackaged Software
7373
Services-Computer Integrated Systems Design

7373   Services-Computer Integrated Systems Design
7374
Services-Computer Processing & Data Preparation

7374   Services-Computer Processing & Data Preparation
7377
Services-Computer Rental & Leasing

7377   Services-Computer Rental & Leasing
7380
Services-Miscellaneous Business Services

7380   Services-Miscellaneous Business Services
7381
Services-Detective, Guard & Armored Car Services

7381   Services-Detective, Guard & Armored Car Services
7384
Services-Photofinishing Laboratories

7384   Services-Photofinishing Laboratories
7385
Services-Telephone Interconnect Systems

7385   Services-Telephone Interconnect Systems
7389
Services-Business Services, NEC

7389   Services-Business Services, NEC
7500
Services-Automotive Repair, Services & Parking

7500   Services-Automotive Repair, Services & Parking
7510
Services-Auto Rental & Leasing (No Drivers)

7510   Services-Auto Rental & Leasing (No Drivers)
7600
Services-Miscellaneous Repair Services

7600   Services-Miscellaneous Repair Services
7812
Services-Motion Picture & Video Tape Production

7812   Services-Motion Picture & Video Tape Production
7819
Services-Allied To Motion Picture Production

7819   Services-Allied To Motion Picture Production
7822
Services-Motion Picture & Video Tape Distribution

7822   Services-Motion Picture & Video Tape Distribution

```
7829
Services-Allied To Motion Picture Distribution


7829    Services-Allied To Motion Picture Distribution
7830
Services-Motion Picture Theaters


7830    Services-Motion Picture Theaters
7841
Services-Video Tape Rental


7841    Services-Video Tape Rental
7900
Services-Amusement & Recreation Services


7900    Services-Amusement & Recreation Services
7948
Services-Racing, Including Track Operation


7948    Services-Racing, Including Track Operation
7990
Services-Miscellaneous Amusement & Recreation


7990    Services-Miscellaneous Amusement & Recreation
7994
Services-Video Game Arcades


7994    Services-Video Game Arcades
7995
Services-Gambling Transactions


7995    Services-Gambling Transactions
7996
Services-Amusement Parks


7996    Services-Amusement Parks
7997
Services-Membership Sports & Recreation Clubs


7997    Services-Membership Sports & Recreation Clubs
8000
Services-Health Services


8000    Services-Health Services
8011
Services-Offices & Clinics of Doctors of Medicine


8011    Services-Offices & Clinics of Doctors of Medicine
8050
Services-Nursing & Personal Care Facilities


8050    Services-Nursing & Personal Care Facilities
8051
Services-Skilled Nursing Care Facilities


8051    Services-Skilled Nursing Care Facilities
8060
Services-Hospitals


8060    Services-Hospitals
8062
Services-General Medical & Surgical Hospitals, NEC


8062    Services-General Medical & Surgical Hospitals, NEC
8071
```

Services-Medical Laboratories

8071   Services-Medical Laboratories
8082
Services-Home Health Care Services

8082   Services-Home Health Care Services
8090
Services-Misc Health & Allied Services, NEC

8090   Services-Misc Health & Allied Services, NEC
8093
Services-Specialty Outpatient Facilities, NEC

8093   Services-Specialty Outpatient Facilities, NEC
8111
Services-Legal Services

8111   Services-Legal Services
8200
Services-Educational Services

8200   Services-Educational Services
8300
Services-Social Services

8300   Services-Social Services
8351
Services-Child Day Care Services

8351   Services-Child Day Care Services
8600
Services-Membership organizations

8600   Services-Membership organizations
8700
Services-Engineering, Accounting, Research, Management

8700   Services-Engineering, Accounting, Research, Management
8711
Services-Engineering Services

8711   Services-Engineering Services
8731
Services-Commercial Physical & Biological Research

8731   Services-Commercial Physical & Biological Research
8734
Services-Testing Laboratories

8734   Services-Testing Laboratories
8741
Services-Management Services

8741   Services-Management Services
8742
Services-Management Consulting Services

8742   Services-Management Consulting Services
8744
Services-Facilities Support Management Services

8744   Services-Facilities Support Management Services
8748
Business Consulting Services, Not Elsewhere Classified

8748   Business Consulting Services, Not Elsewhere Classified
8880
American Depositary Receipts

8880   American Depositary Receipts
8888
Foreign Governments

8888   Foreign Governments
8900
Services-Services, NEC

8900   Services-Services, NEC
9721
International Affairs

9721   International Affairs
9995
Non-Operating Establishments
9995   Non-Operating Establishments

{'Agricultural Production-Crops': 100, 'Agricultural Prod-Livestock & Animal Specialties': 200, 'Agricultural Services': 700, 'Forestry': 800, 'Fishing, Hunting and Trapping': 900, 'Metal Mining': 1000, 'Gold and Silver Ores': 1040, 'Miscellaneous Metal Ores': 1090, 'Bituminous Coal & Lignite Mining': 1220, 'Bituminous Coal & Lignite Surface Mining': 1221, 'Crude Petroleum & Natural Gas': 1311, 'Drilling Oil & Gas Wells': 1381, 'Oil & Gas Field Exploration Services': 1382, 'Oil & Gas Field Services, NEC': 1389, 'Mining & Quarrying of Nonmetallic Minerals (No Fuels)': 1400, 'General Bldg Contractors - Residential Bldgs': 1520, 'Operative Builders': 1531, 'General Bldg Contractors - Nonresidential Bldgs': 1540, 'Heavy Construction Other Than Bldg Const - Contractors': 1600, 'Water, Sewer, Pipeline, Comm & Power Line Construction': 1623, 'Heavy Construction, Not Elsewhere Classified[9]': 1629, 'Construction - Special Trade Contractors': 1700, 'Electrical Work': 1731, 'Food and Kindred Products': 2000, 'Meat Packing Plants': 2011, 'Sausages & Other Prepared Meat Products': 2013, 'Poultry Slaughtering and Processing': 2015, 'Dairy Products': 2020, 'Ice Cream & Frozen Desserts': 2024, 'Canned, Frozen & Preserved Fruit, Veg & Food Specialties': 2030, 'Canned, Fruits, Veg, Preserves, Jams & Jellies': 2033, 'Grain Mill Products': 2040, 'Bakery Products': 2050, 'Cookies & Crackers': 2052, 'Sugar & Confectionery Products': 2060, 'Fats & Oils': 2070, 'Beverages': 2080, 'Malt Beverages': 2082, 'Bottled & Canned Soft Drinks & Carbonated Waters': 2086, 'Miscellaneous Food Preparations & Kindred Products': 2090, 'Prepared Fresh or Frozen Fish & Seafood': 2092, 'Tobacco Products': 2100, 'Cigarettes': 2111, 'Textile Mill Products': 2200, 'Broadwoven Fabric Mills, Cotton': 2211, 'Broadwoven Fabric Mills, Man Made Fiber & Silk': 2221, 'Knitting Mills': 2250, 'Knit Outerwear Mills': 2253, 'Carpets & Rugs': 2273, 'Apparel & Other Finished Prods of Fabrics & Similar Matl': 2300, "Men's & Boys' Furnishings, Work Clothing, & Allied Garments": 2320, "Women's, Misses', and Juniors Outerwear": 2330, "Women's, Misses', Children's & Infant's Undergarments": 2340, 'Miscellaneous Fabricated Textile Products': 2390, 'Lumber & Wood Products (No Furniture)': 2400, 'Sawmills & Planing Mills, General': 2421, 'Millwood, Veneer, Plywood, & Structural Wood Members': 2430, 'Mobile Homes': 2451, 'Prefabricated Wood Bldgs & Components': 2452, 'Household Furniture': 2510, 'Wood Household Furniture, (No Upholstered)': 2511, 'Office Furniture': 2520, 'Office Furniture (No Wood)': 2522, 'Public Bldg & Related Furniture': 2531, 'Partitions, Shelvg, Lockers, & office & Store Fixtures': 2540, 'Miscellaneous Furniture & Fixtures': 2590, 'Papers & Allied Products': 2600, 'Pulp Mills': 2611, 'Paper Mills': 2621, 'Paperboard Mills': 2631, 'Paperboard Containers & Boxes': 2650, 'Converted Paper & Paperboard Prods (No Containers/Boxes)': 2670, 'Plastics, Foil & Coated Paper Bags': 2673, 'Newspapers: Publishing or Publishing & Printing': 2711, 'Periodicals: Publishing or Publishing & Printing': 2721, 'Books: Publishing or Publishing & Printing': 2731, 'Book Printing': 2732, 'Miscellaneous Publishing': 2741, 'Commercial Printing': 2750, 'Manifold Business Forms': 2761, 'Greeting Cards': 2771, 'Blankbooks, Looseleaf Binders & Bookbinding & Related Work': 2780, 'Service Industries For The Printing Trade': 2790, 'Chemicals & Allied Products': 2800, 'Industrial Inorganic Chemicals': 2810, 'Plastic Material, Synth Resin/Rubber, Cellulos (No Glass)': 2820, 'Plastic Materials, Synth Resins & Nonvulcan Elastomers': 2821, 'Medicinal Chemicals & Botanical Products': 2833, 'Pharmaceutical Preparations': 2834, 'In Vitro & In Vivo Diagnostic Substances': 2835, 'Biological Products, (No Diagnostic Substances)': 2836, 'Soap, Detergents, Cleaning Preparations, Perfumes, Cosmeti

cs': 2840, 'Specialty Cleaning, Polishing and Sanitation Preparations': 2842, 'Perfumes, Cosmetics & Other Toilet Preparations': 2844, 'Paints, Varnishes, Lacquers, Enamels & Allied Prods': 2851, 'Industrial Organic Chemicals': 2860, 'Agricultural Chemicals': 2870, 'Miscellaneous Chemical Products': 2890, 'Adhesives & Sealants': 2891, 'Petroleum Refining': 2911, 'Asphalt Paving & Roofing Materials': 2950, 'Miscellaneous Products of Petroleum & Coal': 2990, 'Tires & Inner Tubes': 3011, 'Rubber & Plastics Footwear': 3021, 'Gaskets, Packg & Sealg Devices & Rubber & Plastics Hose': 3050, 'Fabricated Rubber Products, NEC': 3060, 'Miscellaneous Plastics Products': 3080, 'Unsupported Plastics Film & Sheet': 3081, 'Plastics Foam Products': 3086, 'Plastics Products, NEC': 3089, 'Leather & Leather Products': 3100, 'Footwear, (No Rubber)': 3140, 'Flat Glass': 3211, 'Glass & Glassware, Pressed or Blown': 3220, 'Glass Containers': 3221, 'Glass Products, Made of Purchased Glass': 3231, 'Cement, Hydraulic': 3241, 'Structural Clay Products': 3250, 'Pottery & Related Products': 3260, 'Concrete, Gypsum & Plaster Products': 3270, 'Concrete Products, Except Block & Brick': 3272, 'Cut Stone & Stone Products': 3281, 'Abrasive, Asbestos & Misc Nonmetallic Mineral Prods': 3290, 'Steel Works, Blast Furnaces & Rolling & Finishing Mills': 3310, 'Steel Works, Blast Furnaces & Rolling Mills (Coke Ovens)': 3312, 'Steel Pipe & Tubes': 3317, 'Iron & Steel Foundries': 3320, 'Primary Smelting & Refining of Nonferrous Metals': 3330, 'Primary Production of Aluminum': 3334, 'Secondary Smelting & Refining of Nonferrous Metals': 3341, 'Rolling Drawing & Extruding of Nonferrous Metals': 3350, 'Drawing & Insulating of Nonferrous Wire': 3357, 'Nonferrous Foundries (Castings)': 3360, 'Miscellaneous Primary Metal Products': 3390, 'Metal Cans': 3411, 'Metal Shipping Barrels, Drums, Kegs & Pails': 3412, 'Cutlery, Handtools & General Hardware': 3420, 'Heating Equip, Except Elec & Warm Air; & Plumbing Fixtures': 3430, 'Heating Equipment, Except Electric & Warm Air Furnaces': 3433, 'Fabricated Structural Metal Products': 3440, 'Metal Doors, Sash, Frames, Moldings & Trim': 3442, 'Fabricated Plate Work (Boiler Shops)': 3443, 'Sheet Metal Work': 3444, 'Prefabricated Metal Buildings & Components': 3448, 'Screw Machine Products': 3451, 'Bolts, Nuts, Screws, Rivets & Washers': 3452, 'Metal Forgings & Stampings': 3460, 'Coating, Engraving & Allied Services': 3470, 'Ordnance & Accessories, (No Vehicles/Guided Missiles)': 3480, 'Miscellaneous Fabricated Metal Products': 3490, 'Engines & Turbines': 3510, 'Farm Machinery & Equipment': 3523, 'Lawn & Garden Tractors & Home Lawn & Gardens Equip': 3524, 'Construction, Mining & Materials Handling Machinery & Equip': 3530, 'Construction Machinery & Equip': 3531, 'Mining Machinery & Equip (No Oil & Gas Field Mach & Equip)': 3532, 'Oil & Gas Field Machinery & Equipment': 3533, 'Industrial Trucks, Tractors, Trailers & Stackers': 3537, 'Metalworkg Machinery & Equipment': 3540, 'Machine Tools, Metal Cutting Types': 3541, 'Special Industry Machinery (No Metalworking Machinery)': 3550, 'Printing Trades Machinery & Equipment': 3555, 'Special Industry Machinery, NEC': 3559, 'General Industrial Machinery & Equipment': 3560, 'Pumps & Pumping Equipment': 3561, 'Ball & Roller Bearings': 3562, 'Industrial & Commercial Fans & Blowers & Air Purifying Equip': 3564, 'Industrial Process Furnaces & Ovens': 3567, 'General Industrial Machinery & Equipment, NEC': 3569, 'Computer & office Equipment': 3570, 'Electronic Computers': 3571, 'Computer Storage Devices': 3572, 'Computer Terminals': 3575, 'Computer Communications Equipment': 3576, 'Computer Peripheral Equipment, NEC': 3577, 'Calculating & Accounting Machines (No Electronic Computers)': 3578, 'Office Machines, NEC': 3579, 'Refrigeration & Service Industry Machinery': 3580, 'Air-Cond & Warm Air Heatg Equip & Comm & Indl Refrig Equip': 3585, 'Misc Industrial & Commercial Machinery & Equipment': 3590, 'Electronic & Other Electrical Equipment (No Computer Equip)': 3600, 'Power, Distribution & Specialty Transformers': 3612, 'Switchgear & Switchboard Apparatus': 3613, 'Electrical Industrial Apparatus': 3620, 'Motors & Generators': 3621, 'Household Appliances': 3630, 'Electric Housewares & Fans': 3634, 'Electric Lighting & Wiring Equipment': 3640, 'Household Audio & Video Equipment': 3651, 'Phonograph Records & Prerecorded Audio Tapes & Disks': 3652, 'Telephone & Telegraph Apparatus': 3661, 'Radio & TV Broadcasting & Communications Equipment': 3663, 'Communications Equipment, NEC': 3669, 'Electronic Components & Accessories': 3670, 'Printed Circuit Boards': 3672, 'Semiconductors & Related Devices': 3674, 'Electronic Coils, Transformers & Other Inductors': 3677, 'Electronic Connectors': 3678, 'Electronic Components, NEC': 3679, 'Miscellaneous Electrical Machinery, Equipment & Supplies': 3690, 'Magnetic & Optical Recording Media': 3695, 'Motor Vehicles & Passenger Car Bodies': 3711, 'Truck & Bus Bodies': 3713, 'Motor Vehicle Parts & Accessories': 3714, 'Truck Trailers': 3715, 'Motor Homes': 3716, 'Aircraft & Parts': 3720, 'Aircraft': 3721, 'Aircraft Engines & Engine Parts': 3724, 'Aircraft Parts & Auxiliary Equipment, NEC': 3728, 'Ship & Boat Building & Repairing': 3730, 'Railroad Equipment': 3743, 'Motorcycles, Bicycles & Parts': 3751, 'Guided Missiles & Space Vehicles & Parts': 3760, 'Miscellaneous Transportation Equipment': 3790, 'Search, Detection, Navigation, Guidance, Aeronautical Sys': 3812, 'Laboratory Apparatus & Furniture': 3821, 'Auto Controls For Regulating Residential & Comml Environments': 3822, 'Industrial Instruments For Measurement, Display, and Control': 3823, 'Totalizing Fluid Meter

s & Counting Devices': 3824, 'Instruments For Meas & Testing of Electricity & Elec Signals': 3825, 'Laboratory Analytical Instruments': 3826, 'Optical Instruments & Lenses': 3827, 'Measuring & Controlling Devices, NEC': 3829, 'Surgical & Medical Instruments & Apparatus': 3841, 'Orthopedic, Prosthetic & Surgical Appliances & Supplies': 3842, 'Dental Equipment & Supplies': 3843, 'X-Ray Apparatus & Tubes & Related Irradiation Apparatus': 3844, 'Electromedical & Electrotherapeutic Apparatus': 3845, 'Ophthalmic Goods': 3851, 'Photographic Equipment & Supplies': 3861, 'Watches, Clocks, Clockwork Operated Devices/Parts': 3873, 'Jewelry, Silverware & Plated Ware': 3910, 'Jewelry, Precious Metal': 3911, 'Musical Instruments': 3931, 'Dolls & Stuffed Toys': 3942, "Games, Toys & Children's Vehicles (No Dolls & Bicycles)": 3944, 'Sporting & Athletic Goods, NEC': 3949, "Pens, Pencils & Other Artists' Materials": 3950, 'Costume Jewelry & Novelties': 3960, 'Miscellaneous Manufacturing Industries': 3990, 'Railroads, Line-Haul Operating': 4011, 'Railroad Switching & Terminal Establishments': 4013, 'Local & Suburban Transit & Interurban Hwy Passenger Trans': 4100, 'Trucking & Courier Services (No Air)': 4210, 'Trucking (No Local)': 4213, 'Public Warehousing & Storage': 4220, 'Terminal Maintenance Facilities For Motor Freight Transport': 4231, 'Water Transportation': 4400, 'Deep Sea Foreign Transportation of Freight': 4412, 'Air Transportation, Scheduled': 4512, 'Air Courier Services': 4513, 'Air Transportation, Nonscheduled': 4522, 'Airports, Flying Fields & Airport Terminal Services': 4581, 'Pipe Lines (No Natural Gas)': 4610, 'Transportation Services': 4700, 'Arrangement of Transportation of Freight & Cargo': 4731, 'Radiotelephone Communications': 4812, 'Telephone Communications (No Radiotelephone)': 4813, 'Telegraph & Other Message Communications': 4822, 'Radio Broadcasting Stations': 4832, 'Television Broadcasting Stations': 4833, 'Cable & Other Pay Television Services': 4841, 'Communications Services, NEC': 4899, 'Electric, Gas & Sanitary Services': 4900, 'Electric Services': 4911, 'Natural Gas Transmission': 4922, 'Natural Gas Transmission & Distribution': 4923, 'Natural Gas Distribution': 4924, 'Electric & Other Services Combined': 4931, 'Gas & Other Services Combined': 4932, 'Water Supply': 4941, 'Sanitary Services': 4950, 'Refuse Systems': 4953, 'Hazardous Waste Management': 4955, 'Steam & Air-Conditioning Supply': 4961, 'Co-generation Services & Small Power Producers': 4991, 'Wholesale-Durable Goods': 5000, 'Wholesale-Motor Vehicles & Motor Vehicle Parts & Supplies': 5010, 'Wholesale-Motor Vehicle Supplies & New Parts': 5013, 'Wholesale-Furniture & Home Furnishings': 5020, 'Wholesale-Lumber & Other Construction Materials': 5030, 'Wholesale-Lumber, Plywood, millwork & Wood Panels': 5031, 'Wholesale-Professional & Commercial Equipment & Supplies': 5040, 'Wholesale-Computers & Peripheral Equipment & Software': 5045, 'Wholesale-Medical, Dental & Hospital Equipment & Supplies': 5047, 'Wholesale-Metals & Minerals (No Petroleum)': 5050, 'Wholesale-Metals Service Centers & Offices': 5051, 'Wholesale-Electrical Apparatus & Equipment, Wiring Supplies': 5063, 'Wholesale-Electrical Appliances, TV & Radio Sets': 5064, 'Wholesale-Electronic Parts & Equipment, NEC': 5065, 'Wholesale-Hardware & Plumbing & Heating Equipment & Supplies': 5070, 'Wholesale-Hardware': 5072, 'Wholesale-Machinery, Equipment & Supplies': 5080, 'Wholesale-Construction & Mining (No Petro) Machinery & Equip': 5082, 'Wholesale-Industrial Machinery & Equipment': 5084, 'Wholesale-Misc Durable Goods': 5090, 'Wholesale-Jewelry, Watches, Precious Stones & Metals': 5094, 'Wholesale-Durable Goods, NEC': 5099, 'Wholesale-Paper & Paper Products': 5110, "Wholesale-Drugs, Proprietaries & Druggists' Sundries": 5122, 'Wholesale-Apparel, Piece Goods & Notions': 5130, 'Wholesale-Groceries & Related Products': 5140, 'Wholesale-Groceries, General Line (merchandise)': 5141, 'Wholesale-Farm Product Raw Materials': 5150, 'Wholesale-Chemicals & Allied Products': 5160, 'Wholesale-Petroleum Bulk Stations & Terminals': 5171, 'Wholesale-Petroleum & Petroleum Products (No Bulk Stations)': 5172, 'Wholesale-Beer, Wine & Distilled Alcoholic Beverages': 5180, 'Wholesale-Miscellaneous Non-durable Goods': 5190, 'Retail-Building Materials, Hardware, Garden Supply': 5200, 'Retail-Lumber & Other Building Materials Dealers': 5211, 'Retail-Mobile Home Dealers': 5271, 'Retail-Department Stores': 5311, 'Retail-Variety Stores': 5331, 'Retail-Misc General Merchandise Stores': 5399, 'Retail-Food Stores': 5400, 'Retail-Grocery Stores': 5411, 'Retail-Convenience Stores': 5412, 'Retail-Auto Dealers & Gasoline Stations': 5500, 'Retail-Auto & Home Supply Stores': 5531, 'Boat Dealers': 5551, 'Retail-Apparel & Accessory Stores': 5600, "Retail-Women's Clothing Stores": 5621, 'Retail-Family Clothing Stores': 5651, 'Retail-Shoe Stores': 5661, 'Retail-Home Furniture, Furnishings & Equipment Stores': 5700, 'Retail-Furniture Stores': 5712, 'Retail-Radio, TV & Consumer Electronics Stores': 5731, 'Retail-Computer & Computer Software Stores': 5734, 'Retail-Record & Prerecorded Tape Stores': 5735, 'Retail-Eating & Drinking Places': 5810, 'Retail-Eating Places': 5812, 'Retail-Miscellaneous Retail': 5900, 'Retail-Drug Stores and Proprietary Stores': 5912, 'Retail-Miscellaneous Shopping Goods Stores': 5940, 'Retail-Jewelry Stores': 5944, 'Retail-Hobby, Toy & Game Shops': 5945, 'Retail-Nonstore Retailers': 5960, 'Retail-Catalog & Mail-Order Houses': 5961, 'Retail-Retail Stores, NEC': 5990, 'Pay Day Lenders': 6012, 'National Commercial Banks': 6021, 'State Commercial Banks': 6022, 'Commercial Banks, NEC': 6029, 'Savings Institutio

n, Federally Chartered': 6035, 'Savings Institutions, Not Federally Chartered': 6036, 'F
unctions Related To Depository Banking, NEC': 6099, 'Federal & Federally Sponsored Credi
t Agencies': 6111, 'Personal Credit Institutions': 6141, 'Short-Term Business Credit Ins
titutions': 6153, 'Miscellaneous Business Credit Institution': 6159, 'Mortgage Bankers &
Loan Correspondents': 6162, 'Loan Brokers': 6163, 'Finance Lessors': 6172, 'Asset-Backed
Securities': 6189, 'Finance Services': 6199, 'Security & Commodity Brokers, Dealers, Exc
hanges & Services': 6200, 'Security Brokers, Dealers & Flotation Companies': 6211, 'Comm
odity Contracts Brokers & Dealers': 6221, 'Investment Advice': 6282, 'Life Insurance': 6
311, 'Accident & Health Insurance': 6321, 'Hospital & Medical Service Plans': 6324, 'Fir
e, Marine & Casualty Insurance': 6331, 'Surety Insurance': 6351, 'Title Insurance': 636
1, 'Insurance Carriers, NEC': 6399, 'Insurance Agents, Brokers & Service': 6411, 'Real E
state': 6500, 'Real Estate Operators (No Developers) & Lessors': 6510, 'Operators of Non
residential Buildings': 6512, 'Operators of Apartment Buildings': 6513, 'Lessors of Real
Property, NEC': 6519, 'Real Estate Agents & Managers (For Others)': 6531, 'Real Estate D
ealers (For Their Own Account)': 6532, 'Land Subdividers & Developers (No Cemeteries)':
6552, 'Blank Checks': 6770, 'Oil Royalty Traders': 6792, 'Patent Owners & Lessors': 679
4, 'Mineral Royalty Traders': 6795, 'Real Estate Investment Trusts': 6798, 'Investors, N
EC': 6799, 'Hotels, Rooming Houses, Camps & Other Lodging Places': 7000, 'Hotels & Motel
s': 7011, 'Services-Personal Services': 7200, 'Services-Advertising': 7310, 'Services-Ad
vertising Agencies': 7311, 'Services-Consumer Credit Reporting, Collection Agencies': 73
20, 'Services-Mailing, Reproduction, Commercial Art & Photography': 7330, 'Services-Dire
ct Mail Advertising Services': 7331, 'Services-Photocopying and Duplicating Services': 7
334, 'Services-To Dwellings & Other Buildings': 7340, 'Services-Miscellaneous Equipment
Rental & Leasing': 7350, 'Services-Equipment Rental & Leasing, NEC': 7359, 'Services-Emp
loyment Agencies': 7361, 'Services-Help Supply Services': 7363, 'Services-Computer Progr
amming, Data Processing, Etc.': 7370, 'Services-Computer Programming Services': 7371, 'S
ervices-Prepackaged Software': 7372, 'Services-Computer Integrated Systems Design': 737
3, 'Services-Computer Processing & Data Preparation': 7374, 'Services-Computer Rental &
Leasing': 7377, 'Services-Miscellaneous Business Services': 7380, 'Services-Detective, G
uard & Armored Car Services': 7381, 'Services-Photofinishing Laboratories': 7384, 'Servi
ces-Telephone Interconnect Systems': 7385, 'Services-Business Services, NEC': 7389, 'Ser
vices-Automotive Repair, Services & Parking': 7500, 'Services-Auto Rental & Leasing (No
Drivers)': 7510, 'Services-Miscellaneous Repair Services': 7600, 'Services-Motion Pictur
e & Video Tape Production': 7812, 'Services-Allied To Motion Picture Production': 7819,
'Services-Motion Picture & Video Tape Distribution': 7822, 'Services-Allied To Motion Pi
cture Distribution': 7829, 'Services-Motion Picture Theaters': 7830, 'Services-Video Tap
e Rental': 7841, 'Services-Amusement & Recreation Services': 7900, 'Services-Racing, Inc
luding Track Operation': 7948, 'Services-Miscellaneous Amusement & Recreation': 7990, 'S
ervices-Video Game Arcades': 7994, 'Services-Gambling Transactions': 7995, 'Services-Amu
sement Parks': 7996, 'Services-Membership Sports & Recreation Clubs': 7997, 'Services-He
alth Services': 8000, 'Services-Offices & Clinics of Doctors of Medicine': 8011, 'Servic
es-Nursing & Personal Care Facilities': 8050, 'Services-Skilled Nursing Care Facilitie
s': 8051, 'Services-Hospitals': 8060, 'Services-General Medical & Surgical Hospitals, NE
C': 8062, 'Services-Medical Laboratories': 8071, 'Services-Home Health Care Services': 8
082, 'Services-Misc Health & Allied Services, NEC': 8090, 'Services-Specialty Outpatient
Facilities, NEC': 8093, 'Services-Legal Services': 8111, 'Services-Educational Service
s': 8200, 'Services-Social Services': 8300, 'Services-Child Day Care Services': 8351, 'S
ervices-Membership organizations': 8600, 'Services-Engineering, Accounting, Research, Ma
nagement': 8700, 'Services-Engineering Services': 8711, 'Services-Commercial Physical &
Biological Research': 8731, 'Services-Testing Laboratories': 8734, 'Services-Management
Services': 8741, 'Services-Management Consulting Services': 8742, 'Services-Facilities S
upport Management Services': 8744, 'Business Consulting Services, Not Elsewhere Classifi
ed': 8748, 'American Depositary Receipts': 8880, 'Foreign Governments': 8888, 'Services-
Services, NEC': 8900, 'International Affairs': 9721, 'Non-Operating Establishments': 999
5}

In [80]:
```python
# change sic description
import traceback

sic_temp = A[["sicdescription"]]
print(type(sic_temp))
sic_temp.assign(sic_num=-1)

error_rows = []
```

```python
error_dis = {}
#print(sic_temp)
for index, row in A.iterrows():
    sic = row["sicdescription"]
    try:

        try:
            num = sic_codes[sic]
            new_num = classify_sic(num, sic)
        except:
            print('use sic')
            print(sic)
            print(index)
            new_num = classify_sic(10000000, sic)
            print(new_num)

        if new_num != -1:
            print(new_num)
            sic_temp.loc[index, 'sic_num'] = new_num
        else:
            print('Error at Index + ')

    except Exception as e:
        print('errorr')
        traceback.print_exc()



#        if sic not in error_dis:
#            print(row['sicdescription'])
#            error_dis[sic] = 0

#        error_rows.append(index)
# print(len(error_dis))
# print(len(error_rows))
print(sic_temp)
#print(A)
```

```
<class 'pandas.core.frame.DataFrame'>
classify number 8200
8
use sic
Oil and Gas Field Services, Not Elsewhere Classified
1
classify number 10000000
4
4
classify number 2834
3
classify number 8060
8
use sic
Arrangement of Transportation of Freight and Cargo
4
classify number 10000000
4
4
use sic
Services-Computer Processing and Data Preparation
5
```

```
classify number 10000000
13
13
classify number 8711
8
use sic
Radio and Television Broadcasting and Communications Equipment
7
classify number 10000000
13
13
classify number 8082
8
use sic
Hotels and Motels
9
classify number 10000000
7
7
use sic
Unsupported Plastics Film and Sheet
10
classify number 10000000
3
3
classify number 5331
6
use sic
Computer Peripheral Equipment, Not Elsewhere Classified
12
classify number 10000000
13
13
use sic
Wholesale-Petroleum Bulk Stations and Terminals
13
classify number 10000000
4
4
use sic
Industrial Instruments for Measurement, Display, and Control of Process Variables and Re
lated Products
14
classify number 10000000
13
13
use sic
Communications Services, Not Elsewhere Classified
15
classify number 10000000
4
4
use sic
Semiconductors and Related Devices
16
classify number 10000000
13
13
use sic
Hotels and Motels
17
classify number 10000000
7
7
classify number 7372
```

8
classify number 7372
8
classify number 2860
3
use sic
Semiconductors and Related Devices
21
classify number 10000000
13
13
use sic
Construction Machinery and Equipment
22
classify number 10000000
2
2
use sic
Retail-Apparel and Accessory Stores
24
classify number 10000000
6
6
use sic
Arrangement of Transportation of Freight and Cargo
25
classify number 10000000
4
4
use sic
Semiconductors and Related Devices
26
classify number 10000000
13
13
use sic
Surgical and Medical Instruments and Apparatus
27
classify number 10000000
11
11
use sic
Security and Commodity Brokers, Dealers, Exchanges and Services
28
classify number 10000000
7
7
use sic
Telephone and Telegraph Apparatus
30
classify number 10000000
13
13
use sic
Motor Vehicles and Passenger Car Bodies
31
classify number 10000000
13
13
use sic
Construction-Special Trade Contractors
32
classify number 10000000
2
2

```
use sic
Services-Business Services, Not Elsewhere Classified
33
classify number 10000000
8
8
classify number 8200
8
use sic
Semiconductors and Related Devices
35
classify number 10000000
13
13
classify number 7372
8
use sic
Transportation services
37
classify number 10000000
4
4
use sic
Electromedical and Electrotherapeutic Apparatus
38
classify number 10000000
13
13
classify number 6798
7
classify number 6798
7
classify number 2834
3
use sic
Services-Business Services, Not Elsewhere Classified
42
classify number 10000000
8
8
classify number 100
0
use sic
Services-General Medical and Surgical Hospitals, Not Elsewhere Classified
44
classify number 10000000
11
11
classify number 7372
8
use sic
Services-Business Services, Not Elsewhere Classified
47
classify number 10000000
8
8
classify number 7311
8
classify number 6282
7
use sic
Crude Petroleum and Natural Gas
50
classify number 10000000
4
```

4
use sic
Crude Petroleum and Natural Gas
51
classify number 10000000
4
4
use sic
Services-Computer Processing and Data Preparation
52
classify number 10000000
13
13
classify number 2860
3
classify number 7372
8
classify number 7200
8
use sic
Motor Vehicle Parts and Accessories
56
classify number 10000000
13
13
use sic
Semiconductors and Related Devices
57
classify number 10000000
13
13
use sic
Cut Stone and Stone Products
58
classify number 10000000
2
2
classify number 4922
4
use sic
Retail-Catalog and Mail-Order Houses
60
classify number 10000000
7
7
use sic
Communications Equipment, Not Elsewhere Classified
61
classify number 10000000
13
13
use sic
General Industrial Machinery And Equipment
62
classify number 10000000
13
13
use sic
Semiconductors and Related Devices
63
classify number 10000000
13
13
use sic
Water transportation

```
64
classify number 10000000
4
4
classify number 2834
3
classify number 7370
8
classify number 7372
8
classify number 5331
6
use sic
Computer Peripheral Equipment, Not Elsewhere Classified
69
classify number 10000000
13
13
classify number 5812
6
classify number 5411
6
use sic
Surgical and Medical Instruments and Apparatus
72
classify number 10000000
11
11
classify number 5812
6
use sic
Surgical and Medical Instruments and Apparatus
74
classify number 10000000
11
11
classify number 7372
8
classify number 2810
3
use sic
Plastics Products, Not Elsewhere Classified
77
classify number 10000000
3
3
use sic
Semiconductors and Related Devices
78
classify number 10000000
13
13
use sic
Services-Computer Processing and Data Preparation
79
classify number 10000000
13
13
use sic
Real Estate Agents and Managers (For Others)
80
classify number 10000000
7
7
use sic
```

Crude Petroleum and Natural Gas
81
classify number 10000000
4
4
classify number 2911
3
classify number 4922
4
classify number 6798
7
use sic
Water transportation
86
classify number 10000000
4
4
classify number 8351
8
classify number 1531
2
classify number 2834
3
use sic
Wholesale-Lumber and Other Construction Materials
90
classify number 10000000
5
5
use sic
Printing Trades Machinery and Equipment
91
classify number 10000000
13
13
classify number 1531
2
use sic
Services-Computer Processing and Data Preparation
93
classify number 10000000
13
13
use sic
Services-Miscellaneous Amusement and Recreation
94
classify number 10000000
8
8
classify number 2834
3
use sic
Services-Business Services, Not Elsewhere Classified
96
classify number 10000000
8
8
use sic
Real estate
97
classify number 10000000
7
7
classify number 7372
8

```
use sic
Secondary Smelting and Refining of Nonferrous Metals
99
classify number 10000000
3
3
classify number 2834
3
classify number 6798
7
classify number 5411
6
classify number 2870
3
use sic
Motorcycles, Bicycles and Parts
104
classify number 10000000
13
13
use sic
Oil and Gas Field Services, Not Elsewhere Classified
105
classify number 10000000
4
4
classify number 7372
8
use sic
Computer Peripheral Equipment, Not Elsewhere Classified
107
classify number 10000000
13
13
use sic
Semiconductors and Related Devices
108
classify number 10000000
13
13
use sic
Services-Computer Processing and Data Preparation
109
classify number 10000000
13
13
classify number 6798
7
classify number 5311
6
classify number 5812
6
classify number 6798
7
use sic
Crude Petroleum and Natural Gas
114
classify number 10000000
4
4
classify number 7372
8
use sic
Services-Computer Processing and Data Preparation
116
```

classify number 10000000
13
13
use sic
Printing Trades Machinery and Equipment
117
classify number 10000000
13
13
use sic
Radio and Television Broadcasting and Communications Equipment
118
classify number 10000000
13
13
use sic
Wholesale-Petroleum Bulk Stations and Terminals
119
classify number 10000000
4
4
classify number 7311
8
classify number 6798
7
classify number 8071
8
use sic
Real Estate Agents and Managers (For Others)
123
classify number 10000000
7
7
use sic
Retail-Home Furniture, Furnishings and Equipment Stores
124
classify number 10000000
6
6
classify number 7370
8
classify number 7370
8
classify number 1531
2
classify number 8200
8
use sic
Hotels and Motels
129
classify number 10000000
7
7
use sic
Books: Publishing, or Publishing and Printing
130
classify number 10000000
8
8
classify number 2870
3
classify number 3620
3
use sic
Retail-Apparel and Accessory Stores

134
classify number 10000000
6
6
use sic
Services-Miscellaneous Amusement and Recreation
135
classify number 10000000
8
8
use sic
Services-Computer Processing and Data Preparation
136
classify number 10000000
13
13
use sic
Hotels and Motels
137
classify number 10000000
7
7
classify number 5812
6
classify number 7830
8
classify number 3576
3
use sic
Plastic Materials, Synthetic Resins and Nonvulcan Elastomers
141
classify number 10000000
13
13
use sic
Wholesale-Lumber and Other Construction Materials
142
classify number 10000000
5
5
classify number 1531
2
classify number 7372
8
classify number 2834
3
classify number 7372
8
use sic
Photographic Equipment and Supplies
147
classify number 10000000
13
13
use sic
Retail-Hobby, Toy and Game Shops
148
classify number 10000000
6
6
classify number 2834
3
use sic
Surgical and Medical Instruments and Apparatus
150

```
classify number 10000000
11
11
classify number 8071
8
use sic
Hospital and Medical Service Plans
152
classify number 10000000
12
12
use sic
Services-Computer Processing and Data Preparation
153
classify number 10000000
13
13
classify number 7372
8
classify number 4832
4
use sic
Surgical and Medical Instruments and Apparatus
156
classify number 10000000
11
11
classify number 2890
3
classify number 2834
3
classify number 5812
6
classify number 3086
3
use sic
Electric and Other Services Combined
161
classify number 10000000
13
13
use sic
Surgical and Medical Instruments and Apparatus
163
classify number 10000000
11
11
use sic
Wholesale-Metals Service Centers and Offices
164
classify number 10000000
5
5
use sic
Drilling Oil and Gas Wells
165
classify number 10000000
4
4
use sic
Orthopedic, Prosthetic, and Surgical Appliances and Supplies
166
classify number 10000000
11
11
```

```
use sic
Services-Business Services, Not Elsewhere Classified
167
classify number 10000000
8
8
classify number 2870
3
classify number 7372
8
use sic
Surgical and Medical Instruments and Apparatus
170
classify number 10000000
11
11
classify number 7372
8
classify number 2040
3
use sic
Paints, Varnishes, Lacquers, Enamels and Allied Prods
174
classify number 10000000
2
2
use sic
Retail-Catalog and Mail-Order Houses
195
classify number 10000000
7
7
classify number 7372
8
use sic
Orthopedic, Prosthetic, and Surgical Appliances and Supplies
197
classify number 10000000
11
11
use sic
Motor Vehicle Parts and Accessories
198
classify number 10000000
13
13
use sic
Services-Offices and Clinics Of Doctors Of Medicine
199
classify number 10000000
11
11
classify number 8071
8
classify number 8200
8
classify number 8741
8
use sic
Ship And Boat Building And Repairing
203
classify number 10000000
4
4
use sic
```

Services-Computer Processing and Data Preparation
204
classify number 10000000
13
13
use sic
Patent Owners and Lessors
207
classify number 10000000
9
9
classify number 7372
8
use sic
Miscellaneous Electrical Machinery, Equipment and Supplies
211
classify number 10000000
13
13
classify number 8200
8
use sic
Electromedical and Electrotherapeutic Apparatus
213
classify number 10000000
13
13
classify number 7372
8
use sic
Electronic Components, Not Elsewhere Classified
215
classify number 10000000
13
13
use sic
Engines And Turbines
216
classify number 10000000
13
13
classify number 2834
3
use sic
Surgical and Medical Instruments and Apparatus
218
classify number 10000000
11
11
classify number 7372
8
use sic
Retail-Home Furniture, Furnishings and Equipment Stores
220
classify number 10000000
6
6
use sic
Services-Commercial Physical and Biological Research
221
classify number 10000000
11
11
use sic
Radio and Television Broadcasting and Communications Equipment

222
classify number 10000000
13
13
classify number 7372
8
use sic
Perfumes, Cosmetics and Other Toilet Preparations
224
classify number 10000000
6
6
classify number 100
0
use sic
Services-Business Services, Not Elsewhere Classified
228
classify number 10000000
8
8
classify number 8071
8
classify number 7372
8
classify number 7370
8
use sic
Mining and Quarrying Of Nonmetallic Minerals (No Fuels)
232
classify number 10000000
1
1
use sic
Miscellaneous Electrical Machinery, Equipment and Supplies
233
classify number 10000000
13
13
use sic
Semiconductors and Related Devices
234
classify number 10000000
13
13
use sic
Services-Computer Processing and Data Preparation
235
classify number 10000000
13
13
use sic
Real Estate Operators (No Developers) and Lessors
236
classify number 10000000
7
7
classify number 8200
8
classify number 6798
7
classify number 7370
8
use sic
Women's, Misses', and Juniors' Outerwear
240

classify number 10000000
13
13
classify number 3221
3
use sic
Oil and Gas Field Services, Not Elsewhere Classified
242
classify number 10000000
4
4
classify number 7372
8
classify number 6199
7
classify number 4213
4
use sic
Services-Computer Processing and Data Preparation
247
classify number 10000000
13
13
use sic
Bituminous Coal And Lignite Mining
248
classify number 10000000
1
1
use sic
Oil and Gas Field Services, Not Elsewhere Classified
249
classify number 10000000
4
4
use sic
Retail-Lumber and Other Building Materials Dealers
250
classify number 10000000
6
6
use sic
Retail-Auto Dealers and Gasoline Stations
251
classify number 10000000
6
6
use sic
Oil and Gas Field Services, Not Elsewhere Classified
252
classify number 10000000
4
4
use sic
Services-Business Services, Not Elsewhere Classified
253
classify number 10000000
8
8
classify number 2870
3
use sic
Wholesale-Drugs, Proprietaries and Druggists' Sundries
255
classify number 10000000

11
11
classify number 4950
4
use sic
Real Estate Agents and Managers (For Others)
257
classify number 10000000
7
7
classify number 3490
3
use sic
Transportation services
259
classify number 10000000
4
4
use sic
Food and kindred products
260
classify number 10000000
6
6
use sic
Retail-Retail Stores, Not Elsewhere Classified
261
classify number 10000000
6
6
classify number 8200
8
use sic
Cable and Other Pay Television Services
263
classify number 10000000
13
13
use sic
Chemicals and Allied Products
264
classify number 10000000
3
3
classify number 3241
3
classify number 7372
8
use sic
Games, Toys and Children's Vehicles (No Dolls and Bicycles)
267
classify number 10000000
6
6
use sic
Refrigeration And Service Industry Machinery
268
classify number 10000000
13
13
use sic
Special Industry Machinery, Not Elsewhere Classified
269
classify number 10000000
13

```
13
classify number 7371
8
classify number 7372
8
classify number 7370
8
classify number 7372
8
use sic
Real Estate Agents and Managers (For Others)
274
classify number 10000000
7
7
use sic
Abrasive, Asbestos and Miscellaneous Nonmetallic Mineral Products
275
classify number 10000000
3
3
classify number 8200
8
classify number 7372
8
classify number 7371
8
classify number 3620
3
use sic
Semiconductors and Related Devices
280
classify number 10000000
13
13
classify number 7372
8
classify number 7372
8
use sic
Surgical and Medical Instruments and Apparatus
284
classify number 10000000
11
11
classify number 2834
3
classify number 1600
2
classify number 7370
8
classify number 7370
8
use sic
Services-Business Services, Not Elsewhere Classified
289
classify number 10000000
8
8
```

C:\Users\jchen\Miniconda3\envs\ml_hw4\lib\site-packages\pandas\core\indexing.py:1599: Se
ttingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_

guide/indexing.html#returning-a-view-versus-a-copy
  self.obj[key] = infer_fill_value(value)
C:\Users\jchen\Miniconda3\envs\ml_hw4\lib\site-packages\pandas\core\indexing.py:1720: Se
ttingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_
guide/indexing.html#returning-a-view-versus-a-copy
  self._setitem_single_column(loc, value, pi)
use sic
Services-Business Services, Not Elsewhere Classified
290
classify number 10000000
8
8
classify number 7372
8
classify number 4955
4
classify number 4213
4
classify number 8200
8
classify number 7372
8
use sic
Services-Business Services, Not Elsewhere Classified
296
classify number 10000000
8
8
classify number 2834
3
use sic
Electromedical and Electrotherapeutic Apparatus
298
classify number 10000000
13
13
use sic
Services-Auto Rental and Leasing (No Drivers)
299
classify number 10000000
9
9
use sic
Services-Business Services, Not Elsewhere Classified
300
classify number 10000000
8
8
classify number 5712
6
classify number 5331
6
use sic
Surgical and Medical Instruments and Apparatus
303
classify number 10000000
11
11
classify number 700
0
use sic

Medicinal Chemicals and Botanical Products
305
classify number 10000000
11
11
classify number 3620
3
classify number 2834
3
classify number 7370
8
classify number 2836
3
classify number 7372
8
use sic
Crude Petroleum and Natural Gas
313
classify number 10000000
4
4
classify number 7372
8
use sic
Semiconductors and Related Devices
315
classify number 10000000
13
13
classify number 7371
8
use sic
Household Audio and Video Equipment
317
classify number 10000000
13
13
use sic
Real estate
318
classify number 10000000
7
7
use sic
Household Audio and Video Equipment
319
classify number 10000000
13
13
classify number 2834
3
classify number 4512
4
classify number 7372
8
use sic
Services-Computer Processing and Data Preparation
323
classify number 10000000
13
13
classify number 8071
8
use sic
Chemicals and Allied Products

325
classify number 10000000
3
3
classify number 7372
8
use sic
Surgical and Medical Instruments and Apparatus
327
classify number 10000000
11
11
use sic
Hotels and Motels
328
classify number 10000000
7
7
use sic
Motor Vehicles and Passenger Car Bodies
329
classify number 10000000
13
13
classify number 7372
8
use sic
Services-Computer Processing and Data Preparation
331
classify number 10000000
13
13
use sic
Sporting and Athletic Goods, Not Elsewhere Classified
332
classify number 10000000
7
7
classify number 2836
3
use sic
Surgical and Medical Instruments and Apparatus
334
classify number 10000000
11
11
use sic
Services-Business Services, Not Elsewhere Classified
335
classify number 10000000
8
8
classify number 4832
4
classify number 2451
3
classify number 6282
7
classify number 2834
3
classify number 4924
4
use sic
Surgical and Medical Instruments and Apparatus
341

classify number 10000000
11
11
use sic
Apparel and Other Finished Products of Fabrics and Similar Material
342
classify number 10000000
13
13
use sic
Services-Business Services, Not Elsewhere Classified
343
classify number 10000000
8
8
classify number 6282
7
use sic
Services-Computer Processing and Data Preparation
345
classify number 10000000
13
13
use sic
Food and kindred products
346
classify number 10000000
6
6
use sic
Retail-Retail Stores, Not Elsewhere Classified
347
classify number 10000000
6
6
use sic
Services-Computer Processing and Data Preparation
348
classify number 10000000
13
13
classify number 8742
8
classify number 7373
8
classify number 7363
8
use sic
Metal Forgings And Stampings
352
classify number 10000000
3
3
use sic
Services-Business Services, Not Elsewhere Classified
353
classify number 10000000
8
8
use sic
Telephone and Telegraph Apparatus
354
classify number 10000000
13
13

classify number 7372
8
classify number 3826
3
classify number 7370
8
classify number 8200
8
classify number 8071
8
use sic
Electric and Other Services Combined
360
classify number 10000000
13
13
classify number 7370
8
use sic
Games, Toys and Children's Vehicles (No Dolls and Bicycles)
362
classify number 10000000
6
6
use sic
Drilling Oil and Gas Wells
363
classify number 10000000
4
4
classify number 7372
8
classify number 5812
6
use sic
Electromedical and Electrotherapeutic Apparatus
366
classify number 10000000
13
13
use sic
Real estate
368
classify number 10000000
7
7
use sic
Real Estate Operators (No Developers) and Lessors
369
classify number 10000000
7
7
classify number 8071
8
use sic
Services-Business Services, Not Elsewhere Classified
371
classify number 10000000
8
8
use sic
Surgical and Medical Instruments and Apparatus
372
classify number 10000000
11

11
use sic
Retail-Catalog and Mail-Order Houses
373
classify number 10000000
7
7
use sic
Services-Computer Processing and Data Preparation
374
classify number 10000000
13
13
use sic
Semiconductors and Related Devices
375
classify number 10000000
13
13
use sic
Semiconductors and Related Devices
376
classify number 10000000
13
13
use sic
Retail-Auto Dealers and Gasoline Stations
377
classify number 10000000
6
6
use sic
Aircraft Parts and Auxiliary Equipment, Not Elsewhere Classified
378
classify number 10000000
13
13
classify number 7370
8
classify number 7372
8
use sic
Crude Petroleum and Natural Gas
381
classify number 10000000
4
4
use sic
Services-Business Services, Not Elsewhere Classified
382
classify number 10000000
8
8
use sic
Services-Commercial Physical and Biological Research
383
classify number 10000000
11
11
classify number 2510
3
classify number 2834
3
use sic
Retail-Auto and Home Supply Stores

```
386
classify number 10000000
6
6
classify number 8200
8
classify number 8200
8
classify number 7372
8
use sic
Insurance Agents, Brokers and Service
391
classify number 10000000
7
7
use sic
Surgical and Medical Instruments and Apparatus
392
classify number 10000000
11
11
use sic
Services-Amusement and Recreation Services
393
classify number 10000000
8
8
classify number 7372
8
use sic
Services-Business Services, Not Elsewhere Classified
395
classify number 10000000
8
8
classify number 7370
8
use sic
Retail-Auto Dealers and Gasoline Stations
397
classify number 10000000
6
6
use sic
Communications Services, Not Elsewhere Classified
398
classify number 10000000
4
4
classify number 8071
8
use sic
Plastics Products, Not Elsewhere Classified
400
classify number 10000000
3
3
classify number 8071
8
classify number 8071
8
classify number 5411
6
classify number 7372
```

8
use sic
Semiconductors and Related Devices
405
classify number 10000000
13
13
use sic
Services-Computer Processing and Data Preparation
406
classify number 10000000
13
13
use sic
Services-Business Services, Not Elsewhere Classified
407
classify number 10000000
8
8
classify number 7372
8
use sic
Insurance Agents, Brokers and Service
409
classify number 10000000
7
7
classify number 2834
3
classify number 3826
3
classify number 8742
8
classify number 8200
8
classify number 7372
8
classify number 8200
8
use sic
Food and kindred products
417
classify number 10000000
6
6
use sic
Retail-Home Furniture, Furnishings and Equipment Stores
418
classify number 10000000
6
6
use sic
Real Estate Agents and Managers (For Others)
419
classify number 10000000
7
7
classify number 7372
8
classify number 7370
8
classify number 8000
8
use sic
Surgical and Medical Instruments and Apparatus

423
classify number 10000000
11
11
use sic
Real Estate Agents and Managers (For Others)
424
classify number 10000000
7
7
classify number 6798
7
classify number 7372
8
use sic
Motor Vehicles and Passenger Car Bodies
427
classify number 10000000
13
13
classify number 1531
2
use sic
Electric Lighting And Wiring Equipment
430
classify number 10000000
13
13
use sic
Electromedical and Electrotherapeutic Apparatus
431
classify number 10000000
13
13
classify number 7372
8
use sic
Plastics, Foil and Coated Paper Bags
433
classify number 10000000
3
3
classify number 7372
8
classify number 6798
7
use sic
Services-Business Services, Not Elsewhere Classified
436
classify number 10000000
8
8
classify number 7372
8
use sic
Services-Computer Processing and Data Preparation
438
classify number 10000000
13
13
classify number 7372
8
use sic
Food and kindred products
440

```
classify number 10000000
6
6
classify number 7373
8
use sic
Perfumes, Cosmetics and Other Toilet Preparations
445
classify number 10000000
6
6
classify number 2834
3
use sic
Services-Miscellaneous Health and Allied Services, Not Elsewhere Classified
447
classify number 10000000
11
11
use sic
Ship And Boat Building And Repairing
448
classify number 10000000
4
4
use sic
Retail-Catalog and Mail-Order Houses
449
classify number 10000000
7
7
                                    sicdescription  sic_num
0                    Services-Educational Services      8.0
1    Oil and Gas Field Services, Not Elsewhere Clas...    4.0
2                    Pharmaceutical Preparations          3.0
3                         Services-Hospitals             8.0
4    Arrangement of Transportation of Freight and C...   4.0
..                                              ...      ...
445  Perfumes, Cosmetics and Other Toilet Preparations   6.0
446                   Pharmaceutical Preparations        3.0
447  Services-Miscellaneous Health and Allied Servi...  11.0
448              Ship And Boat Building And Repairing    4.0
449                   Retail-Catalog and Mail-Order Houses  7.0

[406 rows x 2 columns]
```

In [81]:
```python
A = A.drop(columns = ['sicdescription'])

sic_temp_n = sic_temp['sic_num']
A= A.assign(sic_num = sic_temp_n.values)
```

In [85]:
```python
A
```

Out[85]:

	share_price	shares_offered	dollar_value_of_shares	employees	shares_outstanding	stock_valuation
0	10.5	13500000.0	1.417500e+08	2971	53139723.0	5.579671e+08
1	6.0	1700000.0	1.020000e+07	96	3951811.0	2.371087e+07
2	17.0	5000000.0	8.500000e+07	59	17091191.0	2.905502e+08
3	10.0	30000000.0	3.000000e+08	21700	156092873.0	1.560929e+09

	share_price	shares_offered	dollar_value_of_shares	employees	shares_outstanding	stock_valuation
4	14.0	5700000.0	7.980000e+07	553	21493655.0	3.009112e+08
...	...	...	...	...	...	...
445	10.5	58750000.0	6.168750e+08	3355	58750000.0	6.168750e+08
446	27.0	60000000.0	1.620000e+09	390	88965664.0	2.402073e+09
447	23.0	46600000.0	1.071800e+09	2900	277431755.0	6.380930e+09
448	10.0	2400000.0	2.400000e+07	14	7577677.0	7.577677e+07
449	30.0	33000000.0	9.900000e+08	13432	179230154.0	5.376905e+09

406 rows × 18 columns

In [83]:
```python
from sklearn.cluster import DBSCAN

A.isnull().any()


# for index, row in A.iterrows():
#     sic = row["sic_num"]
#     #print("Index " + str(index) + " " + str(sic))
#     if str(sic) == 'nan':
#         print("NAN " + str(index))



#X = A.values.astype(np.float)
```

Out[83]:
```
share_price               False
shares_offered            False
dollar_value_of_shares    False
employees                 False
shares_outstanding        False
stock_valuation           False
ebit                      False
grossprofit               False
netincome                 False
totalrevenue              False
costofrevenue             False
totalassets               False
revenue_growth            False
day_1_change              False
day_2_change              False
day_3_change              False
day_4_change              False
sic_num                   False
dtype: bool
```

In [84]:
```python
model = DBSCAN(eps = 0.7, min_samples=10).fit(A)

print(model)
```

```
DBSCAN(eps=0.7, min_samples=10)
```

```
In [40]:  %matplotlib inline
          from pylab import rcParams
          rcParams['figure.figsize'] = 5,4
          import seaborn as sb
          sb.set_style('whitegrid')
```

```
In [41]:  from collections import Counter
          outliers_df = pd.DataFrame(A)
          print(Counter(model.labels_))
          print(outliers_df[model.labels_==-1])
```

```
Counter({-1: 406})
     share_price  shares_offered  dollar_value_of_shares  employees  \
0           10.5      13500000.0              1.417500e+08       2971
1            6.0       1700000.0              1.020000e+07         96
2           17.0       5000000.0              8.500000e+07         59
3           10.0      30000000.0              3.000000e+08      21700
4           14.0       5700000.0              7.980000e+07        553
..           ...             ...                       ...        ...
445         10.5      58750000.0              6.168750e+08       3355
446         27.0      60000000.0              1.620000e+09        390
447         23.0      46600000.0              1.071800e+09       2900
448         10.0       2400000.0              2.400000e+07         14
449         30.0      33000000.0              9.900000e+08      13432

     shares_outstanding  stock_valuation          ebit   grossprofit  \
0            53139723.0     5.579671e+08    33420000.0   155468000.0
1             3951811.0     2.371087e+07     2436607.0     3789779.0
2            17091191.0     2.905502e+08     7282221.0    32029488.0
3           156092873.0     1.560929e+09   196408000.0   361521000.0
4            21493655.0     3.009112e+08     4945195.0    43090276.0
..                  ...              ...           ...           ...
445          58750000.0     6.168750e+08    20638000.0   276736000.0
446          88965664.0     2.402073e+09    23988000.0    76291000.0
447         277431755.0     6.380930e+09   183597000.0   395431000.0
448           7577677.0     7.577677e+07      333700.0     1285364.0
449         179230154.0     5.376905e+09  -300000000.0   181000000.0

          netincome    totalrevenue   costofrevenue     totalassets  revenue_growth  \
0        26431000.0    2.182900e+08    6.282200e+07    1.292460e+08        1.546874
1         1691949.0    9.592261e+06    5.802482e+06    8.933083e+06        0.262541
2         4766249.0    3.507516e+07    3.045672e+06    3.111919e+07        0.249846
3        22441000.0    2.153362e+09    1.791841e+09    2.562425e+09        0.081186
4         2875556.0    2.028076e+08    1.597174e+08    4.590902e+07        1.124508
..              ...             ...             ...             ...             ...
445      10055000.0    4.351560e+08    1.584200e+08    2.886020e+08        3.702610
446      -4470000.0    1.431400e+08    6.684900e+07    5.777960e+08        0.155912
447     -20850000.0    7.783270e+08    3.828960e+08    2.580674e+09        0.043125
448        233066.0    2.869377e+06    1.584013e+06    1.914562e+06        1.256569
449    -299000000.0    9.680000e+08    7.860000e+08    6.190000e+08        0.802607

       day_1_change  day_2_change  day_3_change  day_4_change  sic_num
0          8.558559     -0.331950     -2.997502     -5.579399      8.0
1          6.822262      8.739496     14.528594     23.346829      4.0
2          1.010101      0.264706     -0.205339     -1.234568      3.0
3          3.567889     -3.444976     -0.198216     -0.695134      8.0
4         -0.426743      0.000000     -3.500000     -3.923020      4.0
..              ...           ...           ...           ...      ...
445        8.858696     -8.936595     -5.975877     -1.690962      6.0
446       -2.847571     -9.344828      2.548498      8.160237      3.0
447       11.354582     -3.398927     -0.888889      4.521674     11.0
448       -1.592798     -0.633357     -6.869688     -2.737643      4.0
```

```
449      -2.911896       2.537811       0.050000       0.424788       7.0
```

[406 rows x 18 columns]

In [56]:
```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid


# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'sic_num'], A.loc[:,"day_4_change"], c=y_kmeans, s=400)

ax.set_xlabel('Industry Number')

ax.set_ylabel("Day 4 Percentage Change in Price")

plt.title("DBSCAN plot between Industry Number and Day 4 Percentage Change in Price ")

# show centroid centres as grey circle opacity 50%
#centers = model.labels
# plt.scatter(centers[:, 16], centers[:, 17], c='black', s=200, alpha=0.5)
```
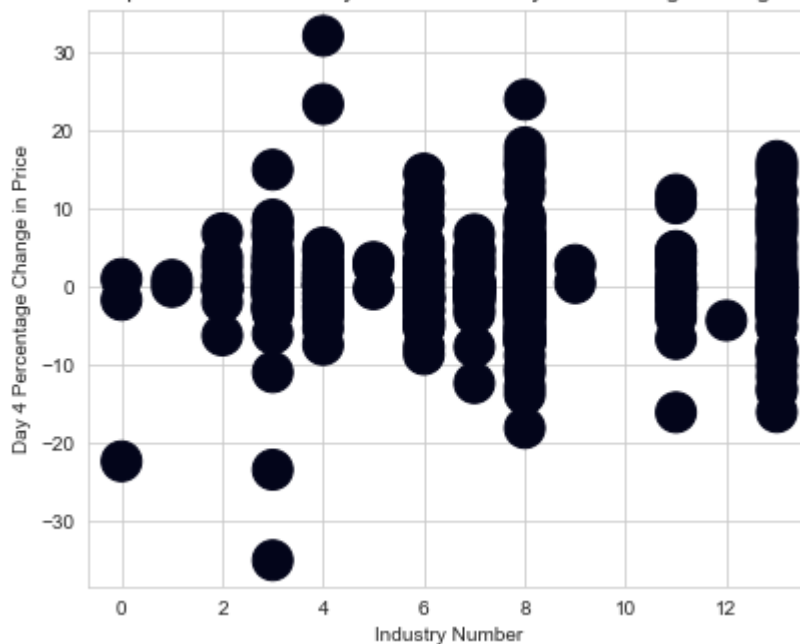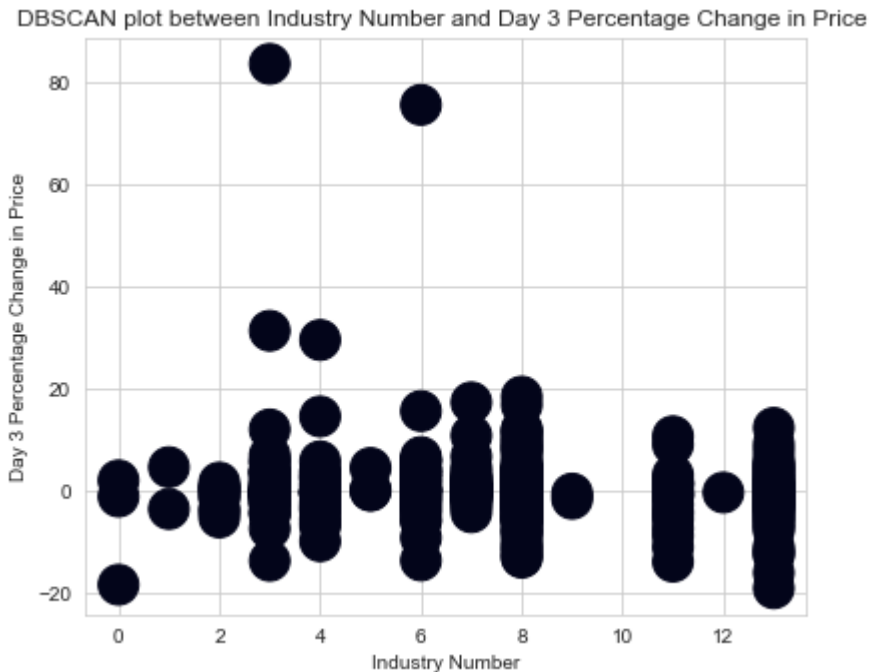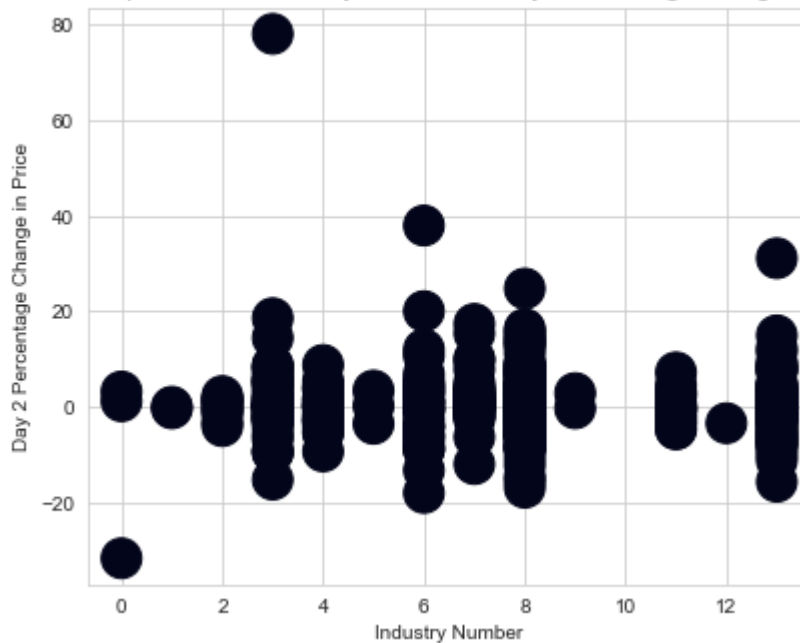
Out[56]: Text(0.5, 1.0, 'DBSCAN plot between Industry Number and Day 4 Percentage Change in Price
')

DBSCAN plot between Industry Number and Day 4 Percentage Change in Price

In [53]:
```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid
```

```
# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'sic_num'], A.loc[:,"day_3_change"], c=y_kmeans, s=400)

ax.set_xlabel('Industry Number')

ax.set_ylabel("Day 3 Percentage Change in Price")

plt.title("DBSCAN plot between Industry Number and Day 3 Percentage Change in Price ")
```

Out[53]: Text(0.5, 1.0, 'DBSCAN plot between Industry Number and Day 3 Percentage Change in Price
')

DBSCAN plot between Industry Number and Day 3 Percentage Change in Price

In [54]:
```
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid

# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'sic_num'], A.loc[:,"day_2_change"], c=y_kmeans, s=400)

ax.set_xlabel('Industry Number')

ax.set_ylabel("Day 2 Percentage Change in Price")

plt.title("DBSCAN plot between Industry Number and Day 2 Percentage Change in Price ")
```
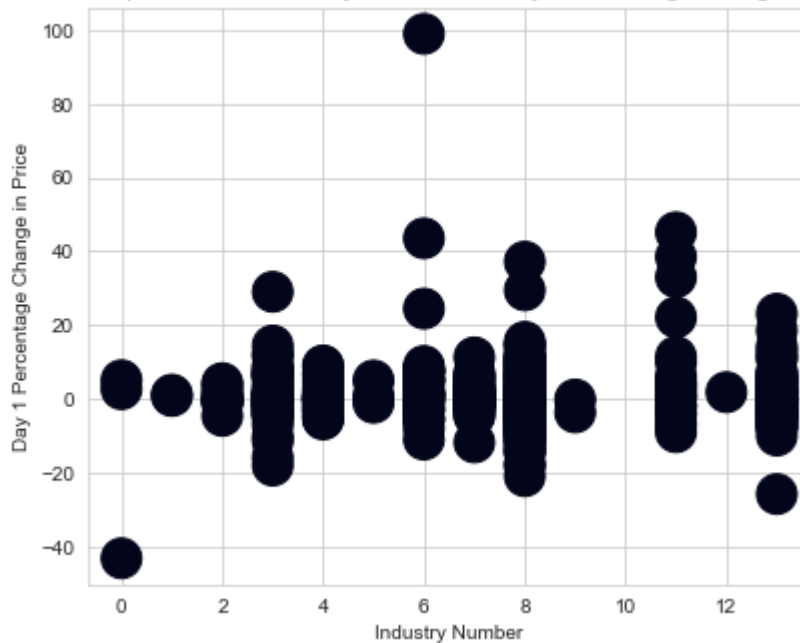
Out[54]: Text(0.5, 1.0, 'DBSCAN plot between Industry Number and Day 2 Percentage Change in Price
')

DBSCAN plot between Industry Number and Day 2 Percentage Change in Price

In [57]:

```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid

# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'sic_num'], A.loc[:,"day_1_change"], c=y_kmeans, s=400)

ax.set_xlabel('Industry Number')

ax.set_ylabel("Day 1 Percentage Change in Price")

plt.title("DBSCAN plot between Industry Number and Day 1 Percentage Change in Price ")
```

Out[57]: Text(0.5, 1.0, 'DBSCAN plot between Industry Number and Day 1 Percentage Change in Price
')

DBSCAN plot between Industry Number and Day 1 Percentage Change in Price

In [58]:
```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid


# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'share_price'], A.loc[:,"day_2_change"], c=y_kmeans, s=400)

ax.set_xlabel('Initial Price Offering')

ax.set_ylabel("Day 2 Percentage Change in Price")

plt.title("DBSCAN plot between Initial Price Offering and Day 2 Percentage Change in Pr
```
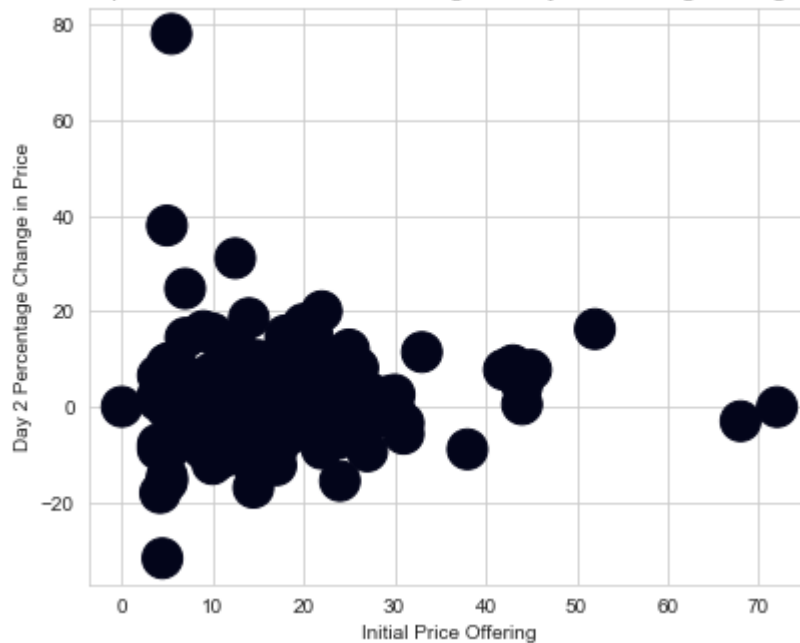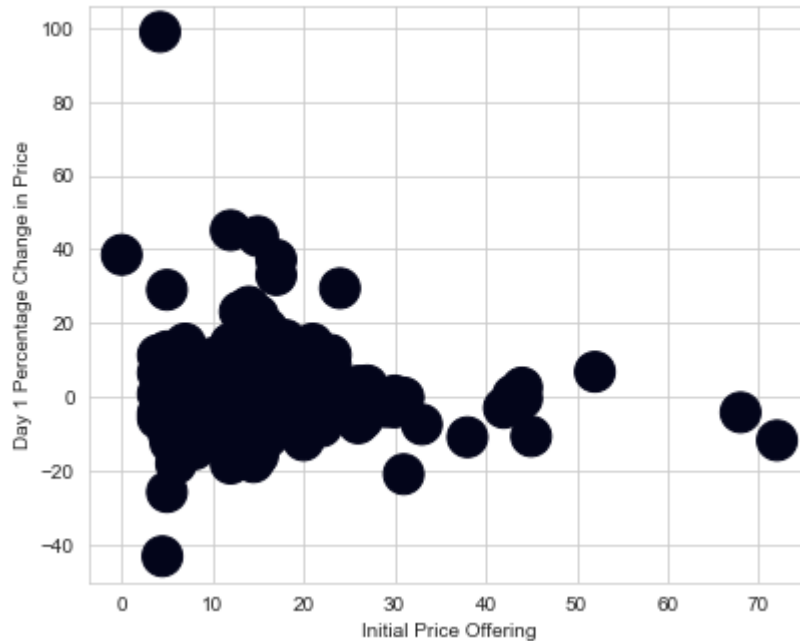
Out[58]: Text(0.5, 1.0, 'DBSCAN plot between Initial Price Offering and Day 2 Percentage Change i
          n Price ')

DBSCAN plot between Initial Price Offering and Day 2 Percentage Change in Price

In [59]:
```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid

# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'share_price'], A.loc[:,"day_1_change"], c=y_kmeans, s=400)

ax.set_xlabel('Initial Price Offering')

ax.set_ylabel("Day 1 Percentage Change in Price")

plt.title("DBSCAN plot between Initial Price Offering and Day 1 Percentage Change in Pr
```
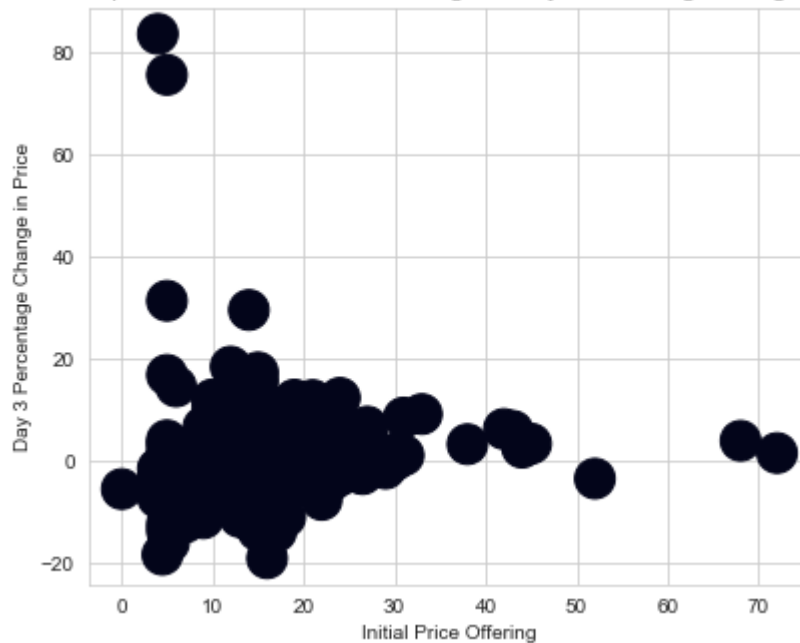
Out[59]: Text(0.5, 1.0, 'DBSCAN plot between Initial Price Offering and Day 1 Percentage Change i
n Price ')

DBSCAN plot between Initial Price Offering and Day 1 Percentage Change in Price

In [60]:
```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid


# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'share_price'], A.loc[:,"day_3_change"], c=y_kmeans, s=400)

ax.set_xlabel('Initial Price Offering')

ax.set_ylabel("Day 3 Percentage Change in Price")

plt.title("DBSCAN plot between Initial Price Offering and Day 3 Percentage Change in Pr
```

Out[60]: Text(0.5, 1.0, 'DBSCAN plot between Initial Price Offering and Day 3 Percentage Change i
n Price ')

DBSCAN plot between Initial Price Offering and Day 3 Percentage Change in Price

In [61]:
```python
fig = plt.figure()

ax = fig.add_axes([.1,.1,1,1])

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid

# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter(A.loc[:, 'share_price'], A.loc[:,"day_4_change"], c=y_kmeans, s=400)

ax.set_xlabel('Initial Price Offering')

ax.set_ylabel("Day 4 Percentage Change in Price")

plt.title("DBSCAN plot between Initial Price Offering and Day 4 Percentage Change in Pr
```
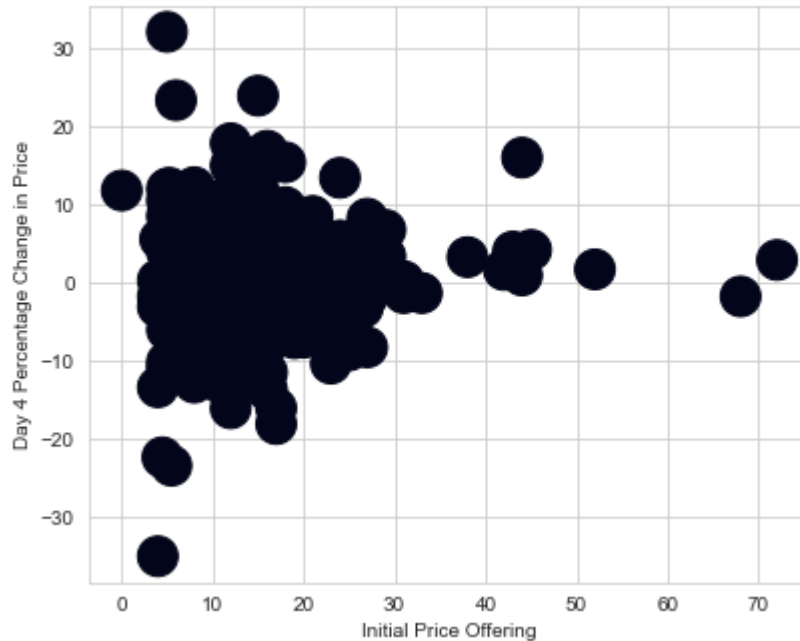
Out[61]: Text(0.5, 1.0, 'DBSCAN plot between Initial Price Offering and Day 4 Percentage Change i
n Price ')

DBSCAN plot between Initial Price Offering and Day 4 Percentage Change in Price

In [68]:
```python
fig = plt.figure()

ax = plt.axes(projection="3d")

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid

# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter3D(A.loc[:, 'sic_num'],A.loc[:, 'revenue_growth'] ,A.loc[:,"day_4_change"], c

ax.set_xlabel('Industry Number')

ax.set_ylabel('Revenue Growth')

ax.set_zlabel("Day 4 Percentage Change in Price")

plt.title("DBSCAN plot of  Industry Number, Revenue Growth, and Day 4 Percentage Change
```
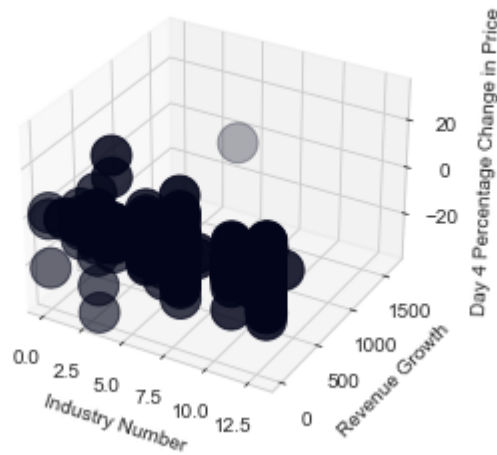
Out[68]: Text(0.5, 0.92, 'DBSCAN plot of Industry Number, Revenue Growth, and Day 4 Percentage C
hange in Price')

DBSCAN plot of Industry Number, Revenue Growth, and Day 4 Percentage Change in Price

In [69]:
```python
fig = plt.figure()

ax = plt.axes(projection="3d")

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid


# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter3D(A.loc[:, 'sic_num'],A.loc[:, 'revenue_growth'] ,A.loc[:,"day_1_change"], c

ax.set_xlabel('Industry Number')

ax.set_ylabel('Revenue Growth')

ax.set_zlabel("Day 1 Percentage Change in Price")

plt.title("DBSCAN plot of  Industry Number, Revenue Growth, and Day 1 Percentage Change
```
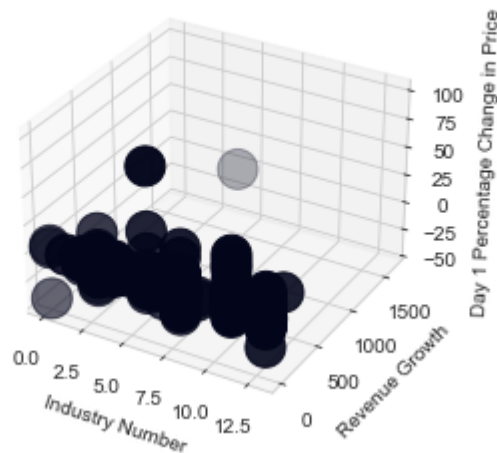
Out[69]: Text(0.5, 0.92, 'DBSCAN plot of Industry Number, Revenue Growth, and Day 1 Percentage C
         hange in Price')

DBSCAN plot of Industry Number, Revenue Growth, and Day 1 Percentage Change in Price

In [70]:
```python
fig = plt.figure()
```

```python
ax = plt.axes(projection="3d")

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid


# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter3D(A.loc[:, 'sic_num'],A.loc[:, 'revenue_growth'] ,A.loc[:,"day_2_change"], c

ax.set_xlabel('Industry Number')

ax.set_ylabel('Revenue Growth')

ax.set_zlabel("Day 2 Percentage Change in Price")

plt.title("DBSCAN plot of  Industry Number, Revenue Growth, and Day 2 Percentage Change
```
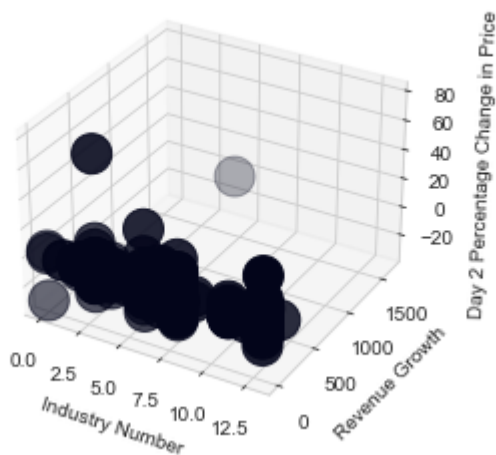
Out[70]: Text(0.5, 0.92, 'DBSCAN plot of Industry Number, Revenue Growth, and Day 2 Percentage C
hange in Price')

DBSCAN plot of Industry Number, Revenue Growth, and Day 2 Percentage Change in Price

In [71]:
```python
fig = plt.figure()

ax = plt.axes(projection="3d")

colors = model.labels_

y_kmeans = model.fit_predict(A) # this give the cluster number of the nearest centroid


# scatter plot the petal length (column 2), petal width (column 3)
ax.scatter3D(A.loc[:, 'sic_num'],A.loc[:, 'revenue_growth'] ,A.loc[:,"day_3_change"], c

ax.set_xlabel('Industry Number')

ax.set_ylabel('Revenue Growth')

ax.set_zlabel("Day 3 Percentage Change in Price")

plt.title("DBSCAN plot of  Industry Number, Revenue Growth, and Day 3 Percentage Change
```
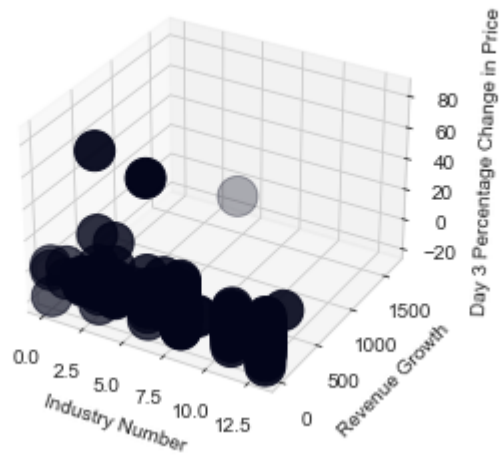
Out[71]: Text(0.5, 0.92, 'DBSCAN plot of Industry Number, Revenue Growth, and Day 3 Percentage C
hange in Price')

DBSCAN plot of Industry Number, Revenue Growth, and Day 3 Percentage Change in Price

In [74]:
```
data_1 = pd.read_csv("./data_collection_part1\part_1_data\companies_years_2009_2020_p1_
data_1
```

Out[74]:

	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_p
0	Mead Johnson Nutrition CO	MJN	New York Stock Exchange	24.00	30,000,000	$720,000,000	2009-(
1	NIVS IntelliMedia Technology Group, Inc.	NIV	New York Stock Exchange	3.50	550,000	$1,925,000	2009-(
2	Changyou.com Ltd	CYOU	Nasdaq National Market	16.00	7,500,000	$120,000,000	2009-(
3	Zovio Inc	ZVO	New York Stock Exchange	10.50	13,500,000	$141,750,000	2009-(
4	ROSETTA STONE INC	RST	New York Stock Exchange	18.00	6,250,000	$112,500,000	2009-(
...	...	...	...	...	...	...	
1553	Ozon Holdings PLC	OZON	NASDAQ Global Select	30.00	33,000,000	$990,000,000	2020-`
1554	Spartan Acquisition Corp. II	SPRQU	NYSE	10.00	30,000,000	$300,000,000	2020-`
1555	Forest Road Acquisition Corp.	FRX'U	NYSE	10.00	26,100,000	$261,000,000	2020-`
1556	LIXTE BIOTECHNOLOGY HOLDINGS, INC.	LIXT	NASDAQ Capital	4.75	1,200,000	$5,700,000	2020-`

	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_p
1557	Seaport Global Acquisition Corp	SGAMU	NASDAQ Capital	10.00	12,500,000	$125,000,000	2020-

1558 rows × 8 columns

In [75]:
```
data_2 = pd.read_csv("./data_collection_part1\part_2_data\companies_years_2009_2020_p2_
data_2
```

Out[75]:

	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_pric
0	Mead Johnson Nutrition CO	MJN	New York Stock Exchange	24.0	30,000,000	$720,000,000	2009-02-
1	NIVS IntelliMedia Technology Group, Inc.	NIV	New York Stock Exchange	3.5	550,000	$1,925,000	2009-03-
2	Changyou.com Ltd	CYOU	Nasdaq National Market	16.0	7,500,000	$120,000,000	2009-04-
3	Zovio Inc	ZVO	New York Stock Exchange	10.5	13,500,000	$141,750,000	2009-04-
4	ROSETTA STONE INC	RST	New York Stock Exchange	18.0	6,250,000	$112,500,000	2009-04-
...	...	...	...	...	...	...	
1079	MARAVAI LIFESCIENCES HOLDINGS, INC.	MRVI	NASDAQ Global Select	27.0	60,000,000	$1,620,000,000	2020-11-
1080	Sotera Health Co	SHC	NASDAQ Global Select	23.0	46,600,000	$1,071,800,000	2020-11-
1081	Vision Marine Technologies Inc.	VMAR	NASDAQ Capital	10.0	2,400,000	$24,000,000	2020-11-
1082	Alset EHome International Inc.	HFEN	NASDAQ Capital	7.0	2,160,000	$15,120,000	2020-11-

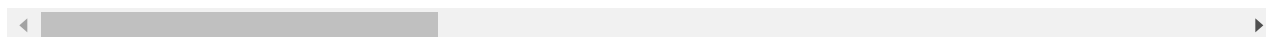|	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_pric
1083	Ozon Holdings PLC	OZON	NASDAQ Global Select	30.0	33,000,000	$990,000,000	2020-11-

1084 rows × 13 columns

In [76]:
```
data_3 = pd.read_csv("./data_collection_part1\part_3_data\companies_years_2009_2020_p3_
data_3
```

Out[76]:

	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_pr
0	Zovio Inc	ZVO	New York Stock Exchange	10.5	13,500,000	$141,750,000	2009-0
1	Recon Technology, Ltd	RCON	Nasdaq SmallCap Market	6.0	1,700,000	$10,200,000	2009-0
2	CUMBERLAND PHARMACEUTICALS INC	CPIX	Nasdaq National Market	17.0	5,000,000	$85,000,000	2009-0
3	SELECT MEDICAL HOLDINGS CORP	SEM	New York Stock Exchange	10.0	30,000,000	$300,000,000	2009-0
4	Echo Global Logistics, Inc.	ECHO	Nasdaq National Market	14.0	5,700,000	$79,800,000	2009-1
...	...	...	...	...	...	...	
445	Yatsen Holding Ltd	YSG	NYSE	10.5	58,750,000	$616,875,000	2020-1
446	MARAVAI LIFESCIENCES HOLDINGS, INC.	MRVI	NASDAQ Global Select	27.0	60,000,000	$1,620,000,000	2020-1
447	Sotera Health Co	SHC	NASDAQ Global Select	23.0	46,600,000	$1,071,800,000	2020-1
448	Vision Marine Technologies Inc.	VMAR	NASDAQ Capital	10.0	2,400,000	$24,000,000	2020-1

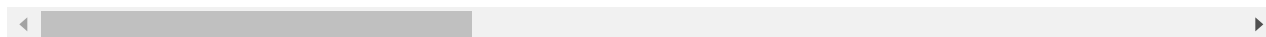|	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_pr
449	Ozon Holdings PLC	OZON	NASDAQ Global Select	30.0	33,000,000	$990,000,000	2020-1

450 rows × 21 columns

In [77]:
```
data_2 = pd.read_csv("./data_collection_part1\part_4_data\companies_years_2009_2020_p4_
data_2
```

Out[77]:

	company_name	ticker	exchange	share_price	shares_offered	dollar_value_of_shares	date_of_pr
0	Zovio Inc	ZVO	New York Stock Exchange	10.5	13,500,000	$141,750,000	2009-0
1	Recon Technology, Ltd	RCON	Nasdaq SmallCap Market	6.0	1,700,000	$10,200,000	2009-0
2	CUMBERLAND PHARMACEUTICALS INC	CPIX	Nasdaq National Market	17.0	5,000,000	$85,000,000	2009-0
3	SELECT MEDICAL HOLDINGS CORP	SEM	New York Stock Exchange	10.0	30,000,000	$300,000,000	2009-0
4	Echo Global Logistics, Inc.	ECHO	Nasdaq National Market	14.0	5,700,000	$79,800,000	2009-1
...	...	...	...	...	...	...	
445	Yatsen Holding Ltd	YSG	NYSE	10.5	58,750,000	$616,875,000	2020-1
446	MARAVAI LIFESCIENCES HOLDINGS, INC.	MRVI	NASDAQ Global Select	27.0	60,000,000	$1,620,000,000	2020-1
447	Sotera Health Co	SHC	NASDAQ Global Select	23.0	46,600,000	$1,071,800,000	2020-1
448	Vision Marine Technologies Inc.	VMAR	NASDAQ Capital	10.0	2,400,000	$24,000,000	2020-1
449	Ozon Holdings PLC	OZON	NASDAQ Global Select	30.0	33,000,000	$990,000,000	2020-1

450 rows × 26 columns

In [ ]: