group-b-1-facebook

May 2, 2024

0.1 Perform the following operations using Python on the Facebook metrics data sets

- Create data subsets
- Merge Data
- Sort Data
- Transposing Data
-

0.2 Shape and reshape Data

0.3 Dataset Description:

Credit: (Moro et al., 2016) S. Moro, P. Rita and B. Vala. Predicting social media performance metrics and evaluation of the impact on brand building: A data mining approach. Journal of Business Research, Elsevier, In press.

Available at: http://dx.doi.org/10.1016/j.jbusres.2016.02.010

1. Title: Facebook performance metrics
2. Sources Created by: Sérgio Moro, Paulo Rita and Bernardo Vala (ISCTE-IUL) @ 2016
3. Past Usage:

   The full dataset was described and analyzed in:

   S. Moro, P. Rita and B. Vala. Predicting social media performance metrics and evaluation of the impact on brand building: A data mining approach. Journal of Business Research, Elsevier, In press, Available online since 28 February 2016.
4. Relevant Information:

   The data is related to posts' published during the year of 2014 on the Facebook's page of a renowned cosmetics brand. This dataset contains 500 of the 790 rows and part of the features analyzed by Moro et al. (2016). The remaining were omitted due to confidentiality issues.
5. Number of Instances: 500
6. Number of Attributes: 19
7. Attribute information:

It includes 7 features known prior to post publication and 12 features for evaluating post impact (see Tables 2 and 3 from Moro et al., 2016 - complete reference in the "Citation Request")

8. Missing Attribute Values: None

[1]:
```
import pandas as pd
```

[2]:
```
df = pd.read_csv('dataset_Facebook.csv',delimiter=';')
```

[3]:
```
df
```

[3]:
```
     Page total likes    Type  Category  Post Month  Post Weekday  Post Hour  \
0              139441   Photo         2          12             4          3
1              139441  Status         2          12             3         10
2              139441   Photo         3          12             3          3
3              139441   Photo         2          12             2         10
4              139441   Photo         2          12             2          3
..                ...     ...       ...         ...           ...        ...
495             85093   Photo         3           1             7          2
496             81370   Photo         2           1             5          8
497             81370   Photo         1           1             5          2
498             81370   Photo         3           1             4         11
499             81370   Photo         2           1             4          4

     Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
0     0.0                       2752                             5091
1     0.0                      10460                            19057
2     0.0                       2413                             4373
3     1.0                      50128                            87991
4     0.0                       7244                            13594
..    ...                        ...                              ...
495   0.0                       4684                             7536
496   0.0                       3480                             6229
497   0.0                       3778                             7216
498   0.0                       4156                             7564
499   NaN                       4188                             7292

     Lifetime Engaged Users  Lifetime Post Consumers  \
0                       178                      109
1                      1457                     1361
2                       177                      113
3                      2211                      790
4                       671                      410
..                      ...                      ...
495                     733                      708
496                     537                      508
497                     625                      572
```

```
498                      626                      574
499                      564                      524

     Lifetime Post Consumptions  \
0                           159
1                          1674
2                           154
3                          1119
4                           580
..                          …
495                         985
496                         687
497                         795
498                         832
499                         743

     Lifetime Post Impressions by people who have liked your Page  \
0                                                 3078
1                                                11710
2                                                 2812
3                                                61027
4                                                 6228
..                                                 …
495                                               4750
496                                               3961
497                                               4742
498                                               4534
499                                               3861

     Lifetime Post reach by people who like your Page  \
0                                                1640
1                                                6112
2                                                1503
3                                               32048
4                                                3200
..                                                …
495                                              2876
496                                              2104
497                                              2388
498                                              2452
499                                              2200

     Lifetime People who have liked your Page and engaged with your post  \
0                                                  119
1                                                 1108
2                                                  132
3                                                 1386
```

```
4                                                   396
..                                                  …
495                                                 392
496                                                 301
497                                                 363
498                                                 370
499                                                 316

     comment    like  share  Total Interactions
0          4    79.0   17.0                 100
1          5   130.0   29.0                 164
2          0    66.0   14.0                  80
3         58  1572.0  147.0                1777
4         19   325.0   49.0                 393
..       …      …     …               …
495        5    53.0   26.0                  84
496        0    53.0   22.0                  75
497        4    93.0   18.0                 115
498        7    91.0   38.0                 136
499        0    91.0   28.0                 119

[500 rows x 19 columns]
```

[4]:
```
df.describe()
```

[4]:
```
       Page total likes    Category  Post Month  Post Weekday   Post Hour  \
count        500.000000  500.000000  500.000000    500.000000  500.000000
mean      123194.176000    1.880000    7.038000      4.150000    7.840000
std        16272.813214    0.852675    3.307936      2.030701    4.368589
min        81370.000000    1.000000    1.000000      1.000000    1.000000
25%       112676.000000    1.000000    4.000000      2.000000    3.000000
50%       129600.000000    2.000000    7.000000      4.000000    9.000000
75%       136393.000000    3.000000   10.000000      6.000000   11.000000
max       139441.000000    3.000000   12.000000      7.000000   23.000000

             Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
count  499.000000                  500.00000                     5.000000e+02
mean     0.278557                13903.36000                     2.958595e+04
std      0.448739                22740.78789                     7.680325e+04
min      0.000000                  238.00000                     5.700000e+02
25%      0.000000                 3315.00000                     5.694750e+03
50%      0.000000                 5281.00000                     9.051000e+03
75%      1.000000                13168.00000                     2.208550e+04
max      1.000000               180480.00000                     1.110282e+06

       Lifetime Engaged Users  Lifetime Post Consumers  \
count              500.000000               500.000000
```

```
mean            920.344000             798.772000
std             985.016636             882.505013
min               9.000000               9.000000
25%             393.750000             332.500000
50%             625.500000             551.500000
75%            1062.000000             955.500000
max           11452.000000           11328.000000

       Lifetime Post Consumptions  \
count                  500.000000
mean                  1415.130000
std                   2000.594118
min                      9.000000
25%                    509.250000
50%                    851.000000
75%                   1463.000000
max                  19779.000000

       Lifetime Post Impressions by people who have liked your Page  \
count                                       5.000000e+02
mean                                        1.676638e+04
std                                         5.979102e+04
min                                         5.670000e+02
25%                                         3.969750e+03
50%                                         6.255500e+03
75%                                         1.486050e+04
max                                         1.107833e+06

       Lifetime Post reach by people who like your Page  \
count                                         500.000000
mean                                         6585.488000
std                                          7682.009405
min                                           236.000000
25%                                          2181.500000
50%                                          3417.000000
75%                                          7989.000000
max                                         51456.000000

       Lifetime People who have liked your Page and engaged with your post  \
count                                         500.000000
mean                                          609.986000
std                                           612.725618
min                                             9.000000
25%                                           291.000000
50%                                           412.000000
75%                                           656.250000
max                                          4376.000000
```

```
          comment          like        share  Total Interactions
count  500.00000   499.000000  496.000000          500.000000
mean     7.48200   177.945892   27.266129          212.120000
std     21.18091   323.398742   42.613292          380.233118
min      0.00000     0.000000    0.000000            0.000000
25%      1.00000    56.500000   10.000000           71.000000
50%      3.00000   101.000000   19.000000          123.500000
75%      7.00000   187.500000   32.250000          228.500000
max    372.00000  5172.000000  790.000000         6334.000000
```

1 Create Data Subsets

[5]:
```
# First subset: Like and Share
df_subset_1 = df[['like','share']]
df_subset_1
```

[5]:
```
       like  share
0      79.0   17.0
1     130.0   29.0
2      66.0   14.0
3    1572.0  147.0
4     325.0   49.0
..      …      …
495    53.0   26.0
496    53.0   22.0
497    93.0   18.0
498    91.0   38.0
499    91.0   28.0

[500 rows x 2 columns]
```

[6]:
```
# second subset: Comment and Type
df_subset_2 = df[['comment','Type']]
df_subset_2
```

[6]:
```
     comment    Type
0          4   Photo
1          5  Status
2          0   Photo
3         58   Photo
4         19   Photo
..       …      …
495        5   Photo
496        0   Photo
497        4   Photo
```

```
498          7    Photo
499          0    Photo

[500 rows x 2 columns]
```

2 Merge Data

[7]:
```python
merged_data  = pd.merge(df_subset_2, df_subset_1, left_on='comment', right_on=
↪'like')
merged_data
```

[7]:
```
      comment    Type  like  share
0           4   Photo   4.0    2.0
1           4   Photo   4.0    1.0
2           4   Photo   4.0    0.0
3           4   Photo   4.0    1.0
4           4  Status   4.0    2.0
…         …       …     …      …
1462       56   Photo  56.0   17.0
1463       56   Photo  56.0    8.0
1464       56   Photo  56.0   12.0
1465       56   Photo  56.0    9.0
1466       56   Photo  56.0   25.0

[1467 rows x 4 columns]
```

2.1 Example for merge

[8]:
```python
# Define a dictionary containing employee data
data1 = {
'key': ['K0', 'K1', 'K2', 'K3'],
'Name':['Jai', 'Princi', 'Gaurav', 'Anuj'],
'Age':[27, 24, 22, 32],}
# Define a dictionary containing employee data
data2 = {
'key': ['K0', 'K1', 'K2', 'K3'],
'Address':['Nagpur', 'Kanpur', 'Allahabad', 'Kannuaj'],
'Qualification':['Btech', 'B.A', 'Bcom', 'B.hons']}
# Convert the dictionary into DataFrame
data1 = pd.DataFrame(data1)
# Convert the dictionary into DataFrame
data2 = pd.DataFrame(data2)

# print(df, "\n\n", df1)
res = pd.merge(data1, data2, on='key')
res
```

[8]:

	key	Name	Age	Address	Qualification
0	K0	Jai	27	Nagpur	Btech
1	K1	Princi	24	Kanpur	B.A
2	K2	Gaurav	22	Allahabad	Bcom
3	K3	Anuj	32	Kannuaj	B.hons

3 Sort Data

[9]:
```python
# Sorting merged_data in descending order wrt 'Like'
merged_data.sort_values(by=['like'],ascending=False)
```

[9]:

	comment	Type	like	share
1461	146	Photo	146.0	15.0
1460	146	Photo	146.0	9.0
1438	144	Photo	144.0	10.0
1439	144	Photo	144.0	29.0
1448	64	Photo	64.0	22.0
…	…	…	…	…
563	0	Photo	0.0	0.0
564	0	Photo	0.0	0.0
565	0	Photo	0.0	0.0
566	0	Photo	0.0	0.0
380	0	Photo	0.0	0.0

[1467 rows x 4 columns]

4 Transposing Data

[10]:
```
# Method 1
merged_data.transpose()
```

[10]:
```
             0      1      2      3       4       5       6       7       8   \
comment      4      4      4      4       4       4       4       4       4
Type     Photo  Photo  Photo  Photo  Status  Status  Status  Status  Status
like       4.0    4.0    4.0    4.0     4.0     4.0     4.0     4.0     4.0
share      2.0    1.0    0.0    1.0     2.0     1.0     0.0     1.0     2.0

             9    …   1457   1458   1459   1460   1461   1462   1463   1464  \
comment       4   …     51     51     51    146    146     56     56     56
Type     Status   …  Photo  Photo  Photo  Photo  Photo  Photo  Photo  Photo
like        4.0   …   51.0   51.0   51.0  146.0  146.0   56.0   56.0   56.0
share       1.0   …   11.0    6.0    6.0    9.0   15.0   17.0    8.0   12.0

          1465   1466
comment     56     56
Type     Photo  Photo
like      56.0   56.0
share      9.0   25.0

[4 rows x 1467 columns]
```

[11]:
```
# Method 2
merged_data.T
```

[11]:
```
             0      1      2      3       4       5       6       7       8   \
comment      4      4      4      4       4       4       4       4       4
Type     Photo  Photo  Photo  Photo  Status  Status  Status  Status  Status
like       4.0    4.0    4.0    4.0     4.0     4.0     4.0     4.0     4.0
share      2.0    1.0    0.0    1.0     2.0     1.0     0.0     1.0     2.0

             9    …   1457   1458   1459   1460   1461   1462   1463   1464  \
comment       4   …     51     51     51    146    146     56     56     56
Type     Status   …  Photo  Photo  Photo  Photo  Photo  Photo  Photo  Photo
like        4.0   …   51.0   51.0   51.0  146.0  146.0   56.0   56.0   56.0
share       1.0   …   11.0    6.0    6.0    9.0   15.0   17.0    8.0   12.0

          1465   1466
comment     56     56
Type     Photo  Photo
like      56.0   56.0
share      9.0   25.0

[4 rows x 1467 columns]
```

5 Shape And Reshape Data

[12]:
```
df
```

[12]:
```
     Page total likes    Type  Category  Post Month  Post Weekday  Post Hour  \
0              139441   Photo         2          12             4          3
1              139441  Status         2          12             3         10
2              139441   Photo         3          12             3          3
3              139441   Photo         2          12             2         10
4              139441   Photo         2          12             2          3
..                ...     ...       ...         ...           ...        ...
495             85093   Photo         3           1             7          2
496             81370   Photo         2           1             5          8
497             81370   Photo         1           1             5          2
498             81370   Photo         3           1             4         11
499             81370   Photo         2           1             4          4

     Paid  Lifetime Post Total Reach  Lifetime Post Total Impressions  \
0     0.0                       2752                             5091
1     0.0                      10460                            19057
2     0.0                       2413                             4373
3     1.0                      50128                            87991
4     0.0                       7244                            13594
..    ...                        ...                              ...
495   0.0                       4684                             7536
496   0.0                       3480                             6229
497   0.0                       3778                             7216
498   0.0                       4156                             7564
499   NaN                       4188                             7292

     Lifetime Engaged Users  Lifetime Post Consumers  \
0                       178                      109
1                      1457                     1361
2                       177                      113
3                      2211                      790
4                       671                      410
..                      ...                      ...
495                     733                      708
496                     537                      508
497                     625                      572
498                     626                      574
499                     564                      524

     Lifetime Post Consumptions  \
0                           159
1                          1674
2                           154
```

```
3                          1119
4                           580
..                           …
495                         985
496                         687
497                         795
498                         832
499                         743

     Lifetime Post Impressions by people who have liked your Page  \
0                                                3078
1                                               11710
2                                                2812
3                                               61027
4                                                6228
..                                                 …
495                                              4750
496                                              3961
497                                              4742
498                                              4534
499                                              3861

     Lifetime Post reach by people who like your Page  \
0                                               1640
1                                               6112
2                                               1503
3                                              32048
4                                               3200
..                                                …
495                                             2876
496                                             2104
497                                             2388
498                                             2452
499                                             2200

     Lifetime People who have liked your Page and engaged with your post  \
0                                                 119
1                                                1108
2                                                 132
3                                                1386
4                                                 396
..                                                 …
495                                               392
496                                               301
497                                               363
498                                               370
499                                               316
```

```
     comment    like  share  Total Interactions
0          4    79.0   17.0                 100
1          5   130.0   29.0                 164
2          0    66.0   14.0                  80
3         58  1572.0  147.0                1777
4         19   325.0   49.0                 393
..       …      …     …                …
495        5    53.0   26.0                  84
496        0    53.0   22.0                  75
497        4    93.0   18.0                 115
498        7    91.0   38.0                 136
499        0    91.0   28.0                 119

[500 rows x 19 columns]
```

[13]:
```python
df.Type.unique()
```

[13]:
```
array(['Photo', 'Status', 'Link', 'Video'], dtype=object)
```

[17]:
```python
# Reshape
# Comment is id_vars and Type is value_vars
pd.melt(df, id_vars =['Type'], value_vars =['comment'])
```

[17]:
```
       Type variable  value
0     Photo  comment      4
1    Status  comment      5
2     Photo  comment      0
3     Photo  comment     58
4     Photo  comment     19
..      …      …    …
495   Photo  comment      5
496   Photo  comment      0
497   Photo  comment      4
498   Photo  comment      7
499   Photo  comment      0

[500 rows x 3 columns]
```

5.1 Examples

[15]:
```python
# Reshape
df_temp = pd.DataFrame({'foo': ['one', 'one', 'one', 'two', 'two', 'two'],
                   'bar': ['A', 'B', 'C', 'A', 'B', 'C'],
                   'baz': [1, 2, 3, 4, 5, 6],
                   'zoo': ['x', 'y', 'z', 'q', 'w', 't']})
df_temp
```

[15]:

	foo	bar	baz	zoo
0	one	A	1	x
1	one	B	2	y
2	one	C	3	z
3	two	A	4	q
4	two	B	5	w
5	two	C	6	t

[16]:

```
df_temp.pivot(index='foo', columns='bar', values='baz')
```

[16]:

bar	A	B	C
foo			
one	1	2	3
two	4	5	6

[ ]:

```
```

[ ]:

```
```