prompt-SRN-06.27.2022.DataProfiling

June 29, 2022

0.0.1 (Profile of the Coupon Dataset using Pandas_Profiling Library)

```
In [1]: import matplotlib.pyplot as plt
        import seaborn as sns
        import pandas as pd
        import numpy as np
        import pandas_profiling
        from  pandas_profiling import ProfileReport
```

```
In [2]: # importing the sys module
        import sys

        # the setrecursionlimit function is
        # to modify the default recursion limit set by python. Using this,
        # Increased to make notebook load properly
        sys.setrecursionlimit(10**6)
```

0.0.2 Problems

Use the prompts below to get started with your data analysis.

1. Read in the `coupons.csv` file.

```
In [3]: data = pd.read_csv('data/coupons.csv')
```

```
In [4]: data.head()
```

```
Out[4]:        destination  passanger weather  temperature  time  \
        0  No Urgent Place      Alone   Sunny           55   2PM
        1  No Urgent Place  Friend(s)   Sunny           80  10AM
        2  No Urgent Place  Friend(s)   Sunny           80  10AM
        3  No Urgent Place  Friend(s)   Sunny           80   2PM
        4  No Urgent Place  Friend(s)   Sunny           80   2PM

                          coupon expiration  gender age      maritalStatus  ...  \
        0        Restaurant(<20)         1d  Female  21  Unmarried partner  ...
        1           Coffee House         2h  Female  21  Unmarried partner  ...
        2  Carry out & Take away         2h  Female  21  Unmarried partner  ...
```

```
3           Coffee House         2h  Female  21  Unmarried partner  ...
4           Coffee House         1d  Female  21  Unmarried partner  ...

   CoffeeHouse CarryAway RestaurantLessThan20 Restaurant20To50  \
0        never       NaN                 4~8              1~3
1        never       NaN                 4~8              1~3
2        never       NaN                 4~8              1~3
3        never       NaN                 4~8              1~3
4        never       NaN                 4~8              1~3

  toCoupon_GEQ5min toCoupon_GEQ15min toCoupon_GEQ25min direction_same  \
0                1                 0                 0              0
1                1                 0                 0              0
2                1                 1                 0              0
3                1                 1                 0              0
4                1                 1                 0              0

  direction_opp  Y
0             1  1
1             1  0
2             1  1
3             1  0
4             1  0

[5 rows x 26 columns]
```

2. Investigate the dataset for missing or problematic data.

```
In [5]: #dimensions of the datframe

        data.shape

Out[5]: (12684, 26)

In [6]: #start with some libraries needed
        import plotly.express as px

In [7]: #Check the series data for unique values

        for col in data.columns:
            print('')
            print("{} column has {} unique values".format(col,data[col].nunique()))


destination column has 3 unique values

passanger column has 4 unique values

weather column has 3 unique values
```

```
temperature column has 3 unique values

time column has 5 unique values

coupon column has 5 unique values

expiration column has 2 unique values

gender column has 2 unique values

age column has 8 unique values

maritalStatus column has 5 unique values

has_children column has 2 unique values

education column has 6 unique values

occupation column has 25 unique values

income column has 9 unique values

car column has 5 unique values

Bar column has 5 unique values

CoffeeHouse column has 5 unique values

CarryAway column has 5 unique values

RestaurantLessThan20 column has 5 unique values

Restaurant20To50 column has 5 unique values

toCoupon_GEQ5min column has 1 unique values

toCoupon_GEQ15min column has 2 unique values

toCoupon_GEQ25min column has 2 unique values

direction_same column has 2 unique values

direction_opp column has 2 unique values

Y column has 2 unique values
```

```
In [8]: data['Y'].unique()
```

```
Out[8]: array([1, 0], dtype=int64)
```

```
In [9]: analyze=data.rename(columns={"Y":"coupon_redeem_status"})
        analyze.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 12684 entries, 0 to 12683
Data columns (total 26 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   destination           12684 non-null  object
 1   passanger             12684 non-null  object
 2   weather               12684 non-null  object
 3   temperature           12684 non-null  int64
 4   time                  12684 non-null  object
 5   coupon                12684 non-null  object
 6   expiration            12684 non-null  object
 7   gender                12684 non-null  object
 8   age                   12684 non-null  object
 9   maritalStatus         12684 non-null  object
 10  has_children          12684 non-null  int64
 11  education             12684 non-null  object
 12  occupation            12684 non-null  object
 13  income                12684 non-null  object
 14  car                   108 non-null    object
 15  Bar                   12577 non-null  object
 16  CoffeeHouse           12467 non-null  object
 17  CarryAway             12533 non-null  object
 18  RestaurantLessThan20  12554 non-null  object
 19  Restaurant20To50      12495 non-null  object
 20  toCoupon_GEQ5min      12684 non-null  int64
 21  toCoupon_GEQ15min     12684 non-null  int64
 22  toCoupon_GEQ25min     12684 non-null  int64
 23  direction_same        12684 non-null  int64
 24  direction_opp         12684 non-null  int64
 25  coupon_redeem_status  12684 non-null  int64
dtypes: int64(8), object(18)
memory usage: 2.5+ MB
```

```
In [10]: #Examine the  numerical data in the data frame

         numerical_values = data.select_dtypes(include = ['int64'])

         numerical_values.head(3).T
```

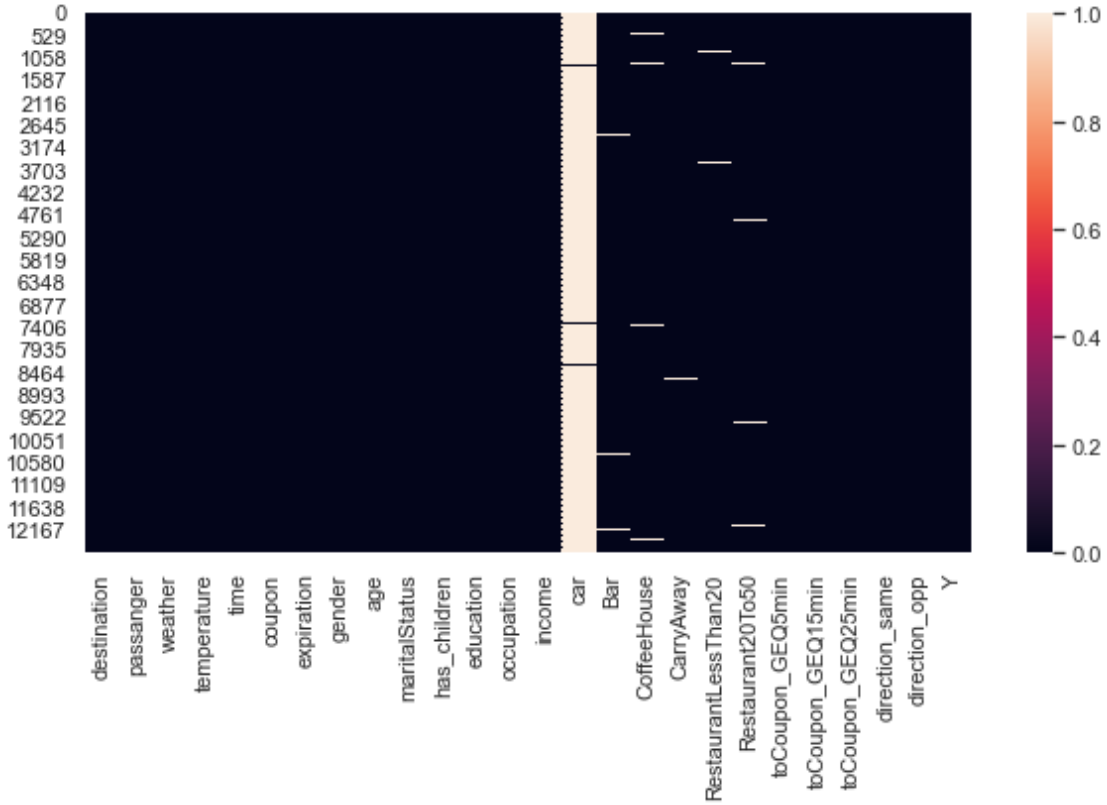
```
Out[10]:                    0   1   2
         temperature       55  80  80
```

```
has_children          1    1    1
toCoupon_GEQ5min      1    1    1
toCoupon_GEQ15min     0    0    1
toCoupon_GEQ25min     0    0    0
direction_same        0    0    0
direction_opp         1    1    1
Y                     1    0    1
```

In [11]:
```
#Check for columns with missing data

missing_columns = data.columns[data.isnull().any()].values
total_missing_columns = np.count_nonzero(data.isnull().sum())
print('Number of Columns with missing values: ', total_missing_columns, ' names of fea

#Visually inspect to verify whether there is missing data using a heatmap


sns.set(rc = {'figure.figsize':(10,5)})
sns.heatmap(data.isnull())
```

```
Number of Columns with missing values:  6  names of features:  ['car' 'Bar' 'CoffeeHouse' 'Carr
 'Restaurant20To50']
```

Out[11]: <AxesSubplot:>



3. Decide what to do about your missing data -- drop, replace, other...

There are some missing values in several columns as can be seen from 11. 'car' column has 108 non-null values, which means more than 99% of the values are marked as "NaN". So this column can be dropped. The data given is insufficient for any kind of analysis, so it is best to remove this column.

```
In [12]: #Counts of unique values in the Car series

         print(analyze["car"].value_counts())

         #dropping the car series from the dataframe
         analyze.drop('car', inplace=True, axis=1)

         analyze.info()
```

```
Mazda5                                      22
Scooter and motorcycle                      22
do not drive                                22
crossover                                   21
Car that is too old to install Onstar :D    21
Name: car, dtype: int64
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 12684 entries, 0 to 12683
Data columns (total 25 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   destination           12684 non-null  object
 1   passanger             12684 non-null  object
 2   weather               12684 non-null  object
 3   temperature           12684 non-null  int64
 4   time                  12684 non-null  object
 5   coupon                12684 non-null  object
 6   expiration            12684 non-null  object
 7   gender                12684 non-null  object
 8   age                   12684 non-null  object
 9   maritalStatus         12684 non-null  object
 10  has_children          12684 non-null  int64
 11  education             12684 non-null  object
 12  occupation            12684 non-null  object
 13  income                12684 non-null  object
 14  Bar                   12577 non-null  object
 15  CoffeeHouse           12467 non-null  object
 16  CarryAway             12533 non-null  object
 17  RestaurantLessThan20  12554 non-null  object
```

```
 18  Restaurant20To50      12495 non-null  object
 19  toCoupon_GEQ5min      12684 non-null  int64
 20  toCoupon_GEQ15min     12684 non-null  int64
 21  toCoupon_GEQ25min     12684 non-null  int64
 22  direction_same        12684 non-null  int64
 23  direction_opp         12684 non-null  int64
 24  coupon_redeem_status  12684 non-null  int64
dtypes: int64(8), object(17)
memory usage: 2.4+ MB
```

```
In [13]: profile = ProfileReport(analyze, title="Coupon Usage Dataset Profiling Report")
```

```
         profile
```

```
Summarize dataset:   0%|          | 0/5 [00:00<?, ?it/s]
```

```
Generate report structure:   0%|          | 0/1 [00:00<?, ?it/s]
```

```
Render HTML:   0%|          | 0/1 [00:00<?, ?it/s]
```

```
<IPython.core.display.HTML object>
```

```
Out[13]:
```

```
In [14]: profile.to_file("Module5_DataProfilingReport.ShajiR.Nathan.html")
```

```
Export report to file:   0%|          | 0/1 [00:00<?, ?it/s]
```