Scoping_items_Function

October 6, 2024

0.0.1 Data Scopring function for Items with Irregular Patterns

0.0.2 Importing packages

[92]:
```
import pandas as pd
import sys
import matplotlib.pyplot as plt
import altair as alt
import vegafusion as vf
import sklearn
import vega_datasets
from sklearn.pipeline import Pipeline, make_pipeline
import seaborn as sns
from matplotlib.patches import Patch
```

0.0.3 Functions related to importing and data preparations

[93]:
```
def f_concat(l_input):

    # Initialize.
    dummy = ""
    n_len = len(l_input)

    if n_len == 1:
        return l_input[0]

    # Loop through text elements.
    for i in range(n_len - 1):
        dummy = dummy + l_input[i] + ", "

    # Append last element.
    dummy = dummy + "and " + l_input[n_len - 1]

    # Return result.
    return dummy
```

[94]:
```
def f_describe(df_input, n_top=10):
```

```
    print("First " + str(n_top) + " rows in de data:")
    display(df_input.head(n_top))

    df_numeric = df_input.select_dtypes(
        include=[
            "uint8",
            "uint16",
            "uint32",
            "uint64",
            "int8",
            "int16",
            "int32",
            "int64",
            "float16",
            "float32",
            "float64",
        ]
    )

    if len(df_numeric.columns):
        print("Numerical data:")
        display(df_numeric.describe())

    df_textual = df_input.select_dtypes(include=["category", "object", "bool"])

    if len(df_textual.columns):
        print("Textual data:")
        display(df_textual.describe())

    v_na = [
        col
        + " ("
        + str(df[col].isna().sum())
        + ", "
        + str(round(100 * df[col].isna().sum() / df.shape[0], 1))
        + "%)"
        for col in df.columns
        if df[col].isna().sum() > 0
    ]

    if len(v_na) > 0:
        print("Features and their number of missing values:")
        display(f_concat(v_na))
```

[95]:
```
def f_get_data(i=0):

    # Define path.
```

```
    c_path = "/Users/Georgi/Documents/EAISI/EASI_4B_Supermarket/Group4B/data/
↪raw/"
    # Identify file.
    v_file = (
        "history-per-year",  # 0
        "history_aggregated",  # 1
        "holidays_events",  # 2
        "items",  # 3
        "oil",  # 4
        "stores",  # 5
        "transactions",
    )  # 6

    # Load data.
    df = (
        pd.read_parquet(c_path + v_file[i] + ".parquet")
        .rename(columns=standardize_column_names)
        .pipe(optimize_memory)
        .pipe(month_year_to_int, i)
        .pipe(transform_date_to_datetime, i)
    )

    # Return data.
    return df
```

0.0.4 Importing data: Here I import the sales and items data.

[96]:
```
df_sales= f_get_data(0)
df_items =f_get_data(3)
```

```
Change: integer --> unsigned
Change: float --> float
Change: Month and Year to integer
Change: Transformed 'year', 'month', 'day' columns to Datetime feature
Change: integer --> unsigned
Change: float --> float
```

3.1.4. Function List - Returns a list of all items the belong to families with demand pattern of poor data quality: 'BEVERAGES', 'PRODUCE', 'CELEBRATION', 'HOME AND KITCHEN I', 'HOME AND KITCHEN II','HOME CARE','LADIESWARE','PETS SUPPLIES','PLAYERS AND ELECTRONICS','SCHOOL AND OFFICE SUPPLIES'

[105]:
```
def items_exclude_family(df_items, families=['BEVERAGES', 'PRODUCE',␣
↪'CELEBRATION', 'HOME AND KITCHEN I', 'HOME AND KITCHEN II','HOME␣
↪CARE','LADIESWARE','PETS SUPPLIES','PLAYERS AND ELECTRONICS','SCHOOL AND␣
↪OFFICE SUPPLIES']):
```

```
    list_items_in_families = df_items[df_items["family"].
 ↪isin(families)]["item_nbr"].tolist()

    return list_items_in_families
```

3.1.5. Function Drop Items on List - Excludes items sales data with from the list "list_items_in_families"

[98]:
```
def df_sales_cleaned_items(df_sales, list_items_in_families):


    df_sales_cleaned = df_sales[~df_sales["item_nbr"].
 ↪isin(list_items_in_families)]

    return df_sales_cleaned
```

3.1.5A Call the function df_sales_cleaned_items and items_esxcluse_items to reduce the dataset

[99]:
```
list_items_to_exclude = items_exclude_family(df_items)
cleaned_df_sales = df_sales_cleaned_items(df_sales, list_items_to_exclude)
```

Check the results: before and after

[100]:
```
# Get the length of df_sales before and after cleaning
total_observations_len_prior = len(df_sales)
total_observations_len_post = len(cleaned_df_sales)
rows_removed = total_observations_len_prior - total_observations_len_post

# Print the results in a single line with formatted output
print(f"Total observations before cleaning: {total_observations_len_prior},␣
 ↪after cleaning: {total_observations_len_post}, rows removed: {rows_removed}")
```

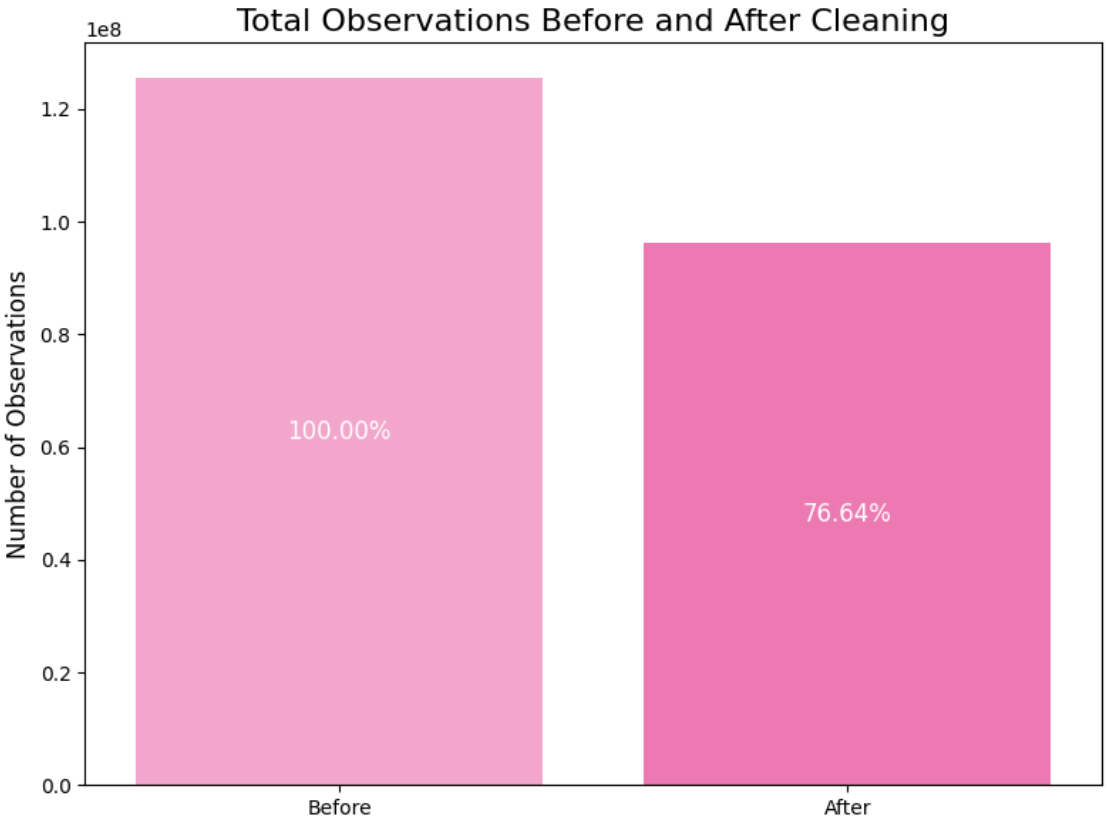
```
Total observations before cleaning: 125497040, after cleaning: 96180971, rows
removed: 29316069
```

Visualize the changes

[104]:
```
#Source: ChatGPT
# Step 1: Calculate the total number of observations
total_observations_len_prior = len(df_sales)
total_observations_len_post = len(cleaned_df_sales)
rows_removed = total_observations_len_prior - total_observations_len_post

# Step 2: Calculate percentages
percent_remaining = (total_observations_len_post /␣
 ↪total_observations_len_prior) * 100
percent_removed = (rows_removed / total_observations_len_prior) * 100

# Step 3: Prepare data for visualization
```

```
data = {
    'Group': ['Before', 'After'],
    'Observations': [total_observations_len_prior, total_observations_len_post],
    'Percentage': [100, percent_remaining]
}

# Step 4: Create a bar plot with a "girly" color palette (pinks and purples)
plt.figure(figsize=(8, 6))
bars = sns.barplot(x='Group', y='Observations', data=data, palette=['#ff99cc',␣
 ↪'#ff66b2'])  # Soft pink shades

# Step 5: Add the percentages inside the bars
for i, percentage in enumerate(data['Percentage']):
    bars.text(i, data['Observations'][i] / 2,  # Positioning in the middle of␣
 ↪the bar
              f'{percentage:.2f}%', ha='center', va='center', fontsize=12,␣
 ↪color='white')

# Step 6: Customize the plot
plt.title('Total Observations Before and After Cleaning', fontsize=16)
plt.ylabel('Number of Observations', fontsize=12)

# Show the plot
plt.tight_layout()
plt.show()
```

```
/Users/Georgi/Documents/Group4B/venv_case_project/lib/python3.10/site-
packages/seaborn/_oldcore.py:1765: FutureWarning: unique with argument that is
not not a Series, Index, ExtensionArray, or np.ndarray is deprecated and will
raise in a future version.
  order = pd.unique(vector)
```


Total Observations Before and After Cleaning
1e8
Number of Observations
1.2
1.0
0.8
0.6
0.4
0.2
0.0
100.00%
76.64%
Before
After