Importing libraries

In [1]:

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
# for the Q-Q plots
#import scipy.stats as stats
%matplotlib inline
import pandas as pd
pd.options.display.float_format = '{:.2f}'.format
#from pandas.io.json import json_normalize
```

Importing dataset for brands

In [2]:

```
brands = pd.read_excel("brands.xlsx")
```

In [3]:

```
brands.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1167 entries, 0 to 1166
Data columns (total 9 columns):
_id/$oid        1167 non-null object
barcode         1167 non-null int64
category        1012 non-null object
categoryCode    517 non-null object
cpg/$id/$oid    1167 non-null object
cpg/$ref        1167 non-null object
name            1167 non-null object
topBrand        555 non-null object
brandCode       898 non-null object
dtypes: int64(1), object(8)
memory usage: 82.2+ KB
```

In [4]:

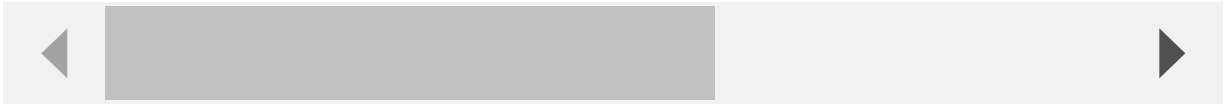
```
brands["barcode"] = brands["barcode"].astype(str)
```

In [5]:

```
brands.head()
```

Out[5]:

	_id/$oid	barcode	category	categoryCode	cpg
0	601ac115be37ce2ead437551	511111019862	Baking	BAKING	601ac114be37ce2e
1	601c5460be37ce2ead43755f	511111519928	Beverages	BEVERAGES	5332f5fbe4b03c9a
2	601ac142be37ce2ead43755d	511111819905	Baking	BAKING	601ac142be37ce2e
3	601ac142be37ce2ead43755a	511111519874	Baking	BAKING	601ac142be37ce2e
4	601ac142be37ce2ead43755e	511111319917	Candy & Sweets	CANDY_AND_SWEETS	5332fa12e4b03c9a



Quantifying missing data

In [6]:

```
brands.isnull().sum()
```

Out[6]:

```
_id/$oid          0
barcode           0
category        155
categoryCode    650
cpg/$id/$oid      0
cpg/$ref          0
name              0
topBrand        612
brandCode       269
dtype: int64
```

percentage of missing values in variables

In [7]:

```
# alternatively, we can use the mean() method after isnull() to visualise the percentage o
f missing values for each variable
percentage_null_values = brands.isnull().mean()
for key,value in percentage_null_values.items():
    if value >0:
        print(key,":",value*100)
```

```
category : 13.281919451585262
categoryCode : 55.69837189374465
topBrand : 52.44215938303341
brandCode : 23.050556983718938
```

A considerate fraction of values(more than 50%) are missing from topBrand and categoryCode variables.

Checking for redundant records

In [8]:

```
duplicateRowsDF = brands[brands.duplicated()]
print("Duplicate Rows except first occurrence based on all columns are :")
print(duplicateRowsDF)
```

```
Duplicate Rows except first occurrence based on all columns are :
Empty DataFrame
Columns: [_id/$oid, barcode, category, categoryCode, cpg/$id/$oid, cpg/$ref,
name, topBrand, brandCode]
Index: []
```

No duplicate records found.

Examining values of categorical varibales

Here, the variable of my interest is brand 'category'.

In [10]:

```
brands["category"].unique()
```

Out[10]:

```
array(['Baking', 'Beverages', 'Candy & Sweets', 'Condiments & Sauces',
       'Canned Goods & Soups', nan, 'Magazines', 'Breakfast & Cereal',
       'Beer Wine Spirits', 'Health & Wellness', 'Beauty', 'Baby',
       'Frozen', 'Grocery', 'Snacks', 'Household', 'Personal Care',
       'Dairy', 'Cleaning & Home Improvement', 'Deli',
       'Beauty & Personal Care', 'Bread & Bakery', 'Outdoor',
       'Dairy & Refrigerated'], dtype=object)
```

Examining percentage of different category values for categorical variables

Here, the categorical variable of my interest is category,

In [11]:

```
freq_category = 100*(brands['category'].value_counts() / len(brands))
print(freq_category.map('{:,.2f} %'.format))
```

```
Baking                          31.62 %
Beer Wine Spirits                7.71 %
Snacks                           6.43 %
Candy & Sweets                   6.08 %
Beverages                        5.40 %
Health & Wellness                3.77 %
Magazines                        3.77 %
Breakfast & Cereal               3.43 %
Grocery                          3.34 %
Dairy                            2.83 %
Condiments & Sauces              2.31 %
Frozen                           2.06 %
Personal Care                    1.71 %
Baby                             1.54 %
Canned Goods & Soups             1.03 %
Beauty                           0.77 %
Cleaning & Home Improvement      0.51 %
Deli                             0.51 %
Beauty & Personal Care           0.51 %
Bread & Bakery                   0.43 %
Dairy & Refrigerated             0.43 %
Household                        0.43 %
Outdoor                          0.09 %
Name: category, dtype: object
```

Majority of brands belong to the 'Baking' category

No data quality issues found except large number of missing values in topBrand and categoryCode columns.