Get the data

In [ ]:
```
!gdown --id 1HVSazFk8m553VWPjFnZZ-YfJA_KecPea
!unzip translated_data_updated.zip
```

```
Downloading...
From: https://drive.google.com/uc?id=1HVSazFk8m553VWPjFnZZ-YfJA_KecPea
To: /content/translated_data_updated.zip
100% 122M/122M [00:01<00:00, 78.6MB/s]
Archive:  translated_data_updated.zip
   creating: data_translated/
  inflating: data_translated/coupon_visit_train.csv
  inflating: data_translated/coupon_list_train.csv
  inflating: data_translated/prefecture_locations.csv
  inflating: data_translated/coupon_area_test.csv
  inflating: data_translated/coupon_detail_train.csv
  inflating: data_translated/coupon_area_train.csv
  inflating: data_translated/user_list.csv
  inflating: data_translated/coupon_list_test.csv
```

In [ ]:
```
# imports
import pandas as pd
import seaborn as sns
import numpy as np
import matplotlib.pyplot as plt

sns.set_theme(context='notebook', style='darkgrid')
```

In [ ]:
```
# Important Note:
# Visits = browsing history in the training period. No test set available.
# Purchases = purchase history in the training period. No test set available.

df_users        = pd.read_csv('data_translated/user_list.csv')
df_c_list_train = pd.read_csv('data_translated/coupon_list_train.csv')
df_c_list_test  = pd.read_csv('data_translated/coupon_list_test.csv')
df_area_train   = pd.read_csv('data_translated/coupon_area_train.csv')
df_area_test    = pd.read_csv('data_translated/coupon_area_test.csv')
df_visit_train  = pd.read_csv('data_translated/coupon_visit_train.csv')
df_purch_train  = pd.read_csv('data_translated/coupon_detail_train.csv')
df_locations    = pd.read_csv('data_translated/prefecture_locations.csv')
```

Feature Engineering

User List

In [ ]:
```
# rename SEX_ID column, change to categorical value (0 Male, 1 Female)
df_users['SEX'] = df_users['SEX_ID'].replace('f', 1)
df_users['SEX'] = df_users['SEX'].replace('m', 0)
```

In [ ]:
```
# create a categorical variable for age group:
# 14-21, 22-35, 36-49, 50-65, 66-75, 76-90
def age_cat(age):
```

```
  if age <= 21:
    return 0
  elif age <= 35:
    return 1
  elif age <= 49:
    return 2
  elif age <= 65:
    return 3
  elif age <= 75:
    return 4
  elif age <= 90:
    return 5
  else:
    return 6

lbl_age_ranges = ['14-21', '22-35', '36-49', '50-65', '66-75', '76-90']

df_users['AGE_GROUP'] = [age_cat(a) for a in df_users['AGE']]
```

In [ ]:
```
df_users.head()
```

Out[ ]:

	Unnamed: 0	REG_DATE	SEX_ID	AGE	WITHDRAW_DATE	USER_ID_hash	I
0	0	2012-03-28 14:14:18	f	25	NaN	d9dca3cb44bab12ba313eaa681f663eb	
1	1	2011-05-18 00:41:48	f	34	NaN	560574a339f1b25e57b0221e486907ed	
2	2	2011-06-13 16:36:58	m	41	NaN	e66ae91b978b3229f8fd858c80615b73	
3	3	2012-02-08 12:56:15	m	25	NaN	43fc18f32eafb05713ec02935e2c2825	
4	4	2011-05-22 23:43:56	m	62	NaN	dc6df8aa860f8db0d710ce9d4839840f	

In [ ]:
```
df_purch_train.head(5)
```

Out[ ]:

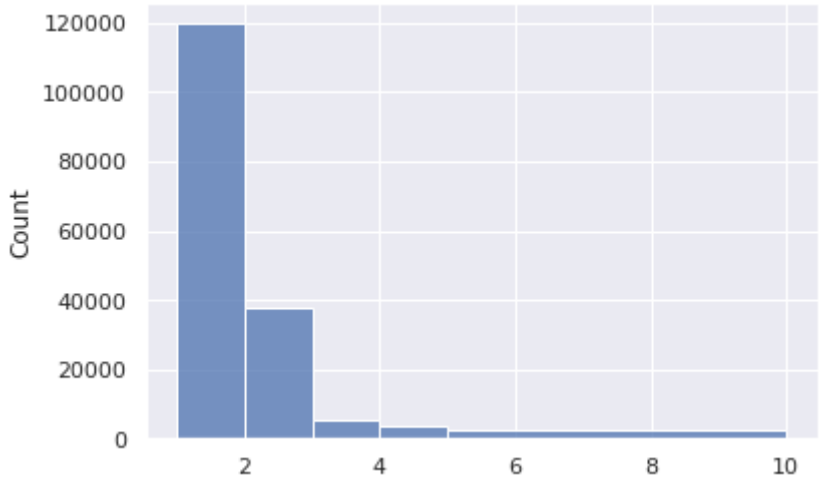
	Unnamed: 0	ITEM_COUNT	I_DATE	PURCHASEID_hash	
0	0	1	2012-03-28 15:06:06	c820a8882374a4e472f0984a8825893f	d9dca3cb44bab12ba3
1	1	1	2011-07-04 23:52:54	1b4eb2435421ede98c8931c42e8220ec	560574a339f1b25e57b
2	2	1	2011-07-16 00:52:49	36b5f9ba46c44b65587d0b16f2e4c77f	560574a339f1b25e57b

	Unnamed: 0	ITEM_COUNT	I_DATE	PURCHASEID_hash	
3	3	1	2011-07-16 00:54:53	2f30f46937cc9004774e576914b2aa1a	560574a339f1b25e57b
4	4	1	2011-07-16 00:55:52	4d000c64a55ac573d0ae1a8f03677f50	560574a339f1b25e57b

In [ ]:
```
p = df_purch_train.drop(columns=['Unnamed: 0', 'I_DATE', 'PURCHASEID_hash', 'COU
p = p.sort_values(by=['ITEM_COUNT'], ascending=False)

l = p['ITEM_COUNT'].to_numpy()
sns.histplot(l, bins=[1,2,3,4,5,10])
```

Out[ ]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7ff83c77c650>
```



In [ ]:
```
# create random baseline
# this code is unrelated to the EDA, just useful to have
user_list = df_users['USER_ID_hash']

rows = []
for u in user_list:
  coupon_list = df_c_list_test.sample(n=10, replace=False)['COUPON_ID_hash']
  coupon_list_str = ' '.join(coupon_list)

  row = {'USER_ID_hash': u, 'PURCHASED_COUPONS': coupon_list_str}
  rows.append(row)

df_pred = pd.DataFrame.from_dict(rows)
df_pred.to_csv('sample_submission.csv', header=True, index=False)
```

In [ ]:
```
user_list.head()
```

Out[ ]:
```
0    d9dca3cb44bab12ba313eaa681f663eb
1    560574a339f1b25e57b0221e486907ed
2    e66ae91b978b3229f8fd858c80615b73
3    43fc18f32eafb05713ec02935e2c2825
```

```
4    dc6df8aa860f8db0d710ce9d4839840f
Name: USER_ID_hash, dtype: object
```

In [ ]:
```
# let's call this user 'Yuna': 560574a339f1b25e57b0221e486907ed
# Registered a month before the training data period started
# Lives in Tokyo, so probably lots of local coupons
# She bought 16 coupons during the training period
# Female - age 34
yuna = df_users[df_users['USER_ID_hash'] == '560574a339f1b25e57b0221e486907ed']
yuna
```

Out[ ]:

	Unnamed: 0	REG_DATE	SEX_ID	AGE	WITHDRAW_DATE	USER_ID_hash	P
1	1	2011-05-18 00:41:48	f	34	NaN	560574a339f1b25e57b0221e486907ed	

In [ ]:
```
# Coupons Yuna has bought
c_yuna = df_purch_train[df_purch_train['USER_ID_hash'] == '560574a339f1b25e57b02
len(c_yuna)
```

Out[ ]:
```
16
```

In [ ]:
```
# More details about Yuna's purchases
c_yuna.head()
```

Out[ ]:

	Unnamed: 0	ITEM_COUNT	I_DATE	PURCHASEID_hash	
1	1	1	2011-07-04 23:52:54	1b4eb2435421ede98c8931c42e8220ec	560574a339f1b25e57b
2	2	1	2011-07-16 00:52:49	36b5f9ba46c44b65587d0b16f2e4c77f	560574a339f1b25e57b
3	3	1	2011-07-16 00:54:53	2f30f46937cc9004774e576914b2aa1a	560574a339f1b25e57b
4	4	1	2011-07-16 00:55:52	4d000c64a55ac573d0ae1a8f03677f50	560574a339f1b25e57b
5	5	1	2011-07-16 00:57:09	d8b030c8a4a2c1051997092a2985b373	560574a339f1b25e57b

In [ ]:
```
# OK, we need more info from the coupon list, so let's join them.
df_purch_details = df_c_list_train.set_index('COUPON_ID_hash').join(df_purch_tra
c_yuna_details = df_purch_details[df_purch_details['USER_ID_hash'] == '560574a33
print(len(c_yuna_details))
c_yuna_details.head(5)
```

```
16
```

Out[ ]:

COUPON_ID_hash	Unnamed: 0_caller	PRICE_RATE	CATALOG_PRICE	DISCOUNT_PRIC
129a696dac8e7eb0903f02ae217c636e	15551	50	750	37
259a22533cab381464c89f616a56d12d	3770	71	6237	180
34ea3cc1cf4ec57f3547c5fcd4de3abe	14122	50	3120	155
3e7d148d632f7ee123504e37d3ee9c66	10370	62	12000	450
4257a8a169b40bbbcb002ec47ab3de13	8477	55	4470	198

In [1]:

```
genres = c_yuna_details.groupby('GENRE_NAME_EN').size()
g = genres.to_frame().reset_index()
g.columns = ['Genre', 'Count']

fig, ax = plt.subplots(figsize=(10, 6))
sns.barplot(ax=ax, x=g['Genre'], y=g['Count'])
plt.yticks(range(1,10))
plt.title("Coupons purchased by 'Yuna' (16 total)")
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-1-2d34c2a72862> in <module>()
----> 1 genres = c_yuna_details.groupby('GENRE_NAME_EN').size()
      2 g = genres.to_frame().reset_index()
      3 g.columns = ['Genre', 'Count']
      4
      5 fig, ax = plt.subplots(figsize=(10, 6))

NameError: name 'c_yuna_details' is not defined
```

In [ ]: