Ezinne Okechukwu || Data Analyst || adahacos@gmail.com

Quantium Job Simulation || Task 3 Visualization (PPT REPORT)

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

In [ ]:
```
# load data
df = pd.read_csv('QVI_data.csv')
df.head()
```

Out[ ]:

	LYLTY_CARD_NBR	DATE	STORE_NBR	TXN_ID	PROD_NBR	PROD_NAME	PROD_QTY	TOT_SALES	PACK_SIZE	BRAND	LIFESTAGE	PREMIUM
0	1000	2018-10-17	1	1	5	Natural Chip Compny SeaSalt175g	2	6.0	175	NATURAL	YOUNG SINGLES/COUPLES	
1	1002	2018-09-16	1	2	58	Red Rock Deli Chikn&Garlic Aioli 150g	1	2.7	150	RRD	YOUNG SINGLES/COUPLES	
2	1003	2019-03-07	1	3	52	Grain Waves Sour Cream&Chives 210G	1	3.6	210	GRNWVES	YOUNG FAMILIES	
3	1003	2019-03-08	1	4	106	Natural ChipCo Hony Soy Chckn175g	1	3.0	175	NATURAL	YOUNG FAMILIES	
4	1004	2018-11-02	1	5	96	WW Original Stacked Chips 160g	1	1.9	160	WOOLWORTHS	OLDER SINGLES/COUPLES	

In [ ]:
```
#view columns
df.columns
```

Out[ ]:
```
Index(['LYLTY_CARD_NBR', 'DATE', 'STORE_NBR', 'TXN_ID', 'PROD_NBR',
       'PROD_NAME', 'PROD_QTY', 'TOT_SALES', 'PACK_SIZE', 'BRAND', 'LIFESTAGE',
       'PREMIUM_CUSTOMER'],
      dtype='object')
```

In [ ]:
```
# rename the premium_customer column to affluence
df['Affluence Level'] = df['PREMIUM_CUSTOMER']
# convert lifestage strings to title case
df['LIFESTAGE'] = df['LIFESTAGE'].str.title()
# convert brand column to title case
df['BRAND'] = df['BRAND'].str.title()
```

In [ ]:
```
# group brand by customer affluence
brand_affluence = df.groupby(['BRAND', 'Affluence Level'])['TOT_SALES'].sum().unstack()
# sorting stacked table by sum of the brand rows
brand_affluence.head()
```

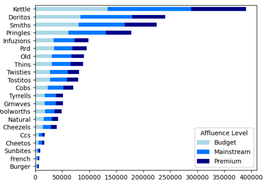
Out[ ]:

Affluence Level	Budget	Mainstream	Premium
BRAND			
Burger	2527.7	2392.0	1911.3
Ccs	6657.0	6507.9	4914.0
Cheetos	6071.6	6374.1	4438.8
Cheezels	13983.9	15303.3	10742.7
Cobs	23780.4	28363.2	18426.2

In [ ]:
```
#sort brand_affluence
brand_affluence = brand_affluence.loc[brand_affluence.sum(axis=1).sort_values(ascending= True).index]

# visualize the resulting table
brand_affluence.plot(kind = 'barh', stacked = True, color = ['#ADDBE6', '#007BFF', '#0000BB'])
plt.ylabel('')
```

Out[ ]:
```
Text(0, 0.5, '')
```



In [ ]:
```
# group df by lifestage and affluence level
lifestage_premium = df.groupby(['LIFESTAGE', 'Affluence Level'])['TOT_SALES'].sum().unstack()
lifestage_premium.sort_values(by = 'Budget', ascending= False)
lifestage_premium
```

Out[ ]:

Affluence Level	Budget	Mainstream	Premium
LIFESTAGE			
Midage Singles/Couples	35514.80	90803.85	58432.65
New Families	21928.45	17013.90	11491.10
Older Families	168363.25	103445.55	80658.40
Older Singles/Couples	136769.80	133393.80	132263.15
Retirees	113147.80	155677.05	97646.05
Young Families	139345.85	92788.75	84025.50
Young Singles/Couples	61141.60	157621.60	41642.10

In [ ]:
```
# sorting stacked table by sum of the lifestage rows
lifestage_premium = lifestage_premium.loc[lifestage_premium.sum(axis=1).sort_values(ascending= True).index]
lifestage_premium
```

Out[ ]:

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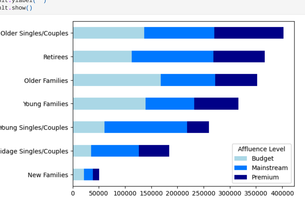
In [ ]:
```
#visualize total sales by lifestage and premium group
lifestage_premium.plot(kind = 'barh', stacked = True, color = ['#ADDBE6', '#007BFF', '#0000BB'])
plt.xlabel('')
plt.ylabel('')
plt.show()
```



In [ ]:
```
df['DATE'] = pd.to_datetime(df['DATE'])
# create a month column
df['MONTH'] = df['DATE'].dt.to_period('M')

start_date = '02-01-2019' #MM-DD-YYYY format
end_date = '05-31-2019'
```

In [ ]:
```
# create a new column grouping the stores into 'trial store', 'control store' and 'other stores'
df['STORE_TYPE'] = 'Other Stores'
df.loc[df['STORE_NBR'].isin([71, 155, 134]), 'STORE_TYPE'] = 'Control Stores'
df.loc[df['STORE_NBR'].isin([77, 86, 88]), 'STORE_TYPE'] = 'Trial Stores'
df['STORE_TYPE'].unique()
```

Out[ ]:
```
array(['Other Stores', 'Control Stores', 'Trial Stores'], dtype=object)
```

In [ ]:
```
data = df.groupby(['STORE_TYPE', 'MONTH']).agg({
    'TOT_SALES': 'sum',
    'LYLTY_CARD_NBR': 'nunique',
    'STORE_NBR': 'nunique'
}).rename(columns={'STORE_NBR': 'STORE_COUNT', 'TOT_SALES': 'AMOUNT'}).reset_index()

data['AVG_SALES'] = data['AMOUNT']/data['STORE_COUNT']
data['AVG_CUST'] = data['LYLTY_CARD_NBR']/data['STORE_COUNT']
data.head()
```

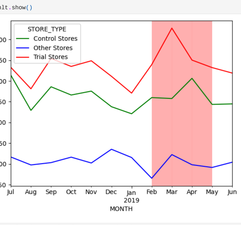
Out[ ]:

	STORE_TYPE	MONTH	AMOUNT	LYLTY_CARD_NBR	STORE_COUNT	AVG_SALES	AVG_CUST
0	Control Stores	2018-07	2442.40	262	3	814.133333	87.333333
1	Control Stores	2018-08	2187.45	246	3	729.150000	82.000000
2	Control Stores	2018-09	2358.00	252	3	786.000000	84.000000
3	Control Stores	2018-10	2298.40	256	3	766.133333	85.333333
4	Control Stores	2018-11	2326.60	252	3	775.533333	84.000000

In [ ]:
```
# evaluating total sales amongst the three store types
total_sales = data.pivot_table(index = 'MONTH', columns = 'STORE_TYPE', values = 'AVG_SALES')
total_sales.plot(color=['green', 'blue', 'red'])
months_to_shade = [('2019-02', '2019-03'), ('2019-03', '2019-04'), ('2019-04', '2019-05')]

for start, end in months_to_shade:
    plt.axvspan(start, end, color = 'red', alpha = 0.3, linewidth = 0.1)

plt.show()
```



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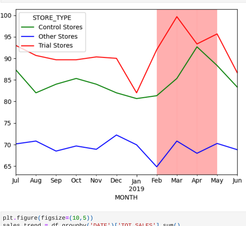
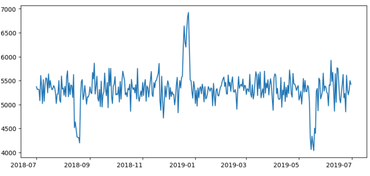


In [ ]:
```
plt.figure(figsize=(10,5))
sales_trend = df.groupby('DATE')['TOT_SALES'].sum()
sales_trend.plot(x='DATE', y='TOT_SALES')
plt.xlabel('')
plt.xticks(rotation = 360)
plt.show()
```


7000
6500
6000
5500
5000
4500
4000
2018-07
2018-09
2018-11
2019-01
2019-03
2019-05
2019-07