Data preparation and customer analytics Task 1 from quantium

Deploying the six phases of data analytics; Ask, Prepare, Process, Analyze, Visualize and Act.

Ask phase

The aim and objective of this analysis is to understand the type of customers who purchase chips and their purchasing behaviour within the region and our stakeholder is Mrs Julia the chips category manager.

Prepare process

In [1]:
```
#   let us import some necessary libraries and read our datasets
```

In [2]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from datetime import datetime
import seaborn as sns
sns.set()
%matplotlib inline
```

In [3]:
```
trans_df = pd.read_excel("QVI_transaction_data.xlsx")
behave_df = pd.read_csv("QVI_purchase_behaviour.csv")
```

In [4]:
```
#    Let us see how our datasets are organised
```

In [5]:
```
1 trans_df.head(10)
```

Out[5]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PROD_QTY	TO
0	43390	1	1000	1	5	Natural Chip Compny SeaSalt175g	2	
1	43599	1	1307	348	66	CCs Nacho Cheese 175g	3	
2	43605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	2	
3	43329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	5	
4	43330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	3	
5	43604	4	4074	2982	57	Old El Paso Salsa Dip Tomato Mild 300g	1	
6	43601	4	4149	3333	16	Smiths Crinkle Chips Salt & Vinegar 330g	1	
7	43601	4	4196	3539	24	Grain Waves Sweet Chilli 210g	1	
8	43332	5	5026	4525	42	Doritos Corn Chip Mexican Jalapeno 150g	1	
9	43330	7	7150	6900	52	Grain Waves Sour Cream&Chives 210G	2	

In [6]:
```
1 trans_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 264836 entries, 0 to 264835
Data columns (total 8 columns):
 #   Column          Non-Null Count   Dtype  
---  ------          --------------   -----  
 0   DATE            264836 non-null  int64  
 1   STORE_NBR       264836 non-null  int64  
 2   LYLTY_CARD_NBR  264836 non-null  int64  
 3   TXN_ID          264836 non-null  int64  
 4   PROD_NBR        264836 non-null  int64  
 5   PROD_NAME       264836 non-null  object 
 6   PROD_QTY        264836 non-null  int64  
 7   TOT_SALES       264836 non-null  float64
dtypes: float64(1), int64(6), object(1)
memory usage: 16.2+ MB
```

In [7]:
```
1 trans_df.describe()
```

Out[7]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_Q
count	264836.000000	264836.00000	2.648360e+05	2.648360e+05	264836.000000	264836.000
mean	43464.036260	135.08011	1.355495e+05	1.351583e+05	56.583157	1.907
std	105.389282	76.78418	8.057998e+04	7.813303e+04	32.826638	0.643
min	43282.000000	1.00000	1.000000e+03	1.000000e+00	1.000000	1.000
25%	43373.000000	70.00000	7.002100e+04	6.760150e+04	28.000000	2.000
50%	43464.000000	130.00000	1.303575e+05	1.351375e+05	56.000000	2.000
75%	43555.000000	203.00000	2.030942e+05	2.027012e+05	85.000000	2.000
max	43646.000000	272.00000	2.373711e+06	2.415841e+06	114.000000	200.000

In [8]:
```
1 trans_df.isna().sum()
```

Out[8]:
```
DATE              0
STORE_NBR         0
LYLTY_CARD_NBR    0
TXN_ID            0
PROD_NBR          0
PROD_NAME         0
PROD_QTY          0
TOT_SALES         0
dtype: int64
```

In [9]:
```
1 #    from the transaction dataset we see that "DATE" is in integer datatyp
```

In [10]:
```
1 behave_df.head(10)
```

Out[10]:

	LYLTY_CARD_NBR	LIFESTAGE	PREMIUM_CUSTOMER
0	1000	YOUNG SINGLES/COUPLES	Premium
1	1002	YOUNG SINGLES/COUPLES	Mainstream
2	1003	YOUNG FAMILIES	Budget
3	1004	OLDER SINGLES/COUPLES	Mainstream
4	1005	MIDAGE SINGLES/COUPLES	Mainstream
5	1007	YOUNG SINGLES/COUPLES	Budget
6	1009	NEW FAMILIES	Premium
7	1010	YOUNG SINGLES/COUPLES	Mainstream
8	1011	OLDER SINGLES/COUPLES	Mainstream
9	1012	OLDER FAMILIES	Mainstream

In [11]:
```
1 behave_df.describe()
```

Out[11]:

	LYLTY_CARD_NBR
count	7.263700e+04
mean	1.361859e+05
std	8.989293e+04
min	1.000000e+03
25%	6.620200e+04
50%	1.340400e+05
75%	2.033750e+05
max	2.373711e+06

In [12]:
```
1 behave_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 72637 entries, 0 to 72636
Data columns (total 3 columns):
 #   Column            Non-Null Count  Dtype 
---  ------            --------------  ----- 
 0   LYLTY_CARD_NBR    72637 non-null  int64 
 1   LIFESTAGE         72637 non-null  object
 2   PREMIUM_CUSTOMER  72637 non-null  object
dtypes: int64(1), object(2)
memory usage: 1.7+ MB
```

In [13]:
```
1 behave_df.isna().sum()
```

Out[13]:
```
LYLTY_CARD_NBR      0
LIFESTAGE           0
PREMIUM_CUSTOMER    0
dtype: int64
```

In [14]:
```
1 #    Fom the customer behaviour dataset we can see there no missing and  t
```

The two datasets given align with the findings as they are reliable, original, comprehensive and cited though they are not current.

Process phase

In [15]:
```
1 #    Let us duplicate our datasets before cleaning
```

In [16]:
```
1 trans_df
```

Out[16]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PROD_QT
0	43390	1	1000	1	5	Natural Chip Compny SeaSalt175g	
1	43599	1	1307	348	66	CCs Nacho Cheese 175g	
2	43605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	
3	43329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	
4	43330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	
...	...	...	...	...	...	...	
264831	43533	272	272319	270088	89	Kettle Sweet Chilli And Sour Cream 175g	
264832	43325	272	272358	270154	74	Tostitos Splash Of Lime 175g	
264833	43410	272	272379	270187	51	Doritos Mexicana 170g	
264834	43461	272	272379	270188	42	Doritos Corn Chip Mexican Jalapeno 150g	
264835	43365	272	272380	270189	74	Tostitos Splash Of Lime 175g	

264836 rows × 8 columns

In [17]:
```
1 #    Let us convert "DATE" datatype to datetime
```

In [18]:
```
1 trans_df["DATE"] = pd.to_datetime(trans_df["DATE"])
```

In [19]:
```
1 trans_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 264836 entries, 0 to 264835
Data columns (total 8 columns):
 #   Column          Non-Null Count   Dtype
---  ------          --------------   -----
 0   DATE            264836 non-null  datetime64[ns]
 1   STORE_NBR       264836 non-null  int64
 2   LYLTY_CARD_NBR  264836 non-null  int64
 3   TXN_ID          264836 non-null  int64
 4   PROD_NBR        264836 non-null  int64
 5   PROD_NAME       264836 non-null  object
 6   PROD_QTY        264836 non-null  int64
 7   TOT_SALES       264836 non-null  float64
dtypes: datetime64[ns](1), float64(1), int64(5), object(1)
memory usage: 16.2+ MB
```

In [20]:
```
1 #    we now have our DATE in datetime. let us create DAY column
```

In [21]:
```
1 trans_df["DAY"] = pd.DatetimeIndex(trans_df["DATE"]).day_name()
```

In [22]:
```
1 trans_df
```

Out[22]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g
...	...	...	...	...	...	...
264831	1970-01-01 00:00:00.000043533	272	272319	270088	89	Kettle Sweet Chilli And Sour Cream 175g
264832	1970-01-01 00:00:00.000043325	272	272358	270154	74	Tostitos Splash Of Lime 175g
264833	1970-01-01 00:00:00.000043410	272	272379	270187	51	Doritos Mexicana 170g
264834	1970-01-01 00:00:00.000043461	272	272379	270188	42	Doritos Corn Chip Mexican Jalapeno 150g
264835	1970-01-01 00:00:00.000043365	272	272380	270189	74	Tostitos Splash Of Lime 175g

264836 rows × 9 columns

In [23]:
```
1 #    let us create month column
```

In [24]:
```
1 trans_df["MONTH"] = pd.DatetimeIndex(trans_df["DATE"]).month_name()
```

In [25]:
```
1 trans_df
```

Out[25]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g
...	...	...	...	...	...	...
264831	1970-01-01 00:00:00.000043533	272	272319	270088	89	Kettle Sweet Chilli And Sour Cream 175g
264832	1970-01-01 00:00:00.000043325	272	272358	270154	74	Tostitos Splash Of Lime 175g
264833	1970-01-01 00:00:00.000043410	272	272379	270187	51	Doritos Mexicana 170g
264834	1970-01-01 00:00:00.000043461	272	272379	270188	42	Doritos Corn Chip Mexican Jalapeno 150g
264835	1970-01-01 00:00:00.000043365	272	272380	270189	74	Tostitos Splash Of Lime 175g

264836 rows × 10 columns

In [26]:
```
1 #    Let us create YEAR column
```

In [27]:
```
1 trans_df["YEAR"] = pd.DatetimeIndex(trans_df["DATE"]).year
```

In [28]:
```
1 trans_df
```

Out[28]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g
...	...	...	...	...	...	...
264831	1970-01-01 00:00:00.000043533	272	272319	270088	89	Kettle Sweet Chilli And Sour Cream 175g
264832	1970-01-01 00:00:00.000043325	272	272358	270154	74	Tostitos Splash Of Lime 175g
264833	1970-01-01 00:00:00.000043410	272	272379	270187	51	Doritos Mexicana 170g
264834	1970-01-01 00:00:00.000043461	272	272379	270188	42	Doritos Corn Chip Mexican Jalapeno 150g
264835	1970-01-01 00:00:00.000043365	272	272380	270189	74	Tostitos Splash Of Lime 175g

264836 rows × 11 columns

In [29]:
```
1 #    we have successfully added DAY, MONTH and YEAR column to our trans da
2 #    Let us work on the inconsistency in PROD_NAME column
```

In [30]:
```
1 def remove_prod(df):
2     unwanted = "salsa"
3     if unwanted in df["PROD_NAME"].lower().split():
4         return df.name
```

In [31]:
```
1 drop_index = list(trans_df.apply(remove_prod, axis = 1))
```

In [32]:
```
1 old_df = trans_df.copy()
```

In [33]:
```
#    Making a copy of all transaction and updating the new transactions wi
old_df = trans_df.copy()
trans_df = trans_df.drop([i for i in drop_index if ~np.isnan(i)])
```

In [34]:
```
print("Total Trans: "+str(len(old_df)))
print("Total Salsa Products: "+str(len(old_df)-len(trans_df)))
print("Trans without Salsa: "+str(len(trans_df)))
```

```
Total Trans: 264836
Total Salsa Products: 18094
Trans without Salsa: 246742
```

In [35]:
```
#    let us remove outliers that may skew our analysis
```

In [36]:
```
trans_df[trans_df.PROD_QTY > 100]
```

Out[36]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME
69762	1970-01-01 00:00:00.000043331	226	226000	226201	4	Dorito Corn Chp Supreme 380g
69763	1970-01-01 00:00:00.000043605	226	226000	226210	4	Dorito Corn Chp Supreme 380g

In [37]:
```
trans_df = trans_df[trans_df['PROD_QTY'] < 200].reset_index(drop=True)
trans_df.describe()
```

Out[37]:

	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_QTY	TOT_SA
count	246740.000000	2.467400e+05	2.467400e+05	246740.000000	246740.000000	246740.00
mean	135.050361	1.355303e+05	1.351304e+05	56.352213	1.906456	7.31
std	76.786971	8.071520e+04	7.814760e+04	33.695235	0.342499	2.47
min	1.000000	1.000000e+03	1.000000e+00	1.000000	1.000000	1.70
25%	70.000000	7.001500e+04	6.756875e+04	26.000000	2.000000	5.80
50%	130.000000	1.303670e+05	1.351815e+05	53.000000	2.000000	7.40
75%	203.000000	2.030832e+05	2.026522e+05	87.000000	2.000000	8.80
max	272.000000	2.373711e+06	2.415841e+06	114.000000	5.000000	29.50

In [38]:
```
def packet_size(grp):
    string = grp["PROD_NAME"]
    num = []
    for i in string:
        if i.isdigit():
            num.append(i)
    number = "".join(num)
    return int(number)
```

In [39]:
```
trans_df["PACKET_SIZE"] = trans_df.apply(packet_size,axis=1)
trans_df.head()
```

Out[39]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PR
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g	
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g	
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	

In [40]:
```
print("Largest Packet Size: "+str(max(trans_df["PACKET_SIZE"]))+"g")
print("Smallest Packet Size: "+str(min(trans_df["PACKET_SIZE"]))+"g")
```

```
Largest Packet Size: 380g
Smallest Packet Size: 70g
```

In [41]:
```
#   let us create some columns for better analysis
```

In [42]:
```
def Product_Company(grp):
    return grp["PROD_NAME"].split()[0]
```

In [43]:
```
trans_df["BRAND"] = trans_df.apply(Product_Company,axis=1)
trans_df.head()
```

Out[43]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PR
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g	
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g	
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	

In [44]:
```
def Product_Company(grp):
    return grp["PROD_NAME"].split()[-1]
```

In [45]:
```
trans_df["value"] = trans_df.apply(Product_Company,axis=1)
trans_df.head()
```

Out[45]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PR
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g	
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g	
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	

In [46]:
```
trans_df["value"].unique()
```

Out[46]:
```
array(['SeaSalt175g', '175g', '170g', '150g', '330g', '210g', '210G',
       '270g', '220g', '125g', '110g', '134g', '150G', 'Chli&S/Cream175G',
       'Chckn175g', '380g', 'Chicken270g', '180g', '165g', 'Salt', '250g',
       'Chs&Onion170g', '200g', '160g', 'CutSalt/Vinegr175g', '190g',
       '90g', '70g'], dtype=object)
```

In [47]:
```
def Product_Company(grp):
    return grp["PROD_NAME"].split()[-1][-4:]
```

In [48]:
```
trans_df["o_value"] = trans_df.apply(Product_Company,axis=1)
trans_df.head()
```

Out[48]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PR
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g	
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g	
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	

In [49]:
```
trans_df["PACKET_SIZE"] = trans_df["o_value"]
```

In [50]:
```
1 trans_df
```

Out[50]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME
0	1970-01-01 00:00:00.000043390	1	1000	1	5	Natural Chip Compny SeaSalt175g
1	1970-01-01 00:00:00.000043599	1	1307	348	66	CCs Nacho Cheese 175g
2	1970-01-01 00:00:00.000043605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g
3	1970-01-01 00:00:00.000043329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g
4	1970-01-01 00:00:00.000043330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g
...	...	...	...	...	...	...
246735	1970-01-01 00:00:00.000043533	272	272319	270088	89	Kettle Sweet Chilli And Sour Cream 175g
246736	1970-01-01 00:00:00.000043325	272	272358	270154	74	Tostitos Splash Of Lime 175g
246737	1970-01-01 00:00:00.000043410	272	272379	270187	51	Doritos Mexicana 170g
246738	1970-01-01 00:00:00.000043461	272	272379	270188	42	Doritos Corn Chip Mexican Jalapeno 150g
246739	1970-01-01 00:00:00.000043365	272	272380	270189	74	Tostitos Splash Of Lime 175g

246740 rows × 15 columns

In [51]:
```
1 trans_df = trans_df.drop(["o_value","value","DATE"], axis = 1)
```

In [52]:
```
d = {'red':'RRD','ww':'WOOLWORTHS','ncc':'NATURAL','snbts':'SUNBITES','inf
trans_df['BRAND'] = trans_df['BRAND'].str.lower().replace(d).str.upper()
trans_df.head(10)
```

Out[52]:

	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PROD_QTY	TOT_SALE
0	1	1000	1	5	Natural Chip Compny SeaSalt175g	2	6
1	1	1307	348	66	CCs Nacho Cheese 175g	3	6
2	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	2	2
3	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	5	15
4	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	3	13
5	4	4149	3333	16	Smiths Crinkle Chips Salt & Vinegar 330g	1	5
6	4	4196	3539	24	Grain Waves Sweet Chilli 210g	1	3
7	5	5026	4525	42	Doritos Corn Chip Mexican Jalapeno 150g	1	3
8	7	7150	6900	52	Grain Waves Sour Cream&Chives 210G	2	7
9	7	7215	7176	16	Smiths Crinkle Chips Salt & Vinegar 330g	1	5

In [53]:
```
1 trans_df.PACKET_SIZE.value_counts().sort_values()
```

Out[53]:
```
125g     1454
175G     1461
180g     1468
150G     1498
70g      1507
220g     1564
160g     2970
190g     2995
90g      3008
210G     3105
210g     3167
250g     3169
Salt     3257
200g     4473
270g     6285
380g     6416
330g    12540
165g    15297
170g    19983
110g    22387
134g    25102
150g    38705
175g    64929
Name: PACKET_SIZE, dtype: int64
```

In [54]:
```
1 #    you can see out PACKET_SIZE column is still not yet consistent. let u
```

In [55]:
```
1 b = {'G':'g','salt':'175g'}
```

In [56]:
```
1 trans_df['PACKET_SIZE'] = trans_df['PACKET_SIZE'].str.lower().replace(b)
```

In [57]:
```
1 trans_df.PACKET_SIZE.value_counts().sort_values()
```

Out[57]:
```
125g     1454
180g     1468
70g      1507
220g     1564
160g     2970
190g     2995
90g      3008
250g     3169
200g     4473
210g     6272
270g     6285
380g     6416
330g    12540
165g    15297
170g    19983
110g    22387
134g    25102
150g    40203
175g    69647
Name: PACKET_SIZE, dtype: int64
```

In [58]:
```
1 behave_df.head()
```

Out[58]:

	LYLTY_CARD_NBR	LIFESTAGE	PREMIUM_CUSTOMER
0	1000	YOUNG SINGLES/COUPLES	Premium
1	1002	YOUNG SINGLES/COUPLES	Mainstream
2	1003	YOUNG FAMILIES	Budget
3	1004	OLDER SINGLES/COUPLES	Mainstream
4	1005	MIDAGE SINGLES/COUPLES	Mainstream

Analyze phase

In [59]:
```
1 #    Let us combined our datasets
```

In [60]:
```
combined_data = trans_df.join(behave_df.set_index('LYLTY_CARD_NBR'), on =
combined_data.head()
```

Out[60]:

	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PROD_QTY	TOT_SALE
0	1	1000	1	5	Natural Chip Compny SeaSalt175g	2	6
1	1	1307	348	66	CCs Nacho Cheese 175g	3	6
2	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	2	2
3	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	5	15
4	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	3	13

In [61]:
```
combined_data.isna().sum()
```

Out[61]:
```
STORE_NBR           0
LYLTY_CARD_NBR      0
TXN_ID              0
PROD_NBR            0
PROD_NAME           0
PROD_QTY            0
TOT_SALES           0
DAY                 0
MONTH               0
YEAR                0
PACKET_SIZE         0
BRAND               0
LIFESTAGE           0
PREMIUM_CUSTOMER    0
dtype: int64
```

In [62]:
```
combined_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 246740 entries, 0 to 246739
Data columns (total 14 columns):
 #   Column            Non-Null Count   Dtype  
---  ------            --------------   -----  
 0   STORE_NBR         246740 non-null  int64  
 1   LYLTY_CARD_NBR    246740 non-null  int64  
 2   TXN_ID            246740 non-null  int64  
 3   PROD_NBR          246740 non-null  int64  
 4   PROD_NAME         246740 non-null  object 
 5   PROD_QTY          246740 non-null  int64  
 6   TOT_SALES         246740 non-null  float64
 7   DAY               246740 non-null  object 
 8   MONTH             246740 non-null  object 
 9   YEAR              246740 non-null  int64  
 10  PACKET_SIZE       246740 non-null  object 
 11  BRAND             246740 non-null  object 
 12  LIFESTAGE         246740 non-null  object 
 13  PREMIUM_CUSTOMER  246740 non-null  object 
dtypes: float64(1), int64(6), object(7)
memory usage: 26.4+ MB
```

In [63]:
```
trans_df["YEAR"].nunique()
```

Out[63]: 1

In [64]:
```
trans_df["YEAR"].unique()
```

Out[64]: array([1970], dtype=int64)

In [65]:
```
trans_df["MONTH"].nunique()
```

Out[65]: 1

In [66]:
```
trans_df["MONTH"].unique()
```

Out[66]: array(['January'], dtype=object)

In [67]:
```
trans_df["DAY"].nunique()
```

Out[67]: 1

In [68]:
```
trans_df["DAY"].unique()
```

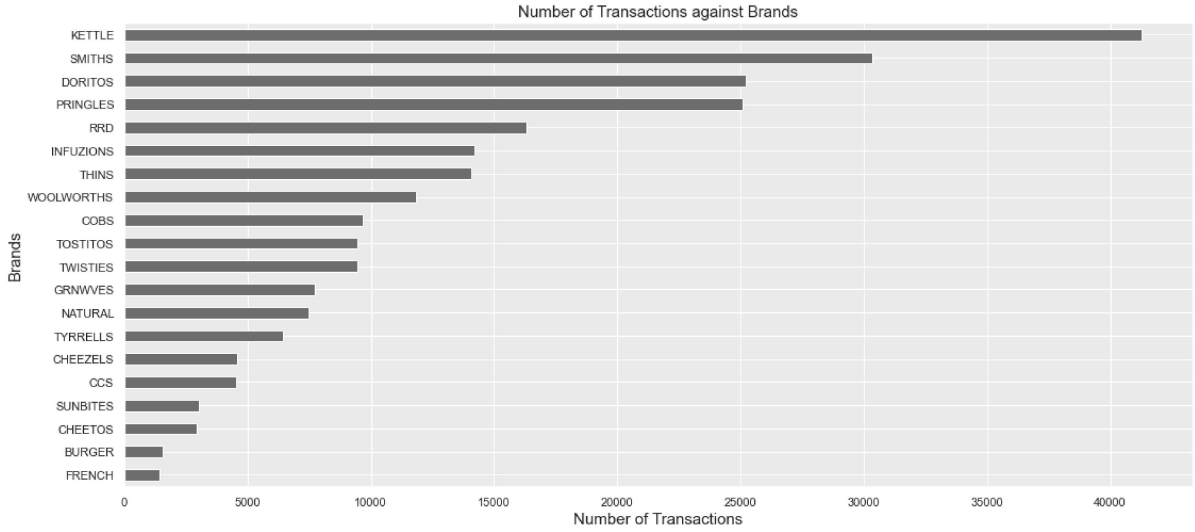
Out[68]: array(['Thursday'], dtype=object)

In [69]:
```
#    It was a dataset collected on Thursday January 1970
```

Share phase

In [70]:
```
plt.xlabel('Number of Transactions',{'fontsize':15})
plt.ylabel('Brands',{'fontsize':15})
trans_df.BRAND.value_counts().sort_values().plot(kind='barh',figsize=(18,8
print("figure 1.0")
plt.title("Number of Transactions against Brands",{'fontsize':15});
```

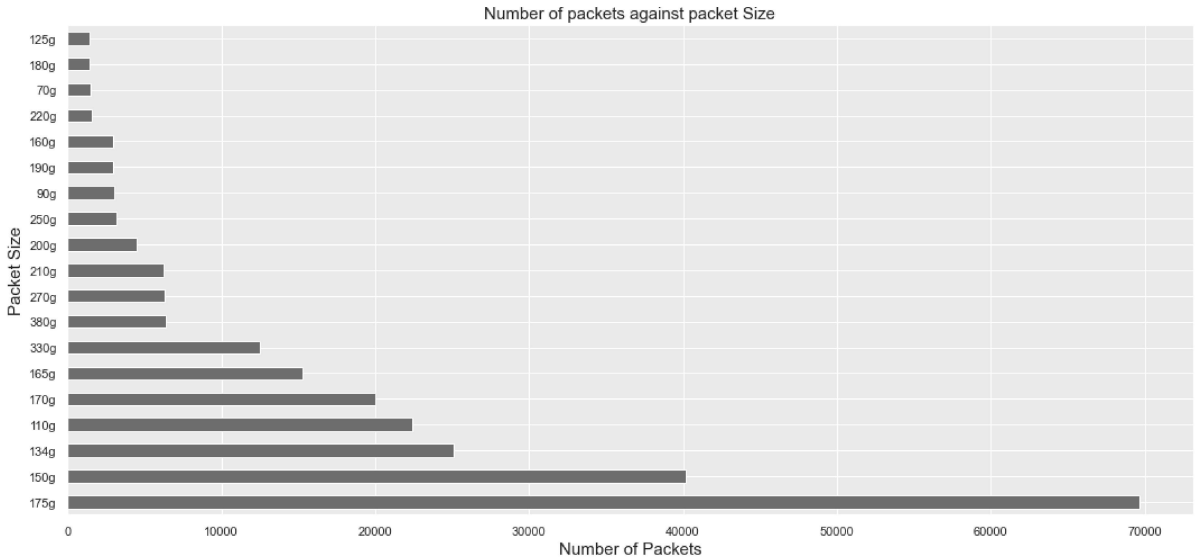
figure 1.0



In [71]:
```
#    people purchase more product KETTLE and SMITHS while less FRENCH and
```

In [72]:
```
plt.xlabel('Number of Packets',{'fontsize':15})
plt.ylabel('Packet Size',{'fontsize':15})
trans_df.PACKET_SIZE.value_counts().plot(kind='barh',figsize=(18,8))
plt.xticks(rotation='horizontal')
print("figure 2.0")
plt.title("Number of packets against packet Size", {'fontsize':15});
```

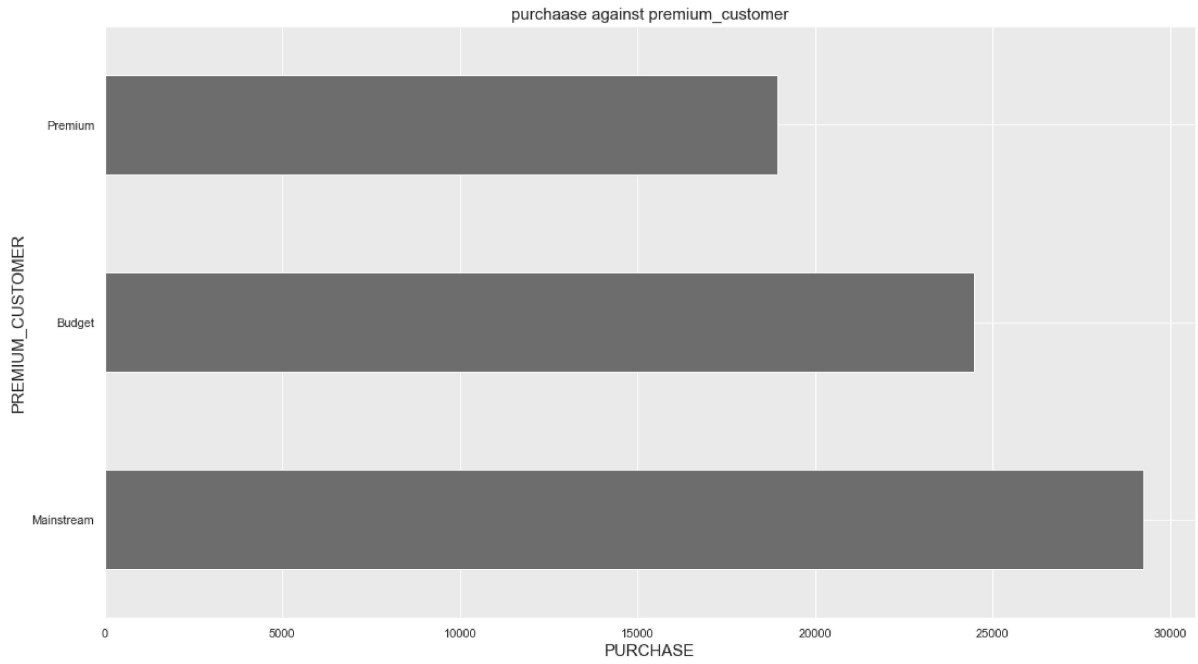
figure 2.0



In [ ]:
```
1
```

In [73]:
```
1 behave_df["PREMIUM_CUSTOMER"].value_counts().plot(kind = "barh",figsize =
2 plt.xlabel('PURCHASE',{'fontsize':15})
3 plt.ylabel('PREMIUM_CUSTOMER',{'fontsize':15})
4 print("figure 3.0")
5 plt.title("purchaase against premium_customer",{"fontsize":15});
```

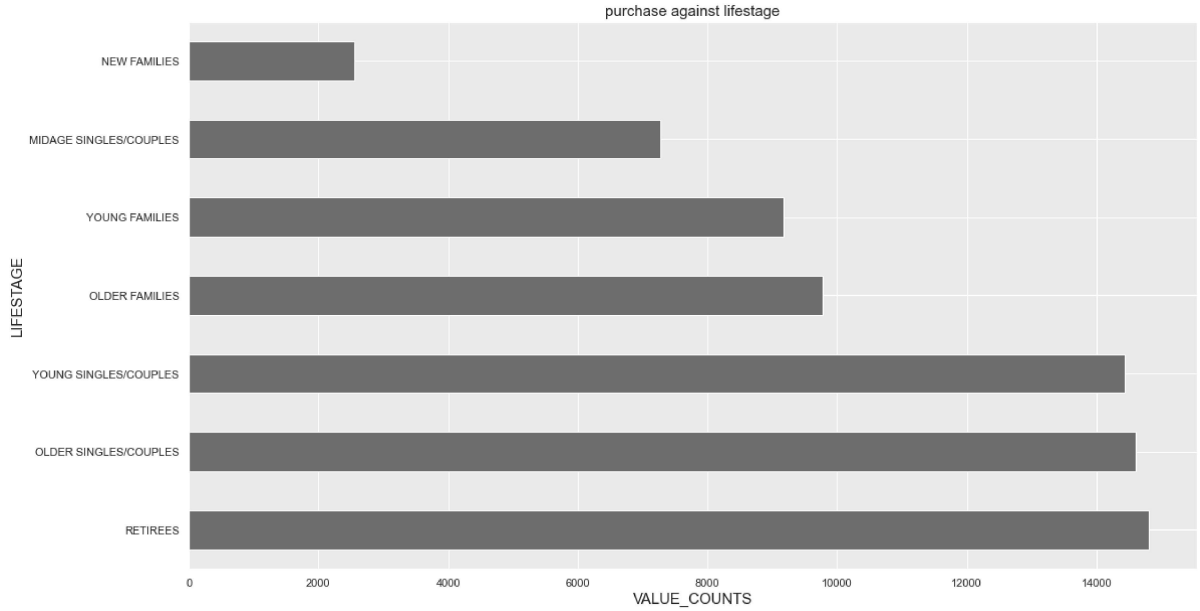
```
figure 3.0
```



In [74]:
```
1 #    mainstream purchase most while premium purchase least
```

In [75]:
```
behave_df["LIFESTAGE"].value_counts().plot(kind = "barh",figsize = (18,10)
plt.xlabel("VALUE_COUNTS",{'fontsize':15})
plt.ylabel('LIFESTAGE',{'fontsize':15});
print("figure 4.0")
plt.title("purchase against lifestage",{"fontsize":15});
```

```
figure 4.0
```

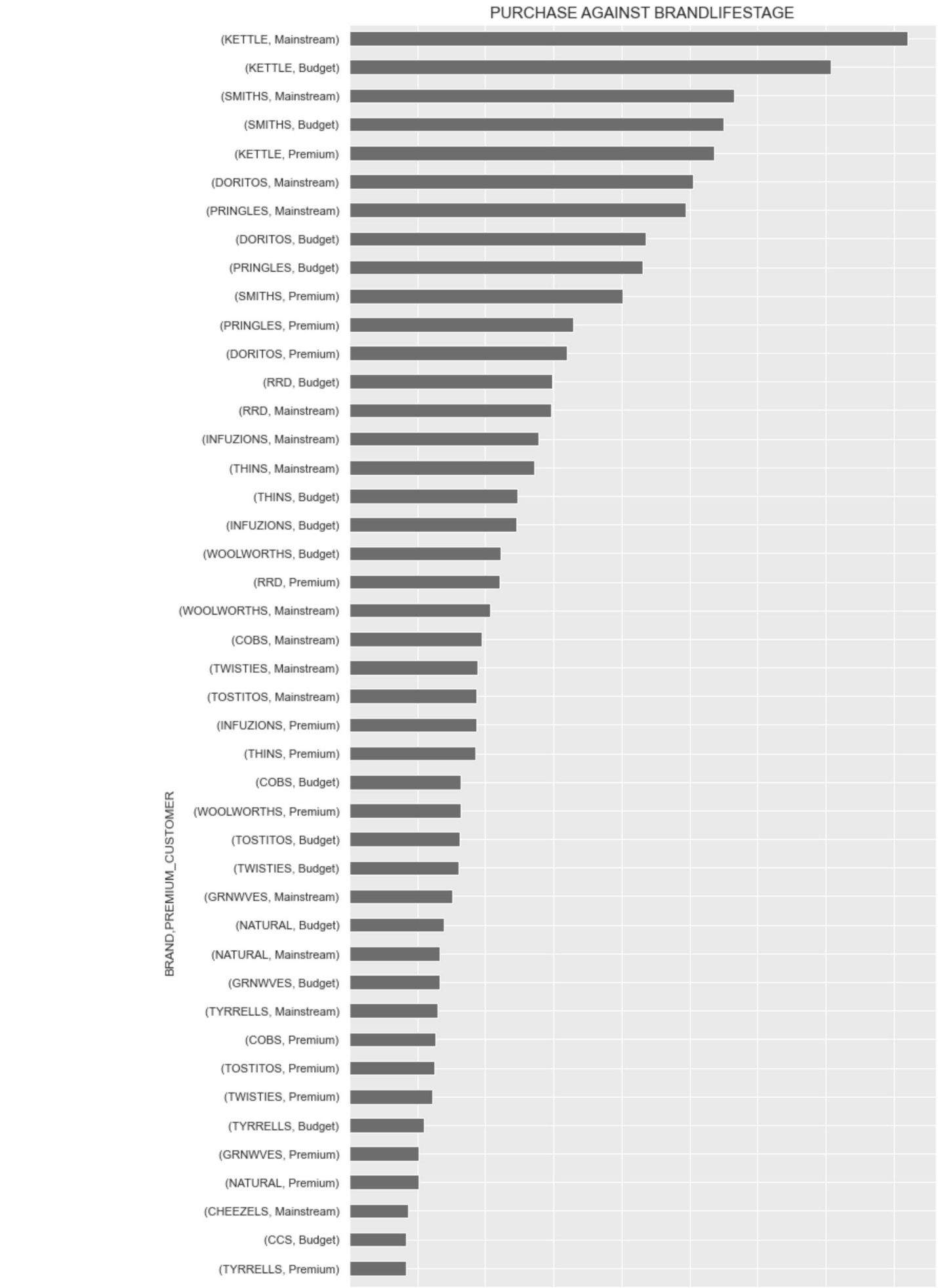


In [76]:
```
#    from the chat above you can see that the working class LIFESTAGE purc
```

In [77]:
```
BRANDgrp = combined_data["PREMIUM_CUSTOMER"].groupby(combined_data["BRAND"
```

In [78]:
```
BRANDgrp.plot(kind = "barh",figsize = (10,30));
print("figure 5.0")
plt.title("PURCHASE AGAINST BRANDLIFESTAGE",{"fontsize":15});
```

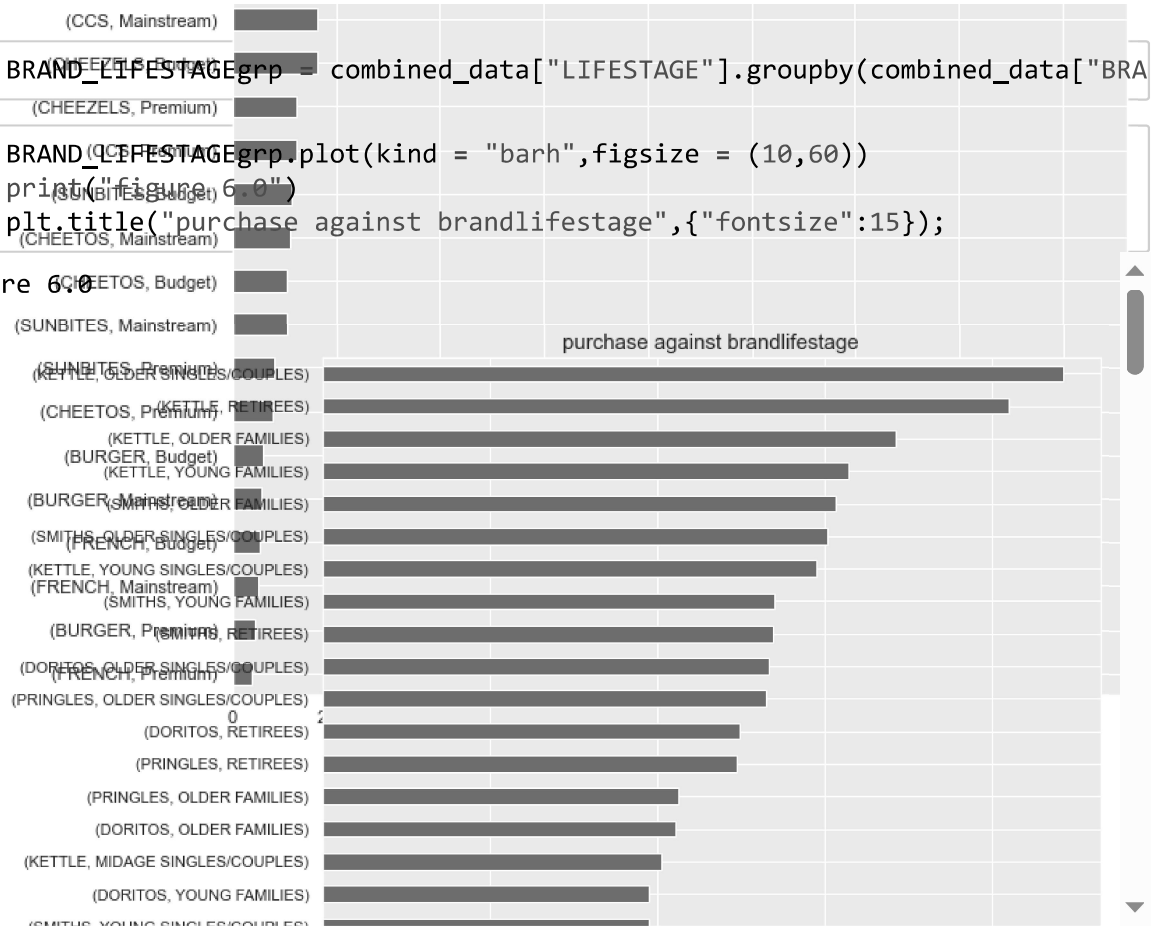
```
figure 5.0
```


PURCHASE AGAINST BRANDLIFESTAGE
BRAND,PREMIUM_CUSTOMER
(KETTLE, Mainstream)
(KETTLE, Budget)
(SMITHS, Mainstream)
(SMITHS, Budget)
(KETTLE, Premium)
(DORITOS, Mainstream)
(PRINGLES, Mainstream)
(DORITOS, Budget)
(PRINGLES, Budget)
(SMITHS, Premium)
(PRINGLES, Premium)
(DORITOS, Premium)
(RRD, Budget)
(RRD, Mainstream)
(INFUZIONS, Mainstream)
(THINS, Mainstream)
(THINS, Budget)
(INFUZIONS, Budget)
(WOOLWORTHS, Budget)
(RRD, Premium)
(WOOLWORTHS, Mainstream)
(COBS, Mainstream)
(TWISTIES, Mainstream)
(TOSTITOS, Mainstream)
(INFUZIONS, Premium)
(THINS, Premium)
(COBS, Budget)
(WOOLWORTHS, Premium)
(TOSTITOS, Budget)
(TWISTIES, Budget)
(GRNWVES, Mainstream)
(NATURAL, Budget)
(NATURAL, Mainstream)
(GRNWVES, Budget)
(TYRRELLS, Mainstream)
(COBS, Premium)
(TOSTITOS, Premium)
(TWISTIES, Premium)
(TYRRELLS, Budget)
(GRNWVES, Premium)
(NATURAL, Premium)
(CHEEZELS, Mainstream)
(CCS, Budget)
(TYRRELLS, Premium)

In [79]:
```
BRAND_LIFESTAGEgrp = combined_data["LIFESTAGE"].groupby(combined_data["BRA
```

In [80]:
```
BRAND_LIFESTAGEgrp.plot(kind = "barh",figsize = (10,60))
print("figure 6.0")
plt.title("purchase against brandlifestage",{"fontsize":15});
```

figure 6.0



Act phase

CONCLUSION

1 The dataset was collected thursday january 19O7

2 Kettle and smiths brands are most demanded

3 French and Burger brands are least demanded

4 Mainstream premium customer purchase more

5 Premium purchase least

6 Working class lifestage purchase least

7 Not working class purchase more

RECOMMENDATIONS

The dataset should not be relied on when making decisions as it is not a good sample size

ASSUMPTIONS

I assumed the product_name variable comprises of only chips and salsa during my analysis

In [81]:
```
1 combined_data.to_csv("task1.csv")
```

In [ ]:
```
1
```