Importing Libraries we are going to use

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sb
```

Data Collection

Read the excel file

```
data= pd.read excel("coffee-house-satisfactory-survey.xlsx")
data
                        Timestamp 1. Your Gender
                                                     2. Your Age \
                                           Female
                                                   From 20 to 29
     2019/10/01 12:38:43 PM GMT+8
                                           Female From 20 to 29
1
     2019/10/01 12:38:54 PM GMT+8
2
                                             Male From 20 to 29
     2019/10/01 12:38:56 PM GMT+8
3
     2019/10/01 12:39:08 PM GMT+8
                                           Female From 20 to 29
                                             Male From 20 to 29
4
     2019/10/01 12:39:20 PM GMT+8
117
     2019/10/04 12:24:26 AM GMT+8
                                             Male
                                                   40 and above
118
     2019/10/04 9:30:09 AM GMT+8
                                             Male From 20 to 29
119
                                             Male From 20 to 29
      2019/10/04 1:46:07 PM GMT+8
120
     2019/10/05 11:01:14 AM GMT+8
                                           Female From 20 to 29
121
                                             Male From 20 to 29
      2019/10/05 4:57:22 PM GMT+8
    3. Are you currently....? 4. What is your annual income? \
                      Student
                                           Less than RM25,000
1
                      Student
                                           Less than RM25,000
2
                     Employed
                                           Less than RM25,000
3
                                           Less than RM25,000
                      Student
4
                                           Less than RM25,000
                      Student
117
                Self-employed
                                          RM25,000 - RM50,000
118
                     Employed
                                           Less than RM25,000
119
                      Student
                                           Less than RM25,000
120
                                           Less than RM25,000
                     Employed
121
                     Employed
                                         RM50,000 - RM100,000
    5. How often do you visit Coffee House? \
0
                                      Rarely
1
                                      Rarely
2
                                     Monthly
3
                                      Rarely
4
                                     Monthly
```

```
117
                                      Monthly
118
                                      Monthly
119
                                       Rarely
120
                                       Rarely
121
                                       Rarely
    6. How do you usually enjoy Coffee House?
                                        Dine in
1
                                      Take away
2
                                        Dine in
3
                                      Take away
4
                                      Take away
                                        Dine in
117
118
                                        Dine in
119
                                        Dine in
120
                                      Take away
121
                                        Dine in
    7. How much time do you normally spend during your visit? \
0
                           Between 30 minutes to 1 hour
1
                                        Below 30 minutes
2
                           Between 30 minutes to 1 hour
3
                                        Below 30 minutes
4
                           Between 30 minutes to 1 hour
117
                              Between 1 hour to 2 hours
                              Between 1 hour to 2 hours
118
119
                           Between 30 minutes to 1 hour
120
                                        Below 30 minutes
121
                           Between 30 minutes to 1 hour
    8. The nearest Coffee House's outlet to you is...?
0
                                              within 1km
1
                                               1km - 3km
2
                                           more than 3km
3
                                           more than 3km
4
                                               1km - 3km
117
                                               1km - 3km
                                               1km - 3km
118
119
                                               1km - 3km
                                              within 1km
120
121
                                               1km - 3km
    9. Do you have Coffee House membership card?
                                               Yes
1
                                               Yes
2
                                               Yes
3
                                                No
```

4 117 118 119 120 121	No Yes Yes No No
<pre>11. On average, how much would you spend visit? \ 0</pre>	at Coffee House per than RM20
	than RM20
	than RM20
	than RM20
4 Around Ri	M20 - RM40
117	N20 DM40
	M20 - RM40
	than RM40
	than RM20
120 Less	than RM20
121 Less	than RM20
12. How would you rate the quality of Coother brands (Coffee Bean, Old Town White Coo	
1	4
2	4
3	2
4	3
117	3
118	5

119	3
120	4
121	1
0 1 2 3 4	13. How would you rate the price range at Coffee House? \ 3 3 3 1 1 3
117 118 119 120 121	3 5 2 4 1
	14. How important are sales and promotions in your purchase
deci 0	sion? \ 5
1	4
2	4
3	4
4	4
117	5
118	5
119	4
120	4
121	5
	15. How would you rate the ambiance at Coffee House? (lighting, c, etc) \
0	5
1	4

2	4
3	3
4	2
117	3
118	5
119	3
120	4
121	4
16. You rate the WiFi quality at Coffee Ho 0 1 2 3	4 4 4 3 2
117 118 119 120 121	2 5 3 4 3
17. How would you rate the service at Coff friendliness, etc) $\$	
0	4
1	5
2	4
3	3
4	3
117	4
118	5
119	3

120	4
121	3
meet	18. How likely you will choose Coffee House for doing business ings or hangout with friends? \
0	3
1	2
2	3
3	3
4	3
117	4
118	5
119	4
120	4
121	2
	10 Hay do you came to been of manuations at Coffee Hayes 2 Cheek
all	19. How do you come to hear of promotions at Coffee House? Check that apply. \
0	Starbucks Website/Apps;Social Media;Emails;Dea
1	Social Media;In Store displays
2	In Store displays;Billboards
3	Through friends and word of mouth
4	Starbucks Website/Apps;Social Media
117	Starbucks Website/Apps;Social Media
118	Starbucks Website/Apps;Social Media;Emails;Dea
119	Social Media; Through friends and word of mouth
120	Social Media; Through friends and word of mouth

```
121
                                         In Store displays
    20. Will you continue buying Coffee House?
0
                                                Yes
1
2
                                                Yes
3
                                                 No
4
                                                Yes
                                                . . .
117
                                                Yes
118
                                                Yes
119
                                                 No
120
                                                Yes
121
                                                 No
[122 rows x 21 columns]
```

Data Cleaning

Let's know our current data columns

```
data.columns
Index(['Timestamp', '1. Your Gender', '2. Your Age',
       '3. Are you currently....?', '4. What is your annual income?',
       '5. How often do you visit Coffee House?'
       '6. How do you usually enjoy Coffee House?',
       '7. How much time do you normally spend during your visit?',
       '8. The nearest Coffee House's outlet to you is...?',
       '9. Do you have Coffee House membership card?',
       '10. What do you most frequently purchase at Coffee House?',
       '11. On average, how much would you spend at Coffee House per
visit?',
       '12. How would you rate the quality of Coffee House compared to
other brands (Coffee Bean, Old Town White Coffee..) to be: ',
       '13. How would you rate the price range at Coffee House?',
       '14. How important are sales and promotions in your purchase
decision?',
       '15. How would you rate the ambiance at Coffee House?
(lighting, music, etc...)',
       '16. You rate the WiFi quality at Coffee House as..',
       '17. How would you rate the service at Coffee House?
(Promptness, friendliness, etc..)',
       '18. How likely you will choose Coffee House for doing business
meetings or hangout with friends?',
       '19. How do you come to hear of promotions at Coffee House?
```

Renaming columns to shorter names for improved manageability

```
data.rename(columns={'Timestamp': 'Timestamp', '1. Your Gender':
'Gender','2. Your Age': 'Age','3. Are you currently....?':
'Current','4. What is your annual income?': 'Income','5. How often do
you visit Coffee House?': 'Visits','6. How do you usually enjoy Coffee
House?': 'Enjoyment','7. How much time do you normally spend during
your visit?': 'Duration', "8. The nearest Coffee House's outlet to you
is...?": 'Distance','9. Do you have Coffee House membership card?':
'MembershipCard','10. What do you most frequently purchase at Coffee
House?': 'FavProduct','11. On average, how much would you spend at
Coffee House per visit?': 'SpendingLimit','12. How would you rate the
quality of Coffee House compared to other brands (Coffee Bean, Old
Town White Coffee...) to be: ': 'Quality', '13. How would you rate the
price range at Coffee House?': 'PriceRange','14. How important are
sales and promotions in your purchase decision?':
'PromotionImportance','15. How would you rate the ambiance at Coffee
House? (lighting, music, etc...)': 'Ambiance','16. You rate the WiFi
quality at Coffee House as..': 'WifiQuality','17. How would you rate
the service at Coffee House? (Promptness, friendliness, etc..)':
'Service','18. How likely you will choose Coffee House for doing
business meetings or hangout with friends?': 'BussinessMeetings','19.
How do you come to hear of promotions at Coffee House? Check all that
apply.': 'Advertiser','20. Will you continue buying Coffee House?':
'ContinueBuying'}, inplace=True)
```

Verifying the presence of null values in the dataset.

```
data.isnull().sum().sum()
2
```

Identifying the columns where null values exist

```
data.isnull().sum()
                         0
Timestamp
Gender
                         0
                         0
Aae
                         0
Current
                         0
Income
                         0
Visits
                         1
Enjoyment
Duration
                         0
Distance
                         0
```

```
MembershipCard
FavProduct
                        0
SpendingLimit
                        0
Quality
                        0
                        0
PriceRange
PromotionImportance
                        0
                        0
Ambiance
WifiQuality
                        0
                        0
Service
BussinessMeetings
                        0
Advertiser
                        1
                        0
ContinueBuying
dtype: int64
```

Identifying the rows where null values exist

```
rows with null = data[data.isnull().any(axis=1)]
rows with null
                                                    Current \
                    Timestamp Gender
                                               Age
81 2019/10/03 9:11:28 AM GMT+8
                               Male From 20 to 29
                                                   Employed
               Income Visits Enjoyment
                                              Duration
Distance \
81 Less than RM25,000 Never
                                 NaN Below 30 minutes more than
3km
  MembershipCard ... SpendingLimit Quality PriceRange
PromotionImportance \
              No ...
                              Zero
                                        1
1
   Ambiance WifiQuality Service BussinessMeetings Advertiser \
81
    3
  ContinueBuying
81
[1 rows x 21 columns]
```

Removing this row as the individual's review lacks credibility due to the absence of a visit

Student 2 2019/10/01 12:38:56 PM GMT+8	Male From 20 to 29
Employed 3 2019/10/01 12:39:08 PM GMT+8 Fe	male From 20 to 29
Student 4 2019/10/01 12:39:20 PM GMT+8	Male From 20 to 29
Student	riace from 20 to 25
117 2019/10/04 12:24:26 AM GMT+8 employed	Male 40 and above Self-
118 2019/10/04 9:30:09 AM GMT+8 Employed	Male From 20 to 29
119 2019/10/04 1:46:07 PM GMT+8 Student	Male From 20 to 29
120 2019/10/05 11:01:14 AM GMT+8 Fe Employed	male From 20 to 29
121 2019/10/05 4:57:22 PM GMT+8 Employed	Male From 20 to 29
Income Visits E	njoyment
	Dine in Between 30 minutes to 1
hour 1 Less than RM25,000 Rarely T	ake away Below 30
minutes 2 Less than RM25,000 Monthly	Dine in Between 30 minutes to 1
hour 3 Less than RM25,000 Rarely T	ake away Below 30
_	ake away Between 30 minutes to 1
hour	
 117 RM25,000 - RM50,000 Monthly	Dine in Between 1 hour to 2
hours	
118 Less than RM25,000 Monthly hours	
119 Less than RM25,000 Rarely hour	Dine in Between 30 minutes to 1
120 Less than RM25,000 Rarely T minutes	ake away Below 30
	Dine in Between 30 minutes to 1
Distance MembershipCard	1 3 .
0 within 1km Yes 1 1km - 3km Yes	
2 more than 3km Yes	

3	more than 3km 1km - 3km	No No		Less than Around RM20	- RM40	2 3
117 118 119	1km - 3km 1km - 3km 1km - 3km	Yes Yes No		Around RM20 - More than Less than	n RM40	3 5 3
120 121	within 1km 1km - 3km	No No		Less thar Less thar		4 1
Serv	PriceRange Pro	motionImporta	nce A	mbiance Wifi(Quality	
0	3		5	5	4	4
1	3		4	4	4	5
2	3		4	4	4	4
3	1		4	3	3	3
4	3		4	2	2	3
117	3		5	3	2	4
118	5		5	5	5	5
119	2		4	3	3	3
120	4		4	4	4	4
121	1		5	4	3	3
Adve	BussinessMeetirrtiser \					
0 Medi	a;Emails;Dea	3 Starbucks	Websi	te/Apps;Social	L	
1 disp	lavs	2		Social Med	dia;In Stor	е
2	•	3		In Store	9	
3	lays;Billboards	3		Through frier	nds and wor	d of
mout 4		3	5	starbucks Websi	ite/Apps;So	cial
Medi 	a					
117		4	5	starbucks Websi	ite/Apps;So	cial
Medi	a					

```
118
                          Starbucks Website/Apps;Social
Media; Emails; Dea...
119
                      4
                          Social Media; Through friends and word of
mouth...
120
                          Social Media; Through friends and word of
mouth...
                      2
121
                                                            In Store
displays
    ContinueBuying
0
                Yes
1
                Yes
2
                Yes
3
                 No
4
                Yes
117
                Yes
118
                Yes
119
                 No
120
                Yes
121
                 No
[121 rows x 21 columns]
```

Verifying the presence of null values in the dataset.

```
data.isnull().sum().sum()
0
```

Verifying the presence of duplicated values in the dataset.

```
data.duplicated().sum()
0
```

Identify the unique values in each column for more in-depth analysis

```
for column in data.columns:
    unique_values = data[column].unique()
    print("\nUnique values in '{}' column:".format(column))
    print(unique_values)

Unique values in 'Timestamp' column:
['2019/10/01 12:38:43 PM GMT+8' '2019/10/01 12:38:54 PM GMT+8'
    '2019/10/01 12:38:56 PM GMT+8' '2019/10/01 12:39:08 PM GMT+8'
    '2019/10/01 12:39:20 PM GMT+8' '2019/10/01 12:39:39 PM GMT+8'
    '2019/10/01 12:39:42 PM GMT+8' '2019/10/01 12:40:58 PM GMT+8'
```

```
'2019/10/01 12:42:27 PM GMT+8'
                                '2019/10/01 12:43:36 PM GMT+8'
'2019/10/01 12:47:00 PM GMT+8'
                                '2019/10/01 12:48:26 PM GMT+8'
'2019/10/01 12:49:25 PM GMT+8'
                                '2019/10/01 12:53:09 PM GMT+8'
'2019/10/01 12:53:16 PM GMT+8'
                                '2019/10/01 12:57:31 PM GMT+8'
                                '2019/10/01 1:08:15 PM GMT+8'
'2019/10/01 12:59:11 PM GMT+8'
'2019/10/01 1:09:12 PM GMT+8'
                               '2019/10/01 1:13:03 PM GMT+8'
                               '2019/10/01 1:14:43 PM GMT+8'
'2019/10/01 1:13:45 PM GMT+8'
'2019/10/01 1:21:50 PM GMT+8'
                               '2019/10/01 1:24:04 PM GMT+8'
'2019/10/01 1:24:21 PM GMT+8'
                               '2019/10/01 1:25:56 PM GMT+8'
'2019/10/01 1:29:11 PM GMT+8'
                               '2019/10/01 1:33:54 PM GMT+8'
                               '2019/10/01 1:37:27 PM GMT+8'
'2019/10/01 1:34:30 PM GMT+8'
'2019/10/01 1:39:16 PM GMT+8'
                               '2019/10/01 1:40:23 PM GMT+8'
'2019/10/01 1:45:12 PM GMT+8'
                               '2019/10/01 1:45:43 PM GMT+8'
                               '2019/10/01 1:51:56 PM GMT+8'
'2019/10/01 1:51:47 PM GMT+8'
'2019/10/01 1:53:05 PM GMT+8'
                               '2019/10/01 1:55:52 PM GMT+8'
'2019/10/01 1:57:01 PM GMT+8'
                               '2019/10/01 2:00:32 PM GMT+8'
'2019/10/01 2:03:08 PM GMT+8'
                               '2019/10/01 2:06:24 PM GMT+8'
'2019/10/01 2:27:41 PM GMT+8'
                               '2019/10/01 2:35:40 PM GMT+8'
'2019/10/01 2:41:01 PM GMT+8'
                               '2019/10/01 2:41:31 PM GMT+8'
'2019/10/01 2:41:56 PM GMT+8'
                               '2019/10/01 2:42:02 PM GMT+8'
'2019/10/01 2:45:52 PM GMT+8'
                               '2019/10/01 3:08:53 PM GMT+8'
                               '2019/10/01 3:16:32 PM GMT+8'
'2019/10/01 3:12:11 PM GMT+8'
'2019/10/01 3:20:55 PM GMT+8'
                               '2019/10/01 3:21:16 PM GMT+8'
'2019/10/01 3:57:29 PM GMT+8'
                               '2019/10/01 4:02:35 PM GMT+8'
'2019/10/01 4:03:17 PM GMT+8'
                               '2019/10/01 4:03:57 PM GMT+8'
'2019/10/01 4:05:59 PM GMT+8'
                               '2019/10/01 6:19:46 PM GMT+8'
'2019/10/01 8:32:12 PM GMT+8'
                               '2019/10/02 12:13:06 AM GMT+8'
'2019/10/02 9:29:28 AM GMT+8'
                               '2019/10/02 7:14:30 PM GMT+8'
'2019/10/02 7:15:13 PM GMT+8'
                               '2019/10/02 7:15:27 PM GMT+8'
'2019/10/02 7:23:55 PM GMT+8'
                               '2019/10/02 7:27:56 PM GMT+8'
'2019/10/02 7:29:53 PM GMT+8'
                               '2019/10/02 7:31:32 PM GMT+8'
'2019/10/02 7:33:51 PM GMT+8'
                               '2019/10/02 8:04:41 PM GMT+8'
'2019/10/02 8:08:37 PM GMT+8'
                               '2019/10/02 8:29:35 PM GMT+8'
'2019/10/02 8:31:21 PM GMT+8'
                               '2019/10/02 8:35:08 PM GMT+8'
                               '2019/10/02 9:19:50 PM GMT+8'
'2019/10/02 8:52:13 PM GMT+8'
'2019/10/03 7:19:36 AM GMT+8'
                               '2019/10/03 7:21:08 AM GMT+8'
'2019/10/03 8:46:25 AM GMT+8'
                               2019/10/03 11:14:37 AM GMT+8'
'2019/10/03 11:14:44 AM GMT+8'
                                '2019/10/03 11:15:13 AM GMT+8'
'2019/10/03 11:17:27 AM GMT+8'
                                '2019/10/03 11:18:48 AM GMT+8'
'2019/10/03 11:22:03 AM GMT+8'
                                '2019/10/03 11:25:13 AM GMT+8'
'2019/10/03 11:32:03 AM GMT+8'
                                '2019/10/03 12:12:22 PM GMT+8'
'2019/10/03 12:13:56 PM GMT+8'
                                '2019/10/03 1:30:06 PM GMT+8'
'2019/10/03 2:13:11 PM GMT+8'
                               '2019/10/03 2:34:09 PM GMT+8'
'2019/10/03 3:11:13 PM GMT+8'
                               '2019/10/03 3:44:13 PM GMT+8'
'2019/10/03 4:25:38 PM GMT+8'
                               '2019/10/03 4:41:10 PM GMT+8'
'2019/10/03 5:19:31 PM GMT+8'
                               '2019/10/03 6:24:46 PM GMT+8'
'2019/10/03 6:31:44 PM GMT+8'
                               '2019/10/03 6:35:21 PM GMT+8'
'2019/10/03 6:41:20 PM GMT+8'
                               '2019/10/03 6:44:10 PM GMT+8'
'2019/10/03 6:45:28 PM GMT+8' '2019/10/03 6:46:53 PM GMT+8'
```

```
'2019/10/03 7:00:47 PM GMT+8' '2019/10/03 7:14:53 PM GMT+8'
 '2019/10/03 7:40:31 PM GMT+8' '2019/10/03 7:43:00 PM GMT+8'
 '2019/10/03 7:47:00 PM GMT+8' '2019/10/03 7:58:17 PM GMT+8'
 '2019/10/03 8:58:26 PM GMT+8' '2019/10/03 9:25:36 PM GMT+8'
 '2019/10/03 10:38:42 PM GMT+8' '2019/10/03 11:24:55 PM GMT+8'
 '2019/10/04 12:24:26 AM GMT+8' '2019/10/04 9:30:09 AM GMT+8'
 '2019/10/04 1:46:07 PM GMT+8' '2019/10/05 11:01:14 AM GMT+8'
 '2019/10/05 4:57:22 PM GMT+8'l
Unique values in 'Gender' column:
['Female' 'Male']
Unique values in 'Age' column:
['From 20 to 29' 'From 30 to 39' '40 and above' 'Below 20']
Unique values in 'Current' column:
['Student' 'Employed' 'Self-employed' 'Housewife']
Unique values in 'Income' column:
['Less than RM25,000' 'RM50,000 - RM100,000' 'RM25,000 - RM50,000'
'RM100,000 - RM150,000' 'More than RM150,000']
Unique values in 'Visits' column:
['Rarely' 'Monthly' 'Weekly' 'Never' 'Daily']
Unique values in 'Enjoyment' column:
['Dine in' 'Take away' 'Drive-thru' 'never' 'Never buy' 'I dont like coffee' 'Never']
Unique values in 'Duration' column:
['Between 30 minutes to 1 hour' 'Below 30 minutes' 'More than 3 hours'
 'Between 1 hour to 2 hours' 'Between 2 hours to 3 hours']
Unique values in 'Distance' column:
['within 1km' '1km - 3km' 'more than 3km']
Unique values in 'MembershipCard' column:
['Yes' 'No']
Unique values in 'FavProduct' column:
['Coffee' 'Cold drinks;Pastries' 'Coffee;Sandwiches' 'Cold drinks'
 'Coffee;Cold drinks' 'Cold drinks;Pastries;Sandwiches'
 'Coffee; Juices; Pastries; Sandwiches' 'Coffee; Pastries; Sandwiches'
 'Coffee; Pastries' 'Cold drinks; Juices; Pastries'
 'Coffee; Cold drinks; Pastries; Sandwiches' 'Never' 'Jaws chip' 'cake'
 'Pastries' 'Cold drinks; Never' 'never' 'Nothing'
 'Coffee;Cold drinks;Juices;Pastries;Sandwiches'
Unique values in 'SpendingLimit' column:
['Less than RM20' 'Around RM20 - RM40' 'More than RM40' 'Zero']
```

```
Unique values in 'Quality' column:
[4 2 3 5 1]
Unique values in 'PriceRange' column:
[3 1 5 2 4]
Unique values in 'PromotionImportance' column:
[5 4 3 2 1]
Unique values in 'Ambiance' column:
[5 4 3 2 1]
Unique values in 'WifiQuality' column:
[4 3 2 5 1]
Unique values in 'Service' column:
[4 5 3 2 1]
Unique values in 'BussinessMeetings' column:
[3 2 4 5 1]
Unique values in 'Advertiser' column:
['Starbucks Website/Apps; Social Media; Emails; Deal sites (fave, iprice,
etc...)'
 'Social Media;In Store displays' 'In Store displays;Billboards'
 'Through friends and word of mouth' 'Starbucks Website/Apps; Social
Media'
 'Social Media'
 'Starbucks Website/Apps; Social Media; Emails; Through friends and word
of mouth'
 'Starbucks Website/Apps;Social Media;Through friends and word of
mouth'
 'Social Media; Through friends and word of mouth'
 'Social Media;Through friends and word of mouth;In Store displays'
 'Starbucks Website/Apps' 'Emails' 'Social Media; Emails'
 'Through friends and word of mouth; In Store displays'
 'Social Media;In Store displays;Billboards' 'Application offer'
 'Starbucks Website/Apps;Social Media;Through friends and word of
mouth; In Store displays'
 'In Store displays'
 'Social Media; Through friends and word of mouth; Billboards'
 'Starbucks Website/Apps; Social Media; Emails; Billboards'
 'Social Media; Emails; Deal sites (fave, iprice, etc...); Through
friends and word of mouth; In Store displays; Billboards'
 'Starbucks Website/Apps; Social Media; Deal sites (fave, iprice,
etc...); Through friends and word of mouth'
 'Never hear'
 'Social Media; Through friends and word of mouth; In Store
displays; Billboards'
```

```
'Starbucks Website/Apps;Deal sites (fave, iprice, etc...)'
'Social Media;Deal sites (fave, iprice, etc...);Through friends and
word of mouth'
'Social Media;Emails;Through friends and word of mouth'
'Social Media;Deal sites (fave, iprice, etc...)'
'Starbucks Website/Apps;Emails' 'Billboards'
'Starbucks Website/Apps;Social Media;Emails;Deal sites (fave, iprice, etc...);Through friends and word of mouth;In Store
displays;Billboards']
Unique values in 'ContinueBuying' column:
['Yes' 'No']
```

Data Preprocessing

Filtering out reviews from individuals that lack credibility due to the absence of a visit

neverVisitsData neverVisitsData	= data[data['Vis:	its'] == 'Never']
	Timestamp	Gender Age Current
\ 40 2019/10/01	2:03:08 PM GMT+8	Female From 20 to 29 Employed
44 2019/10/01	2:41:01 PM GMT+8	Female Below 20 Student
46 2019/10/01	2:41:56 PM GMT+8	Female Below 20 Student
67 2019/10/02	7:27:56 PM GMT+8	Female From 20 to 29 Self-employed
92 2019/10/03	1:30:06 PM GMT+8	Female From 20 to 29 Employed
107 2019/10/03	7:00:47 PM GMT+8	Female Below 20 Student
108 2019/10/03	7:14:53 PM GMT+8	Male From 20 to 29 Student
112 2019/10/03	7:58:17 PM GMT+8	Male From 20 to 29 Student
Distance \	Income Visits	Enjoyment Duration
40 RM25,000 -	RM50,000 Never	Take away Below 30 minutes 1km
44 Less than - 3km	RM25,000 Never	never Below 30 minutes 1km
46 Less than	RM25,000 Never	Dine in Below 30 minutes more
67 Less than	RM25,000 Never	Never buy Below 30 minutes more

than 3km	DMEO OOO	Navas	Dina in	Dala: 20 m	
92 RM25,000 - within 1km	RM50,000	Never	Dine in	Below 30 m	inutes
107 Less than	RM25,000	Never	Never	Below 30 m	inutes more
than 3km 108 Less than	RM25 000	Never	never	Below 30 m	inutes
within 1km	14125,000	NCVCI	IICVCI	Be tow 50 III	inaces
112 More than R	M150,000	Never	Never	Below 30 m	inutes more
than 3km					
MembershipCa				lity Price	Range \
	No	Less than		4	4 3
	No	Less than	Zero RM20	3 3 3	
67	No		Zero	3	2 3 3 2
	No		Zero	3	3
	No		Zero	3 3	2 3
	No		Zero Zero	3 1	1
					_
PromotionIm BussinessMeeting		Ambiance	WifiQua	lity Servi	ce
40	4	4		4	4
4		·			•
44	3	3		3	3
3	-	4		2	2
46 5	5	4		3	3
67	3	3		3	3
3					
92	3	3		3	3
3 107	2	2		3	3
3	_			3	3
108	3	1		3	3
4 112	1	1		1	1
1				1	1
				A -1 1 -1	Cartina
				Advertiser	ContinueBuying
40			S	ocial Media	Yes
44			S	ocial Media	Yes
46	Thro	ough friend	ds and wo	rd of mouth	Yes
67				Never hear	No
92			S	ocial Media	No
J-2			3.	OCTUC FICULA	140

```
Starbucks Website/Apps; Social Media; Through fr...
                                                                Yes
108
                    Through friends and word of mouth
                                                                 No
112
                                           Billboards
                                                                 No
[8 rows x 21 columns]
data = data[data['Visits'] != 'Never']
data
                       Timestamp Gender
                                                   Age
Current \
    2019/10/01 12:38:43 PM GMT+8 Female From 20 to 29
Student
     2019/10/01 12:38:54 PM GMT+8 Female From 20 to 29
Student
    2019/10/01 12:38:56 PM GMT+8
                                    Male From 20 to 29
Employed
    2019/10/01 12:39:08 PM GMT+8
                                  Female From 20 to 29
Student
    2019/10/01 12:39:20 PM GMT+8
                                    Male From 20 to 29
Student
117
    2019/10/04 12:24:26 AM GMT+8
                                    Male 40 and above Self-
employed
     2019/10/04 9:30:09 AM GMT+8
                                    Male From 20 to 29
118
Employed
119
     2019/10/04 1:46:07 PM GMT+8
                                    Male From 20 to 29
Student
120 2019/10/05 11:01:14 AM GMT+8 Female From 20 to 29
Employed
    2019/10/05 4:57:22 PM GMT+8
                                    Male From 20 to 29
121
Employed
                  Income
                           Visits
                                   Enjoyment
Duration \
      Less than RM25,000
                           Rarely Dine in Between 30 minutes to 1
0
hour
      Less than RM25,000
                                                         Below 30
                           Rarely Take away
minutes
      Less than RM25,000
                          Monthly Dine in Between 30 minutes to 1
hour
3
      Less than RM25,000
                           Rarely Take away
                                                         Below 30
minutes
                          Monthly Take away Between 30 minutes to 1
      Less than RM25,000
hour
```

	RM25,000 - RM5	0,000	Monthly	Dine	in E	Between 1 ho	our to 2
hours 118	Less than RM2	5,000	Monthly	Dine	in E	Between 1 ho	our to 2
hours 119	Less than RM2	5,000	Rarely	Dine	in Betw	veen 30 minu	ites to 1
hour 120	Less than RM2	5,000	Rarely	Take a	way	Bel	.ow 30
minute 121 R hour	s M50,000 - RM10	0,000	Rarely	Dine	in Betw	veen 30 minu	ites to 1
	Distance M within 1km 1km - 3km nore than 3km nore than 3km 1km - 3km 1km - 3km 1km - 3km 1km - 3km nore 1km - 3km	embersh	Yes Yes No No Yes Yes Yes	Ard	Less th Less th Less th Less th Dund RM20 Dund RM20 More th Less th		4 4 4 2 3 3 5
121	1km - 3km	motionT	No No mportand	 ce Ambia	Less th	nan RM20 FiQuality	4 1
Servic 0		IIIO CIOITI	iiipor caric	5	5	4	4
1	3			4	4	4	5
2	3			4	4	4	4
3	1			4	3	3	3
4	3			4	2	2	3
4	3			4	2	2	3
				_			
117	3			5	3	2	4
118	5			5	5	5	5
119	2			4	3	3	3
120	4			4	4	4	4
121	1			5	4	3	3

```
BussinessMeetings
Advertiser \
                         Starbucks Website/Apps;Social
Media; Emails; Dea...
                      2
                                              Social Media; In Store
displays
                      3
                                                In Store
displays;Billboards
                      3
                                           Through friends and word of
mouth
                      3
                                        Starbucks Website/Apps; Social
Media
. .
117
                      4
                                        Starbucks Website/Apps;Social
Media
                      5
                         Starbucks Website/Apps; Social
118
Media; Emails; Dea...
                         Social Media; Through friends and word of
119
mouth...
                         Social Media; Through friends and word of
120
mouth...
                      2
                                                            In Store
121
displays
    ContinueBuying
0
                Yes
1
                Yes
2
                Yes
3
                 No
4
                Yes
117
                Yes
118
                Yes
119
                 No
120
                Yes
121
                 No
[113 rows x 21 columns]
```

Data Visualization

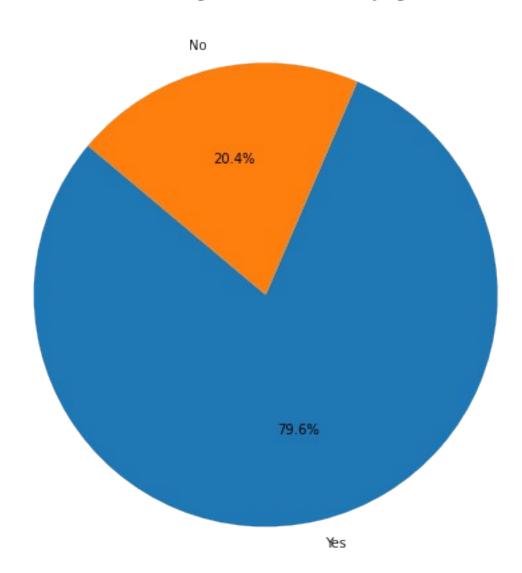
Visualizing the percentage of customers who continue to buy

```
ContinueBuying_counts=data['ContinueBuying'].value_counts()
ContinueBuying_counts
```

```
ContinueBuying
Yes 90
No 23
Name: count, dtype: int64

plt.figure(figsize=(8, 8))
plt.pie(ContinueBuying_counts, labels=ContinueBuying_counts.index,
autopct='%1.1f%%', startangle=140)
plt.title('Percentage of the Continue Buying')
plt.show()
```

Percentage of the Continue Buying



Why they are not continuing to purchase the products

Getting a dataset for the non-continual buying reviewers

data_of_no_conti data_of_no_conti		a [da	ata['Co	ntinueBu	ying']	==	' N	lo']
	-	Γime	estamp	Gender			F	lge
Current \ 3 2019/10/01 Student	12:39:08	PM	GMT+8	Female	From	20	to	29
11 2019/10/01 Student	12:48:26	PM	GMT+8	Female	From	20	to	29
14 2019/10/01 Student	12:53:16	PM	GMT+8	Female	From	20	to	29
15 2019/10/01 Employed	12:57:31	PM	GMT+8	Female	From	20	to	29
20 2019/10/01 Employed	1:13:45	PM	GMT+8	Male	From	30	to	39
22 2019/10/01 Employed	1:21:50	PM	GMT+8	Male	From	20	to	29
26 2019/10/01 Employed	1:29:11	PM	GMT+8	Male	From	30	to	39
33 2019/10/01 Employed	1:45:43	PM	GMT+8	Female	From	20	to	29
35 2019/10/01 Student	1:51:56	PM	GMT+8	Female	From	20	to	29
51 2019/10/01	3:16:32	PM	GMT+8	Female		Bel	OW	20
Student 64 2019/10/02	7:15:13	PM	GMT+8	Female	From	20	to	29
Employed 65 2019/10/02	2 7:15:27	PM	GMT+8	Female	From	20	to	29
Student 68 2019/10/02	2 7:29:53	РМ	GMT+8	Female	From	20	to	29
Employed 78 2019/10/03	3 7:19:36	AM	GMT+8	Female	From	20	to	29
Student 79 2019/10/03	3 7:21:08	AM	GMT+8	Female		Bel	OW	20
Student 80 2019/10/03	8:46:25	AM	GMT+8	Female	From	20	to	29
Employed 84 2019/10/03	11:15:13	AM	GMT+8	Male	From	20	to	29
Employed 104 2019/10/03 Student	8 6:44:10	PM	GMT+8	Male		Bel	OW	20
109 2019/10/03 Student	3 7:40:31	PM	GMT+8	Male	From	20	to	29

110 2019/10/03 7:43:00 PI Student	M GMT+8	Male From	20 to 29	
114 2019/10/03 9:25:36 PM	M GMT+8	Male 40 a	nd above S	Self-
employed 119 2019/10/04 1:46:07 PM	M GMT+8	Male From	20 to 29	
Student 121 2019/10/05 4:57:22 PM	M GMT+8	Male From	20 to 29	
Employed				
Income Duration \	Visits	Enjoyment		
3 Less than RM25,000	Rarely	Take away		Below 30
minutes 11 Less than RM25,000	Rarely	Dine in	Between 30	minutes to
1 hour 14 Less than RM25,000	Rarelv	Take away		Below 30
minutes	-	Take away		
15 Less than RM25,000 1 hour	,	Ź		
20 RM100,000 - RM150,000 minutes	Rarely	Take away		Below 30
22 RM25,000 - RM50,000 3 hours	Rarely	Dine in		More than
26 More than RM150,000	Rarely	Drive-thru		Below 30
minutes 33 RM25,000 - RM50,000	Rarely	Dine in	Between 30	minutes to
1 hour 35 Less than RM25,000	Rarelv	Take away		Below 30
minutes	-	-		
51 Less than RM25,000 minutes	-	Dine in		Below 30
64 Less than RM25,000 minutes	Rarely	Take away		Below 30
65 Less than RM25,000 1 hour	Rarely	Dine in	Between 30) minutes to
68 Less than RM25,000	Rarely	Dine in		Below 30
minutes 78 Less than RM25,000	Rarely	Take away		Below 30
minutes 79 Less than RM25,000	Rarelv	Take away		Below 30
minutes	-	Ź		
80 RM50,000 - RM100,000 3 hours	•	Drive-thru		More than
84 RM25,000 - RM50,000 2 hours	Rarely	Dine in	Betweer	n 1 hour to
104 Less than RM25,000 1 hour	Rarely	Drive-thru	Between 30) minutes to
less than RM25,000	Rarely	Dine in		Below 30
minutes				

110 Less than RM25,000 minutes	Rarely T	ake away	Bel	ow 30
114 RM25,000 - RM50,000 1 hour	Rarely	Dine in Betwe	een 30 minu	tes to
119 Less than RM25,000 1 hour	Rarely	Dine in Betwe	een 30 minu	tes to
121 RM50,000 - RM100,000 1 hour	Rarely	Dine in Betwe	een 30 minu	tes to
Distance Membershi more than 3km more than 3km within 1km more than 3km within 1km within 1km within 1km within 1km km - 3km more than 3km	No No Yes Yes Yes No	Spendingle Less than	RM20 RM20 RM20 RM40 RM20 RM20 RM20 RM20 Zero RM20 Zero RM20 RM40 RM40 RM40 RM40 RM20 RM20 RM20	ty \ 2
119 1km - 3km 121 1km - 3km	No No	Less than Less than		1
<pre>PriceRange PromotionIn Service \</pre>	nportance A	Ambiance WifiQu	uality	
3 1	4	3	3	3
11 2	4	4	3	4
14 2	5	5	5	5
15 1	5	4	3	4
20 2	5	3	3	4
22 2	5	5	2	4
26 2	4	4	4	4

33	2			3	3		3	4
35	2			4	4		3	4
51	3			2	2		2	4
64	1			5	3		4	4
65	3			2	4		3	4
68	1			5	4		4	4
78	1			5	2		2	2
79	2			3	2		2	2
80	2			4	3		1	3
84	2			4	3		4	4
104	4			4	4		4	4
109	3			3	3		3	3
110	2			3	5		4	4
114	2			1	2		2	3
119	2			4	3		3	3
121	1			5	4		3	3
Bussines Advertiser \	_	js 3		,	「hrough frie	ands a	nd word	of
mouth 11		4	C+arbucks I		_			
fr					e/Apps;Socia			
14 mouth		2	Social Med	ıa;Ihro	ough friends			
15 Website/Apps		4			S	Starbu	cks	
20 Media;Emails		3				Soc	ial	
22 mouth		3		٦	Through frie	ends a	nd word	of
26 offer		2				Α	pplicat:	ion
33 Media		3					Soc	ial

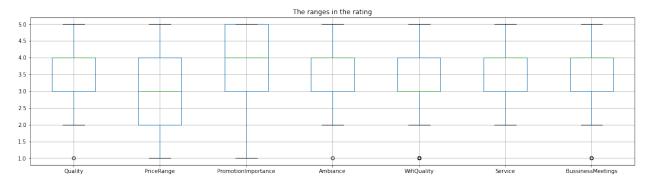
35	1	Social
Media 51	2	Cocial Modia. Through friends and word of
mouth	3	Social Media;Through friends and word of
64	5	Social
Media		300141
65	4	Through friends and word of
mouth		
68	1	Starbucks Website/Apps;Social Media;Through
fr	_	
78	2	Social Media;Through friends and word of
mouth 79	2	Social Media;Deal sites (fave, iprice,
etc)	2	Suctat Media, Deat Sites (Tave, Iprice,
80	3	Starbucks
Website/Apps		
84	4	In Store
displays		
104	4	Social
Media; Emails	2	C ' - 1
109 Media	2	Social
110	2	Social
Media		300141
114	2	In Store
displays		
119	4	Social Media; Through friends and word of
mouth	_	
121	2	In Store
displays		
ContinueBuying		
3 No		
11 No		
14 No		
15 No		
20 No		
No No		
26 No 33 No		
35 No		
51 No		
64 No		
65 No		
68 No		
78 No		
79 No 80 No		
84 No		
5 1		

```
104 No
109 No
110 No
114 No
119 No
121 No

[23 rows x 21 columns]
```

Creating visualizations to illustrate the distinctions between the data from all feedback contributors and the data from those who did not continue to buy

```
fig = plt.figure(figsize =(20, 5))
data.boxplot()
plt.title('The ranges in the rating')
plt.show()
```



```
fig = plt.figure(figsize =(20, 5))
data_of_no_continue.boxplot()
plt.title('The ranges in the rating for the not buying')
plt.show()
```



To correlate the features, the data should be numeric

Dropping the timestamp since it's considered an Index

```
data_notimestamp = data.drop('Timestamp', axis=1)
data_of_no_continue_notimestamp =
data_of_no_continue.drop('Timestamp', axis=1)
```

Encoding the unique values of each columns that we extracted earlier into numeric digits

```
mappings = {
    'Gender': {'Male': 1, 'Female': 2},
'Age': {'Below 20': 1, 'From 20 to 29': 2, 'From 30 to 39': 3, '40
and above': 4},
    'Current': {'Student': 1, 'Employed': 2, 'Self-employed': 3,
'Housewife': 4}.
    'Income': {'Less than RM25,000': 1, 'RM25,000 - RM50,000': 2,
'RM50,000 - RM100,000': 3, 'RM100,000 - RM150,000': 4, 'More than
RM150,000': 5},
    'Visits': {'Never': 1, 'Rarely': 2, 'Weekly': 3, 'Monthly': 4,
'Daily': 5},
    'Enjoyment': {'never': 1, 'Never': 2, 'Dine in': 3, 'Take away':
4, 'Drive-thru': 5, 'Never buy': 6, 'I dont like coffee': 7},
    'Duration': {'Below 30 minutes': 1, 'Between 30 minutes to 1
hour': 2, 'Between 1 hour to 2 hours': 3,
                  'Between 2 hours to 3 hours': 4, 'More than 3 hours':
5},
    'Distance' : {'within 1km': 1, '1km - 3km': 2, 'more than 3km':
3},
    'MembershipCard' : {'Yes': 1, 'No': 2},
    'FavProduct' : {'Coffee': 1, 'Cold drinks; Pastries': 2,
'Coffee; Sandwiches': 3, 'Cold drinks': 4, 'Coffee; Cold drinks': 5,
                           'Cold drinks; Pastries; Sandwiches': 6,
'Coffee; Juices; Pastries; Sandwiches': 7, 'Coffee; Pastries; Sandwiches':
8,
                           'Coffee; Pastries': 9, 'Cold
drinks; Juices; Pastries': 10, 'Coffee; Cold drinks; Pastries; Sandwiches':
11,
                           'Never': 12, 'Jaws chip': 13, 'cake': 14,
'Pastries': 15, 'Cold drinks; Never': 16, 'never': 17, 'Nothing': 18,
                           'Coffee:Cold
drinks; Juices; Pastries; Sandwiches': 19},
    'SpendingLimit' : {'Less than RM20': 1, 'Around RM20 - RM40': 2,
'More than RM40': 3, 'Zero': 4},
    'Quality': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'PriceRange': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'PromotionImportance': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'Ambiance': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'WifiQuality': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'Service': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'BussinessMeetings': {1: 1, 2: 2, 3: 3, 4: 4, 5: 5},
    'Advertiser' : {
    'Starbucks Website/Apps;Social Media;Emails;Deal sites (fave,
```

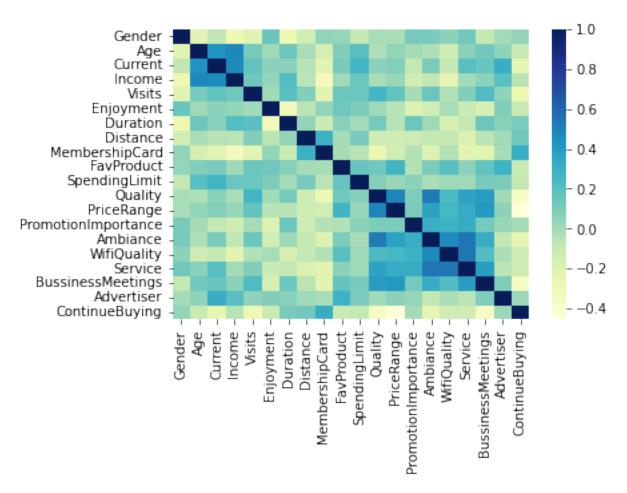
```
iprice, etc...)': 1,
    'Social Media; In Store displays': 2,
    'In Store displays; Billboards': 3,
    'Through friends and word of mouth': 4,
    'Starbucks Website/Apps; Social Media': 5,
    'Social Media': 6,
    'Starbucks Website/Apps; Social Media; Emails; Through friends and
word of mouth': 7.
    'Starbucks Website/Apps;Social Media;Through friends and word of
mouth': 8,
    'Social Media; Through friends and word of mouth': 9,
    'Social Media; Through friends and word of mouth; In Store
displays': 10,
    'Starbucks Website/Apps': 11,
    'Emails': 12,
    'Social Media; Emails': 13,
    'Through friends and word of mouth;In Store displays': 14,
    'Social Media;In Store displays;Billboards': 15,
    'Application offer': 16,
    'Starbucks Website/Apps;Social Media;Through friends and word of
mouth; In Store displays': 17,
    'In Store displays': 18,
    'Social Media;Through friends and word of mouth;Billboards': <mark>19</mark>,
    'Starbucks Website/Apps;Social Media;Emails;Billboards': 20,
    'Social Media; Emails; Deal sites (fave, iprice, etc...); Through
friends and word of mouth; In Store displays; Billboards': 21,
    'Starbucks Website/Apps; Social Media; Deal sites (fave, iprice,
etc...); Through friends and word of mouth': 22,
    'Never hear': 23,
    'Social Media; Through friends and word of mouth; In Store
displays; Billboards': 24,
    'Starbucks Website/Apps;Deal sites (fave, iprice, etc...)': <mark>25</mark>,
    'Social Media;Deal sites (fave, iprice, etc...);Through friends
and word of mouth': 26,
    'Social Media; Emails; Through friends and word of mouth': 27,
    'Social Media; Deal sites (fave, iprice, etc...)': 28,
    'Starbucks Website/Apps; Emails': 29,
    'Billboards': 30,
    'Starbucks Website/Apps;Social Media;Emails;Deal sites (fave,
iprice, etc...); Through friends and word of mouth; In Store
displays;Billboards': 31},
    'ContinueBuying' : {'Yes': 1, 'No': 2}
data notimestamp encoded = data notimestamp.apply(lambda col:
col.map(mappings.get(col.name, col)))
data_of_no_continue notimestamp encoded =
data of no continue notimestamp.apply(lambda col:
col.map(mappings.get(col.name, col)))
data notimestamp encoded
```

Gen		Age	Current	Income	Visits	Enjoyme	ent Du	ration	
Distance 0	2	2	1	1	2		3	2	
1	2	2	1	1	2		4	1	
2	1	2	2	1	4		3	2	
3	2	2	1	1	2		4	1	
1 2 2 3 3 3 4 2	1	2	1	1	4		4	2	
117 2	1	4	3	2	4		3	3	
118 2	1	2	2	1	4		3	3	
119 2	1	2	1	1	2		3	2	
120 1	2	2	2	1	2		4	1	
121 2	1	2	2	3	2		3	2	
	bers	hipCa	rd FavPr	oduct S	pendingL:	imit Qι	uality	PriceRan	ge \
			1	1 2		1 1	4 4		3
0 1 2 3 4			1 2	1 1		1 1	4 2		3 3 1
4			2	3		2	3		3
117 118			1 1	1 19		2 3	3 5		3 5
119 120			2	5 1		1 1	3 4		2 4
121		T	2	1	W; £; 0	1	1		1
Bussines	sMee	onimp tings	\	Ambiance		ality S			
3			5	5		4	4		
0 3 1 2 2 3 3 3 4 3			4	4		4	5		
3			4	4		4	4		
3			4	3		3	3		
4 3			4	2		2	3		

 117		5	3	2	4	
4		-	-	F	-	
118 5		5	5	5	5	
119		4	3	3	3	
4 120		4	4	4	4	
4		4	7	4	-	
121		5	4	3	3	
2						
ດ	Advertiser 1	ContinueBuy	_			
1			1 1 1			
9 1 2 3 4	2 3 4		1 2			
5 4	4 5		1			
117 118	5 31		1 1			
119	10		2			
120 121	19 18		1 2			
113	rows x 20 c	olumns]				

The correlations among the features in the dataset

```
dataplot = sb.heatmap(data_notimestamp_encoded.corr(), cmap="YlGnBu")
```



data_of_no_continue_notimestamp_encoded								
Gend	er	Age	Current	Income	Visits	Enjoyment	Duration	
Distance	/							
3	2	2	1	1	2	4	1	
3								
11	2	2	1	1	2	3	2	
3								
14	2	2	1	1	2	4	1	
1								
15	2	2	2	1	2	4	2	
3								
20	1	3	2	4	2	4	1	
1								
22	1	2	2	2	2	3	5	
1								
26	1	3	2	5	2	5	1	
2								
33	2	2	2	2	2	3	2	
2								
35	2	2	1	1	2	4	1	
	=		_	_	_		_	

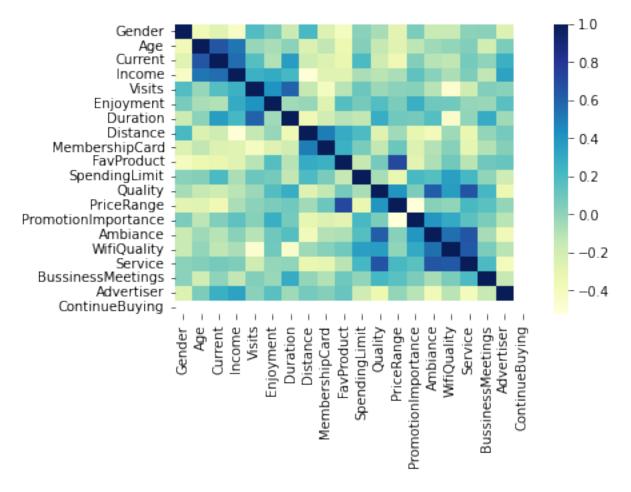
2									
3 51 3		2	1	1	1	2	3	1	
64		2	2	2	1	2	4	1	
3 65		2	2	1	1	2	3	2	
2 68		2	2	2	1	2	3	1	
3 78		2	2	1	1	2	4	1	
3 79		2	1	1	1	2	4	1	
3 80		2	2	2	3	4	5	5	
2 84		1	2	2	2	2	3	3	
3 104		1	1	1	1	2	5	2	
3 109		1	2	1	1	2	3	1	
3 110		1	2	1	1	2	4	1	
3 114		1	4	3	2	2	3	2	
3 119		1	2	1	1	2	3	2	
2 121		1	2	2	3	2	3	2	
2									
3 11 14 15 20 22 26 33 35 51 64 65 68 79 80 84 104	Membe	ershi	pCard 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		ct Spe 1 1 1 1 1 1 1 1 1 1 1 1 1	endingLimit 1 1 1 2 1 1 1 1 1 1 1 2 2 1 1 2 2 1 1 1 1 2	Quality 2 3 5 4 2 5 4 3 4 3 4 2 2 2 3 4 4	PriceRange 1 2 2 1 2 2 2 2 2 2 3 1 1 2 2 2 2 2 2 4	\

109 110 114 119 121	2 2 2 2 2 2	9 4 4 5 1	1 4 1 1	3 4 2 3 1	3 2 2 2 1
Buss	<pre>PromotionImportance inessMeetings \</pre>				
3	4	3	3	3	
11 4	4	4	3	4	
14	5	5	5	5	
2 15	5	4	3	4	
4 20	5	3	3	4	
3 22	5	5	2	4	
3					
26 2	4	4	4	4	
33 3	3	3	3	4	
3 35 1	4	4	3	4	
51	2	2	2	4	
3 64	5	3	4	4	
5 65	2	4	3	4	
4 68	5	4	4	4	
1					
78 2	5	2	2	2	
79 2	3	2	2	2	
80 3	4	3	1	3	
84	4	3	4	4	
4 104	4	4	4	4	
4 109	3	3	3	3	
2 110	3	5	4	4	
2					
114	1	2	2	3	

```
2
119
                             4
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121
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2
                     ContinueBuying
      Advertiser
3
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                  6
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68
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78
                28
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80
                 11
84
                18
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                13
109
                 6
                 6
110
                                      2
                18
114
119
                10
                                      2
121
                18
```

The correlations among the features in the dataset of non continue buying

```
dataplot = sb.heatmap(data_of_no_continue_notimestamp_encoded.corr(),
cmap="YlGnBu")
```



Using these correlations, the following features are considered the most influential in determining whether a customer continues or discontinues their purchasing behavior

Membership Card, Distance, Duration, PromotionImportance, Advertiser, Gender, Income, Enjoyment

Creating visualizations to illustrate the influence of the membership card on purchasing behavior

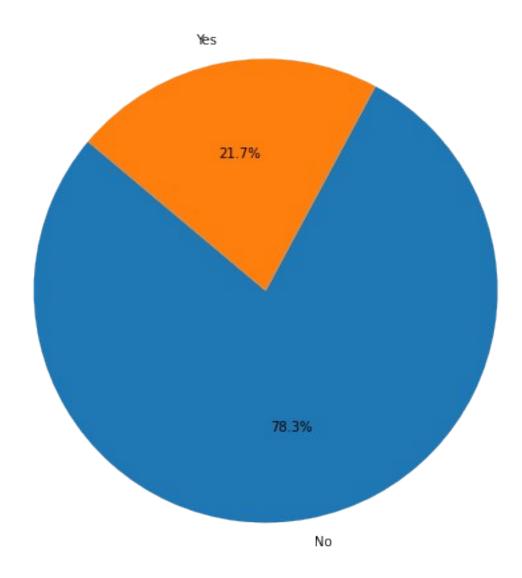
```
data_of_no_continue_MBcardcounts=data_of_no_continue['MembershipCard']
.value_counts()
data_of_no_continue_MBcardcounts

MembershipCard
No     18
Yes     5
Name: count, dtype: int64

plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_MBcardcounts,
labels=data_of_no_continue_MBcardcounts.index, autopct='%1.1f%%',
startangle=140)
```

```
plt.title('Percentage of the people not continue Buying with
Membership Cards')
plt.show()
```

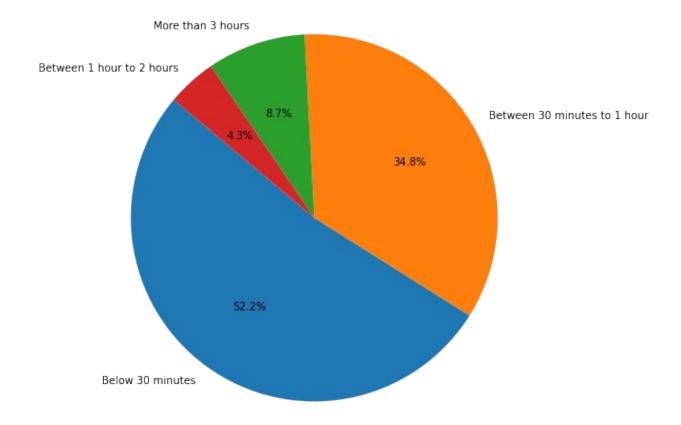
Percentage of the people not continue Buying with Membership Cards



Creating visualizations to illustrate the influence of the duration spent inside the coffeeshop on purchasing behavior

```
Duration
Below 30 minutes
                                12
Between 30 minutes to 1 hour
                                 8
                                 2
More than 3 hours
                                 1
Between 1 hour to 2 hours
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_durationcounts,
labels=data_of_no_continue_durationcounts.index, autopct='%1.1f%',
startangle=140)
plt.title('Percentage of the duration spent inside the coffeeshop for
people not continue Buying' )
plt.show()
```

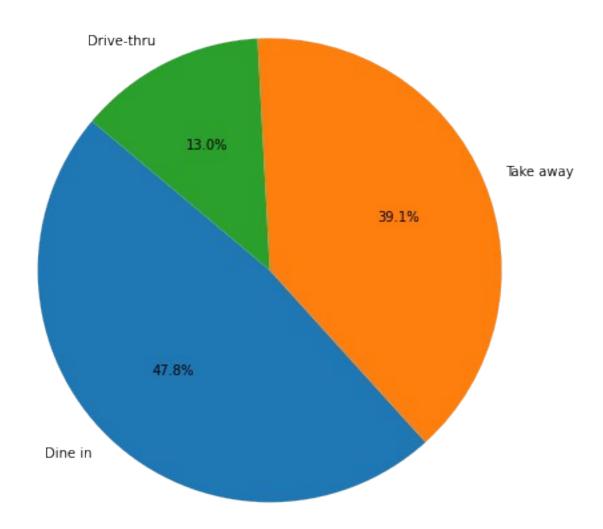
Percentage of the duration spent inside the coffeeshop for people not continue Buying



Creating visualizations to illustrate the influence of the ways of enjoyment their coffee on purchasing behavior

```
data of no continue Enjoymentcounts=data of no continue['Enjoyment'].v
alue counts()
data_of_no_continue_Enjoymentcounts
Enjoyment
Dine in
              11
               9
Take away
Drive-thru
               3
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_Enjoymentcounts,
labels=data_of_no_continue_Enjoymentcounts.index, autopct='%1.1f%%',
startangle=\overline{140}
plt.title('Percentage of the ways of enjoyment for people not continue
Buying')
plt.show()
```

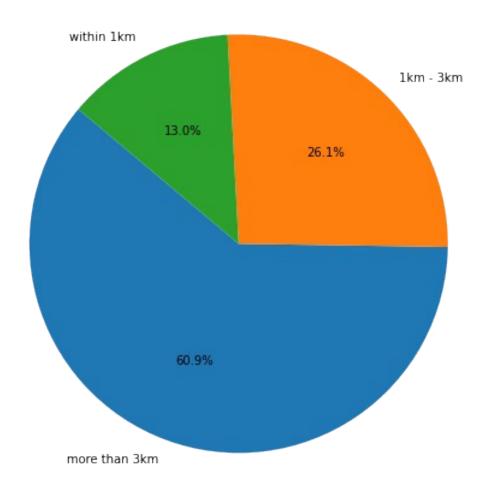
Percentage of the ways of enjoyment for people not continue Buying



Creating visualizations to illustrate the influence of the distance needed to travel on purchasing behavior

```
plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_Distancecounts,
  labels=data_of_no_continue_Distancecounts.index, autopct='%1.1f%%',
  startangle=140)
plt.title('Percentage of the distance away from the coffeshop for
  people not continue Buying')
plt.show()
```

Percentage of the distance away from the coffeshop for people not continue Buying



```
threekmdisData = data[(data['Distance'] == 'more than 3km')]
threekmdisData

Timestamp Gender Age
Current \
2   2019/10/01 12:38:56 PM GMT+8 Male From 20 to 29
Employed
```

3 2019/10/01 12:39:08 PM	GMT+8 Fema	ale From 20 to	29
Student	CMT 0 5	1 5 20 1	20
5 2019/10/01 12:39:39 PM	GMI+8 Fema	ale From 20 to	29
Student 7 2019/10/01 12:40:58 PM	CMT LO M	ale From 20 to	20
Employed	UN1+0 M	ate From 20 to	29
8 2019/10/01 12:42:27 PM	GMT+8 Fem:	ale From 20 to	29
Student	diff of telling	JCC 110111 20 CO	23
9 2019/10/01 12:43:36 PM	GMT+8 Ma	ale From 20 to	29
Employed			
10 2019/10/01 12:47:00 PM	GMT+8 Fema	ale From 20 to	29
Student			
11 2019/10/01 12:48:26 PM	GMT+8 Fema	ale From 20 to	29
Student			
15 2019/10/01 12:57:31 PM	GMT+8 Fema	ale From 20 to	29
Employed	CMT O M	-1 - 40 and aba	va Calf
24 2019/10/01 1:24:21 PM	GM1+8 M	ale 40 and abo	ve Sett-
employed 27 2019/10/01 1:33:54 PM	GMT±8 M:	ala From 20 to	20 Solf-
employed	GITT+O IT	ate IIom 20 to	29 Jett-
30 2019/10/01 1:39:16 PM	GMT+8 Fema	ale From 20 to	29
Employed			
32 2019/10/01 1:45:12 PM	GMT+8 Fema	ale From 30 to	39
Employed			
35 2019/10/01 1:51:56 PM	GMT+8 Fema	ale From 20 to	29
Student			
37 2019/10/01 1:55:52 PM	GMT+8 Ma	ale Below	20
Student	CMT O M	.l. F 20 t.	20
38 2019/10/01 1:57:01 PM	GM1+8 M	ale From 20 to	29
Employed 43 2019/10/01 2:35:40 PM	CMT LO Fom:	alo Erom 20 +o	20
Employed	GITT-O TEIII	ate IIOIII 20 to	29
47 2019/10/01 2:42:02 PM	GMT+8 Fema	ale From 20 to	29 Self-
employed	Citi C	20 110 20 00	25 5011
50 2019/10/01 3:12:11 PM	GMT+8 Ma	ale 40 and abo	ve
Employed			
51 2019/10/01 3:16:32 PM	GMT+8 Fema	ale Below	20
Student			
52 2019/10/01 3:20:55 PM	GMT+8 Fema	ale 40 and abo	ve
Housewife	CMT . O Fam.	ala Dala	20
53 2019/10/01 3:21:16 PM	GMI+8 Fema	ale Below	20
Student 57 2019/10/01 4:03:57 PM	CMT_Q M	ale Below	20
Student 2019/10/01 4:03:37 FM	OTT TO PIC	ate betow	20
59 2019/10/01 6:19:46 PM	GMT+8 Fem:	ale From 20 to	29
Student	5.11.5 TOM	2.10 1.10111 20 00	_ •
62 2019/10/02 9:29:28 AM	GMT+8 Ma	ale From 30 to	39
Student			
64 2019/10/02 7:15:13 PM	GMT+8 Fema	ale From 20 to	29

Employed 68 2019/10/02 7:29:	52 DM (^MT . O	Eomalo	Erom	20 +0	20	
Employed	33 PN 0	JI'I +0	remate	FT OIII	20 10	29	
72 2019/10/02 8:08:	37 PM 0	GMT+8	Female	From	20 to	29	
Employed 74 2019/10/02 8:31:	21 PM 0	GMT+8	Female	From	20 to	29	
Housewife							
75 2019/10/02 8:35: Employed	08 PM 0	GMT+8	Male	From	20 to	29	
77 2019/10/02 9:19:	50 PM 0	GMT+8	Male	From	20 to	29	
Employed 70 /10 /03 7.10.	26 AM (°MT . O	Fomolo.	- From	20 +0	20	
78 2019/10/03 7:19: Student	30 AM 0	8+ ו ויונ	Female	From	20 to	29	
79 2019/10/03 7:21:	08 AM 6	GMT+8	Female		Below	20	
Student 82 2019/10/03 11:14:	37 AM (CMT_Q	Male	From	20 to	20	Self-
employed	J/ All C	3111 +0	nace	1 1 0111	20 10	29	36(1-
84 2019/10/03 11:15:	13 AM (GMT+8	Male	From	20 to	29	
Employed 85 2019/10/03 11:17:	27 AM (CMT_LQ	Male	From	30 to	30	Self-
employed	Z/ All C	3111 +0	nace	1 1 0111	30 10	29	36(1-
86 2019/10/03 11:18:	48 AM (GMT+8	Male	From	20 to	29	Self-
employed 90 2019/10/03 12:12:	22 PM (GMT+8	Female	From	30 to	39	
Employed	22 111 (3111 10	T CIII C C	1 1 0	30 10	33	
93 2019/10/03 2:13:	11 PM (GMT+8	Female	From	20 to	29	
Employed 94 2019/10/03 2:34:	09 PM (GMT+8	Male	From	20 to	29	
Employed							
96 2019/10/03 3:44: employed	13 PM (GMT+8	Female	From	20 to	29	Self-
99 2019/10/03 5:19:	31 PM 0	GMT+8	Male	From	30 to	39	
Employed				_			
100 2019/10/03 6:24: Student	46 PM (GMT+8	Male	From	20 to	29	
101 2019/10/03 6:31:	44 PM (GMT+8	Male	From	20 to	29	
Student	21 DM (CMT O		_	20 1	20	C 1.6
102 2019/10/03 6:35: employed	21 PM (8+۱۱اد	Male	From	20 to	29	Self-
103 2019/10/03 6:41:	20 PM 0	GMT+8	Male	From	30 to	39	
Employed	10 DM (CMT. O	M-1-		D = 1 =	20	
104 2019/10/03 6:44: Student	10 PM (8+ ۱ ا∖اد	Male		Below	20	
105 2019/10/03 6:45:	28 PM (GMT+8	Male	40 a	ind abo	ove	
Employed	52 DM (CMT + O	Mala	Erom	20 +2	20	
106 2019/10/03 6:46: Student	JO PIN C	ס+ ו ויונ	Male	L I OIII	20 to	29	
109 2019/10/03 7:40:	31 PM (GMT+8	Male	From	20 to	29	
Student							

110 20 Student	019/10	9/03	7:43:00) PM	GMT+8	Male	From	20 t	o 29			
111 20	-	9/03	7:47:00) PM	GMT+8	Female	From	20 t	o 29			
Employed		9/03	8:58:26	5 PM	GMT+8	Female		Belo	w 20			
Student 114 20	019/10	9/03	9:25:36	5 PM	GMT+8	Male	40 a	and a	bove	Se	elf-	
employed		/03 1	0:38:42	2 PM	GMT+8	Male		Belo	w 20			
Student						Male						
Student	13, 10,	05 1	1.24.3	, , , , ,	GIII 10	riacc	1 1 0111	J0 C	0 33			
D	. \		Inco	me	Visits	Enjo	yment					
Duration 2 1 hour	-	than	RM25,0	000	Monthly	, Di	ne in	Bet	ween	30	minutes	to
3 minutes	Less	than	RM25,0	000	Rarely	' Take	away				Below	30
5	Less	than	RM25,0	000	Rarely	, Di	ne in	Bet	ween	30	minutes	to
	M50,00	90 -	RM100,0	000	Rarely	, Di	ne in	Bet	ween	30	minutes	to
1 hour 8	Less	than	RM25,0	000	Rarely	, Drive	-thru				Below	30
minutes 9	Less	than	RM25,0	000	Monthly	, Take	away				Below	30
minutes 10	Less	than	RM25,0	000	Rarely	, Di	ne in				Below	30
minutes 11			RM25,0		-	, Di		R _O +	waan	30	minutes	
1 hour			-		-							
15 1 hour	Less	than	RM25,0	000	Rarely	' Take	away	Bet	ween	30	minutes	to
24 RM: 2 hours	100,00	90 -	RM150,0	000	Rarely	, Di	ne in		Betw	een	1 hour	to
27 minutes	Less	than	RM25,0	000	Monthly	' Take	away				Below	30
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	RM25,0	900 -	RM50,0	000	Rarely	, Take	away				Below	30
minutes 35	Less	than	RM25,0	000	Rarely	, Take	away				Below	30
minutes 37	Less	than	RM25,0	00	Rarely	, Di	ne in		Betw	een	1 hour	to
2 hours 38			RM25,0		Rarely		away				Below	
minutes 43					Monthly						Below	
minutes	LESS	tiidii	RM25,0	000	riontinty	iake	away				DETOM	20

47 Less than RM25,000	Rarely	Take away	Between 30 minutes to
1 hour 50 RM100,000 - RM150,000	Rarely	Dine in	Below 30
minutes 51 Less than RM25,000	Paroly	Dino in	Below 30
minutes	Nately	Dine in	below 30
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Less than RM25,000	Rarely	Drive-thru	Below 30
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1 hour	Horrency	DINC III	Between 30 minutes to
59 Less than RM25,000	Rarely	Drive-thru	Below 30
minutes 62 Less than RM25,000	Rarelv	Dine in	Between 30 minutes to
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64 Less than RM25,000	Rarely	Take away	Below 30
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72 Less than RM25,000	Monthly	Take away	Below 30
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1 hour			
78 Less than RM25,000 minutes	Rarely	Take away	Below 30
79 Less than RM25,000	Rarely	Take away	Below 30
minutes		5	
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84 RM25,000 - RM50,000	Rarely	Dine in	Between 1 hour to
2 hours	Marada I. I.	Dian in	D. L
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86 More than RM150,000	Rarely	Drive-thru	Between 30 minutes to
1 hour 90 RM50,000 - RM100,000	Wookly	Dino in	Between 1 hour to
2 hours	weekty	DINE III	between 1 nour to
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1 hour 102 RM50,000 - RM100,000 Daily Drive-thru Below 30 minutes 103 RM25,000 - RM50,000 Weekly Dine in Between 1 hour to 2 hours 104 Less than RM25,000 Rarely Drive-thru Between 30 minutes to 1 hour 105 RM50,000 - RM100,000 Monthly Drive-thru Between 30 minutes to 1 hour 106 Less than RM25,000 Rarely Take away Below 30 minutes 109 Less than RM25,000 Rarely Take away Below 30 minutes 110 Less than RM25,000 Monthly Take away Below 30 minutes 111 Less than RM25,000 Monthly Take away Below 30 minutes 112 Less than RM25,000 Rarely Take away Below 30 minutes 113 Less than RM25,000 Rarely Take away Below 30 minutes 114 RM25,000 - RM50,000 Rarely Dine in Between 30 minutes to 1 hour 115 Less than RM25,000 Monthly Take away Below 30 minutes 116 Less than RM25,000 Monthly Dine in Between 1 hour to 2 hours Distance MembershipCard SpendingLimit Quality \ 2 more than 3km Yes Less than RM20 4 3 more than 3km Yes Less than RM20 4 7 more than 3km Yes Less than RM20 4 7 more than 3km Yes More than RM20 4 8 more than 3km No Less than RM20 4 10 more than 3km No Less than RM20 4 10 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 12 more than 3km No Less than RM20 4 12 more than 3km No Less than RM20 4 12 more than 3km No Less than RM20 4 12 more than 3km No Less than RM20 4 12 more than 3km No Less than RM20 4 13 more than 3km No Less than RM20 4 14 more than 3km No Less than RM20 4 15 more than 3km No Less than RM20 4 15 more than 3km No Less than RM20 5 15 more than 3km No Less than RM20 5 15 more than 3km No Less than RM20 6 15 more than 3km No Less than RM20 6 15 more than 3km No Less than RM20 6 15 more than 3km No Less than RM20 6 15 more than 3km No Less than RM20 6 15 more than 3km No Less than RM20 6 15 more than 3km No Less than RM20 6 15 mo		Less	than	RM25,000	Rarely	Dine	in	Betwee	n 30	minutes	to
minutes 103 RM25,000 - RM50,000 Weekly Dine in Between 1 hour to 2 hours 104 Less than RM25,000 Rarely Drive-thru Between 30 minutes to 1 hour 105 RM50,000 - RM100,000 Monthly Drive-thru Between 30 minutes to 1 hour 106 Less than RM25,000 Rarely Take away Below 30 minutes 109 Less than RM25,000 Rarely Dine in Below 30 minutes 110 Less than RM25,000 Rarely Take away Below 30 minutes 111 Less than RM25,000 Monthly Take away Below 30 minutes 111 Less than RM25,000 Rarely Take away Below 30 minutes 112 Less than RM25,000 Rarely Take away Below 30 minutes 113 Less than RM25,000 Rarely Take away Below 30 minutes 114 RM25,000 - RM50,000 Rarely Dine in Between 30 minutes to 1 hour 115 Less than RM25,000 Daily Take away Below 30 minutes 116 Less than RM25,000 Monthly Dine in Between 1 hour to 2 hours Distance MembershipCard SpendingLimit Quality \ 2 more than 3km Yes Less than RM20 4 3 more than 3km No Less than RM20 4 7 more than 3km Yes Less than RM20 4 8 more than 3km Yes More than RM40 5 9 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 4 11 more than 3km No Less than RM20 3 15 more than 3km No Less than RM20 4 10 more than 3km No Less than RM20 3 15 more than 3km Yes Less than RM20 4 17 more than 3km No Less than RM20 4 18 more than 3km No Less than RM20 4 19 more than 3km No Around RM20 - RM40 4 10 more than 3km No Around RM20 - RM40 4 11 more than 3km No Around RM20 - RM40 5 13 more than 3km No Less than RM20 4 14 more than 3km No Around RM20 - RM40 5 15 more than 3km No Less than RM20 4 17 more than 3km No Around RM20 - RM40 4 18 more than 3km No Less than RM20 4 19 more than 3km No Around RM20 - RM40 5 10 more than 3km No Less than RM20 6 11 more than 3km No Less than RM20 7 12 more than 3km No Less than RM20 8 13 more than 3km No Less than RM20 8 14 more than 3km No Less than RM20 8 15 more than 3km No Around RM20 - RM40 9 15 more than 3km No Less than RM20 8 16 more than 3km No Less than RM20 8 17 more than 3km No Less than RM20 8 18 more than 3km No				•	,						
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24 more than 3km No Around RM20 - RM40 4 27 more than 3km No Around RM20 - RM40 5 30 more than 3km Yes Around RM20 - RM40 3 32 more than 3km No Around RM20 - RM40 2 35 more than 3km No Less than RM20 4 37 more than 3km No Less than RM20 5 38 more than 3km Yes Around RM20 - RM40 4 43 more than 3km No Around RM20 - RM40 4											
27 more than 3km No Around RM20 - RM40 5 30 more than 3km Yes Around RM20 - RM40 3 32 more than 3km No Around RM20 - RM40 2 35 more than 3km No Less than RM20 4 37 more than 3km No Less than RM20 5 38 more than 3km Yes Around RM20 - RM40 4 43 more than 3km No Around RM20 - RM40 4											
32 more than 3km No Around RM20 - RM40 2 35 more than 3km No Less than RM20 4 37 more than 3km No Less than RM20 5 38 more than 3km Yes Around RM20 - RM40 4 43 more than 3km No Around RM20 - RM40 4						Λ					
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35more than 3kmNoLess than RM20437more than 3kmNoLess than RM20538more than 3kmYesAround RM20 - RM40443more than 3kmNoAround RM20 - RM404										2	
37 more than $3km$ No Less than RM20 5 38 more than $3km$ Yes Around RM20 - RM40 4 43 more than $3km$ No Around RM20 - RM40 4										4	
43 more than 3km No Around RM20 - RM40 4		re tha	an 3kı	m	No .					5	
4/ more than 3km No Zero 3						Arou	ınd RM				
	4/ mo	re tha	an 3ki	m	NO .			Ζ	ero	3	

50 51 52 53 57 59 62 64 68 72 74 75 77 78 79 82 84 85 86 99 100 101 103 104 105 106 110 111 111 113	more than more t	3km 3km 3km 3km 3km 3km 3km 3km	Yes No Yes No No No No No No Yes No Yes Yes Yes Yes Yes Yes Yes No No No No No No No Yes Yes Yes Yes Yes Yes Yes Yes No No No No No No No No No No No No No		Around RM20 - Less than More than Around RM20 - Less than Less than Less than Around RM20 - More than Around RM20 - Less than Less than Less than Around RM20 - Less than Less than Less than	RM20 RM40 RM20 RM20 RM40 Zero Zero RM20 RM20 RM20 RM20 RM20 RM40 RM40 RM40 RM40 RM40 RM40 RM20 RM40 RM20 RM40 RM20 RM40 RM20 RM20 RM40 RM20 RM20 RM40 RM20 RM20 RM40 RM20 RM20 RM20 RM20 RM20 RM20 RM20 RM2	4 3 5 3 5 4 3 3 4 4 4 4 4 5 3 3 4 4 4 4
111 113 114 115 116	more than more than more than more than more than	3km 3km 3km	No No No No		Less than Less than Less than Around RM20 - Less than	RM20 RM20 RM40	5 3 2 5 4
		e PromotionImp	ortand	ce Ar	mbiance WifiQu	uality	
Serv.	-	3		4	4	4	4
3		1		4	3	3	3
5	5	3		5	5	4	5
7		2		3	3	3	3
8		4		4	4	4	4
O	2	+		4	4	4	4

9	3	3	4	3	3
10	1	4	5	3	3
11	2	4	4	3	4
15	1	5	4	3	4
24	3	4	4	3	3
27	3	4	4	3	4
30	1	4	4	3	4
32	3	5	5	3	5
35	2	4	4	3	4
37	2	3	4	4	3
38	4	4	4	4	4
43	4	5	4	4	5
47	1	5	4	3	3
50	4	4	4	2	3
51	3	2	2	2	4
52	4	3	5	3	5
53	3	2	3	3	3
57	5	5	5	5	5
59	3	4	4	3	4
62	3	4	3	3	3
64	1	5	3	4	4
68	1	5	4	4	4
72	2	4	4	3	4
74	2	3	3	3	5
75	3	4	5	4	4
77	2	1	4	1	4

78	1	5	2	2	2
79	2	3	2	2	2
82	5	5	5	5	5
84	2	4	3	4	4
85	3	4	4	3	4
86	3	2	3	1	2
90	4	5	4	4	5
93	3	5	5	4	4
94	1	3	3	1	3
96	3	1	4	3	4
99	2	3	4	4	4
100	2	3	3	3	3
101	4	3	3	1	2
102	2	4	4	3	3
103	5	5	4	4	3
104	4	4	4	4	4
105	3	5	4	4	4
106	3	3	3	3	3
109	3	3	3	3	3
110	2	3	5	4	4
111	4	4	4	4	4
113	4	5	5	5	4
114	2	1	2	2	3
115	5	5	5	5	5
116	4	5	4	2	3

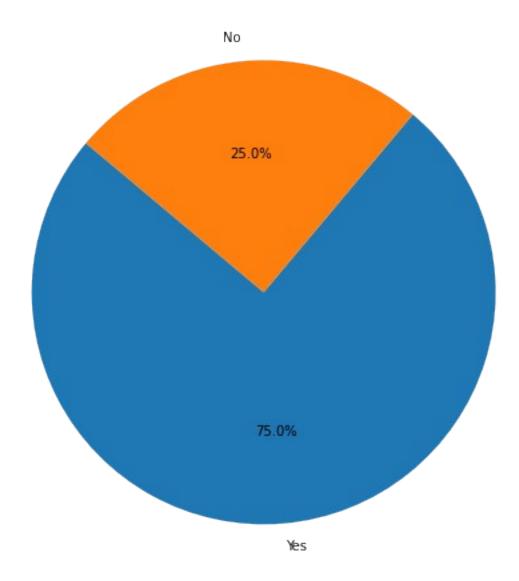
BussinessMeetine Advertiser \	gs	
2	3	In Store
displays;Billboards	_	
3 mouth	3	Through friends and word of
5	4	Social
Media		
<pre>7 Media; Emails; Thr</pre>	3	Starbucks Website/Apps;Social
8	4	Starbucks Website/Apps;Social Media;Through
fr		
9	4	Social Media;Through friends and word of
mouth 10	4	Social
Media	•	300141
11	4	Starbucks Website/Apps;Social Media;Through
fr 15	4	Starbucks
Website/Apps	4	Starbucks
24	5	Through friends and word of mouth; In Store
dis 27	3	Cocial
Media	3	Social
30	4	Starbucks Website/Apps;Social
Media; Emails; Thr	_	
32 Media	5	Social
35	1	Social
Media	_	
37 Media	5	Starbucks Website/Apps;Social
38	4	In Store
displays		
43	5	Starbucks Website/Apps;Social
<pre>Media; Emails; Bil</pre>	2	Social Media; Emails; Deal sites (fave,
iprice,		
50	4	Social Media;In Store
displays 51	3	Social Media;Through friends and word of
mouth	,	Social ficula, fill ough frichas and word of
52	5	Starbucks Website/Apps;Social Media;Deal
sites 53	3	Social
Media	5	Sociat
57	5	Through friends and word of
mouth	2	Ctarbucks Wahaita/Anna.Casi-1
59	3	Starbucks Website/Apps;Social

Media	_	
62 Media	3	Social
64	5	Social
Media	,	300141
68	1	Starbucks Website/Apps;Social Media;Through
fr		τ, μμα, από τη του τη
72	3	Through friends and word of
mouth		
74 Madia	4	Social
Media 75	4	Social Modia, Deal sites (favo inrico
etc)	4	Social Media;Deal sites (fave, iprice,
77	4	Social
Media	•	3334
78	2	Social Media; Through friends and word of
mouth		
79	2	Social Media;Deal sites (fave, iprice,
etc)	г	Chambualca
82 Website/Apps	5	Starbucks
84	4	In Store
displays	•	211 30310
85	4	Starbucks
Website/Apps;Emails		
86	2	Social Media;Through friends and word of
mouth	4	
90 Emails	4	
93	1	Social Media;In Store
displays	-	Social Healty III Store
94	2	Social Media; Through friends and word of
mouth		
96	4	Social Media;Through friends and word of
mouth	1	Casial
99 Media	4	Social
100	3	Through friends and word of
mouth	,	Through Triends and word or
101	3	Through friends and word of
mouth		•
102	3	Social
Media; Emails	_	Charles to Mahaita (Assa Casial Madia Tharash
103 fr	3	Starbucks Website/Apps;Social Media;Through
104	4	Social
Media; Emails		300141
105	4	Starbucks
Website/Apps		
106	3	Starbucks Website/Apps;Social

Media		
109	2	Social
Media	2	500141
	2	C ' - 1
110	2	Social
Media		
111	4	Social Media; Through friends and word of
mouth		
113	4	Social
	4	3001a0
Media		
114	2	In Store
displays		
115	5	Social Media; Through friends and word of
mouth	J	Social ficata, fill bagin friends and word of
	4	C ' - 1
116	4	Social
Media		
ContinueBuyi	ina	
	res	
2		
3 5 7 8 9	No	
5	Yes	
7	res 💮	
8	res 💮	
9	res .	
	res	
11	No	
15	No	
24	res (
	res 💮	
	res	
	res	
35	No	
37	res 💮	
	Yes	
	res	
	res	
	res	
51	No	
52	res 💮	
	res 💮	
	res	
	res	
	Yes	
64	No	
68	No	
	res	
	res	
	res .	
	Yes	
78	No	

```
79
                No
82
               Yes
84
                No
85
               Yes
               Yes
86
90
               Yes
93
               Yes
94
               Yes
96
               Yes
99
               Yes
100
               Yes
               Yes
101
102
               Yes
103
               Yes
104
                No
105
               Yes
106
               Yes
109
                No
                No
110
111
               Yes
113
               Yes
114
                No
115
               Yes
116
               Yes
[56 rows x 21 columns]
threekmdisData Continuecounts =
threekmdisData['ContinueBuying'].value_counts()
threekmdisData Continuecounts
ContinueBuying
Yes
       42
No
       14
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(threekmdisData Continuecounts,
labels=threekmdisData_Continuecounts.index, autopct='%1.1f%%',
startangle=140)
plt.title('Percentage of the three km away in continue Buying')
plt.show()
```

Percentage of the three km away in continue Buying



Due to some feedback contributors listing multiple advertisers, resulting in one or more unique values for the same contributor, it is necessary to extract and analyze these unique values

Splitting the values in those rows and counting each unique value

```
Advertisers_counter = {}
```

The code iterates through each row, splits the values in the 'Values' column using split(';'), and counts each unique value

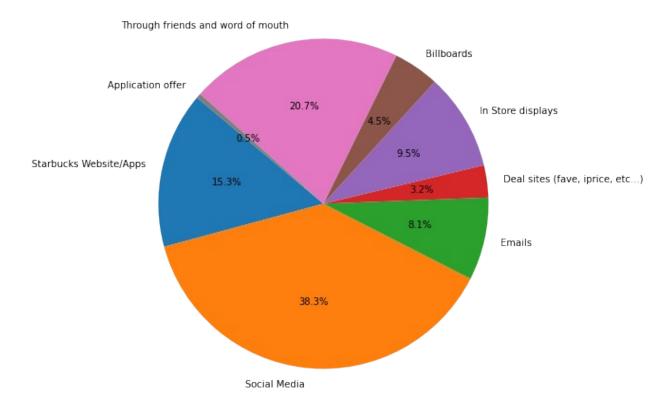
```
for index, row in data.iterrows():
   values_in_row = row['Advertiser'].split(';')
```

```
for value in values_in_row:
   if value not in Advertisers_counter:
      Advertisers_counter[value] = 1
   else:
      Advertisers_counter[value] += 1
```

Creating visualizations to illustrate the influence of the Advertiser on purchasing behavior

```
Advertisers counter data =
pd.DataFrame(list(Advertisers counter.items()),
columns=['UniqueValue', 'Count'])
Advertisers counter data
                         UniqueValue Count
0
              Starbucks Website/Apps
                                          34
                        Social Media
1
                                          85
                              Emails
                                          18
3
  Deal sites (fave, iprice, etc...)
                                          7
4
                   In Store displays
                                          21
5
                          Billboards
                                          10
6
  Through friends and word of mouth
                                          46
                   Application offer
                                          1
plt.figure(figsize=(8, 8))
plt.pie(Advertisers_counter_data['Count'],
labels=Advertisers counter data['UniqueValue'], autopct='%1.1f%',
startangle=140)
plt.title('The percentage of Advertisers')
plt.show()
```

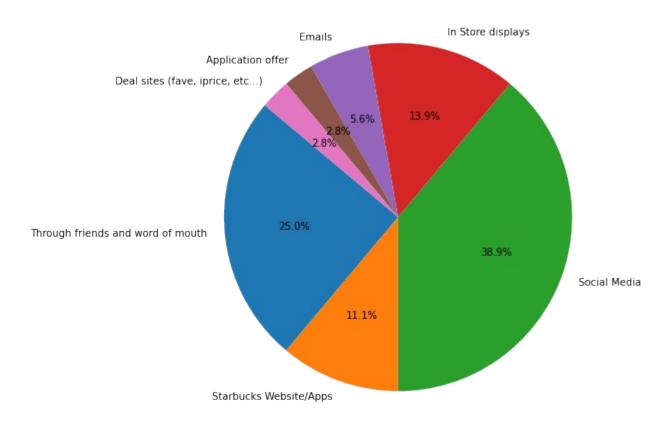
The percentage of Advertisers



```
Advertisers counter notbuying = {}
for index, row in data of no continue.iterrows():
    values in row = row['Advertiser'].split(';')
    for value in values in row:
        if value not in Advertisers counter notbuying:
            Advertisers counter notbuying[value] = 1
        else:
            Advertisers counter notbuying[value] += 1
Advertisers counter notbuying data =
pd.DataFrame(list(Advertisers counter notbuying.items()),
columns=['UniqueValue', 'Count'])
Advertisers counter notbuying data
                         UniqueValue Count
   Through friends and word of mouth
                                           9
1
              Starbucks Website/Apps
                                           4
2
                        Social Media
                                          14
3
                   In Store displays
                                           5
4
                              Emails
                                           2
5
                                           1
                   Application offer
  Deal sites (fave, iprice, etc...)
                                           1
```

```
plt.figure(figsize=(8, 8))
plt.pie(Advertisers_counter_notbuying_data['Count'],
labels=Advertisers_counter_notbuying_data['UniqueValue'],
autopct='%1.1f%%', startangle=140)
plt.title('The percentage of Advertisers in the not buying group')
plt.show()
```

The percentage of Advertisers in the not buying group



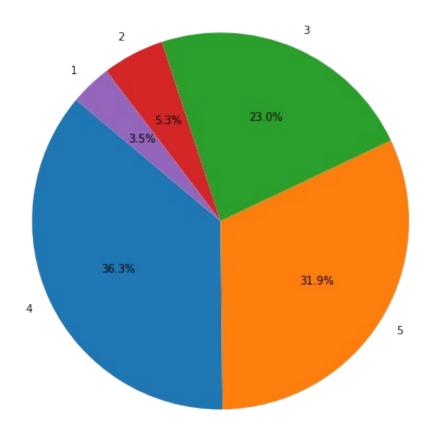
Creating visualizations to illustrate the rate on the importance of promotion on purchasing behavior

```
data_PromotionImportancecounts=data['PromotionImportance'].value_count
s()
data_PromotionImportancecounts

PromotionImportance
4    41
5    36
3    26
2    6
1    4
Name: count, dtype: int64
```

```
plt.figure(figsize=(8, 8))
plt.pie(data_PromotionImportancecounts,
labels=data_PromotionImportancecounts.index, autopct='%1.1f%%',
startangle=140)
plt.title('Percentage of the rates on the importance of promotion and
sales for the interviewed people')
plt.show()
```

Percentage of the rates on the importance of promotion and sales for the interviewed people

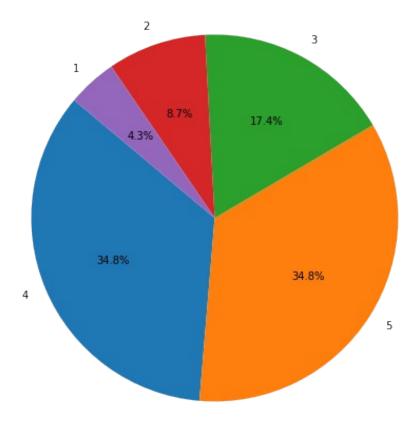


```
data_of_no_continue_PromotionImportancecounts=data_of_no_continue['Pro
motionImportance'].value_counts()
data_of_no_continue_PromotionImportancecounts

PromotionImportance
4     8
5     8
3     4
2     2
1     1
Name: count, dtype: int64
```

```
plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_PromotionImportancecounts,
labels=data_of_no_continue_PromotionImportancecounts.index,
autopct='%1.1f%%', startangle=140)
plt.title('Percentage of the rates on the importance of promotion and
sales for the not continuing buying')
plt.show()
```

Percentage of the rates on the importance of promotion and sales for the not continuing buying

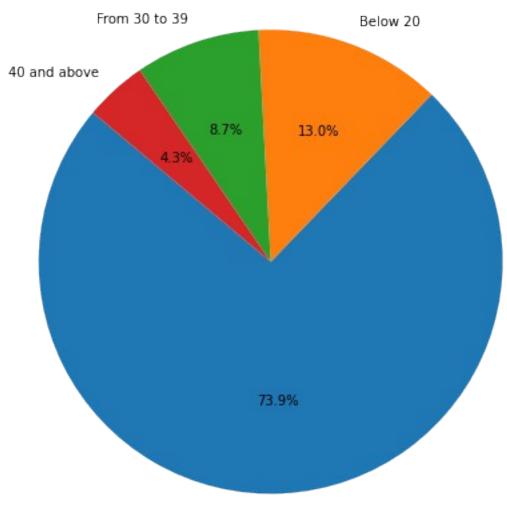


Creating visualizations to illustrate the different age groups influence on the purchasing behavior

```
40 and above 1
Name: count, dtype: int64

plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_Agecounts,
labels=data_of_no_continue_Agecounts.index, autopct='%1.1f%%',
startangle=140)
plt.title('Percentage of the age groups for people not continue
Buying')
plt.show()
```

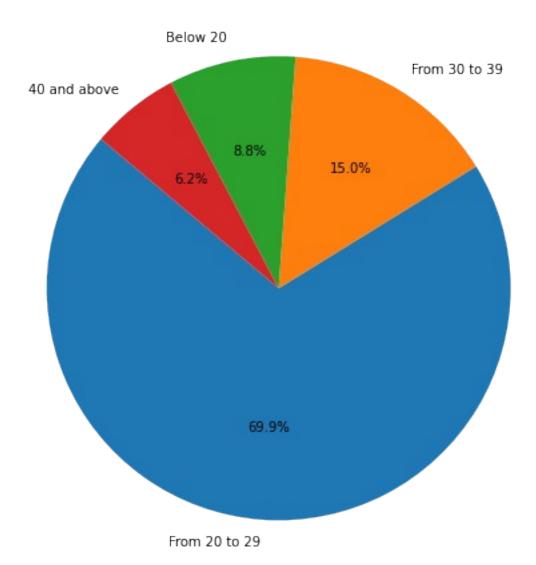
Percentage of the age groups for people not continue Buying



From 20 to 29

```
data_Agecounts=data['Age'].value_counts()
data_Agecounts
Age
From 20 to 29
                 79
From 30 to 39
                 17
Below 20
                 10
40 and above
                 7
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(data_Agecounts, labels=data_Agecounts.index, autopct='%1.1f%
%', startangle=140)
plt.title('Percentage of the age groups for all the interviewed')
plt.show()
```

Percentage of the age groups for all the interviewed



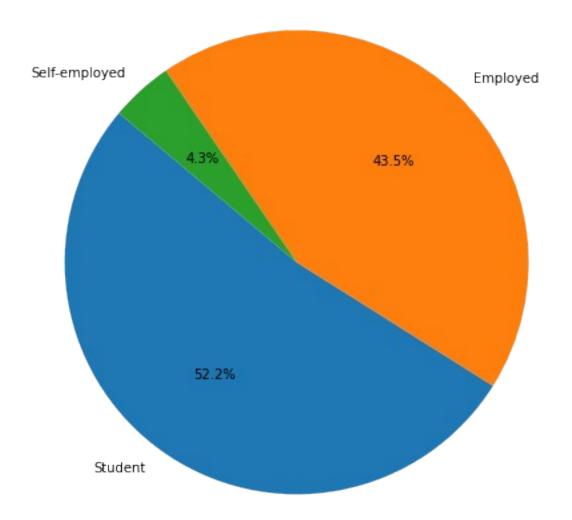
Creating visualizations to illustrate the influence of the current status on purchasing behavior

```
data_of_no_continue_Currentcounts=data_of_no_continue['Current'].value
_counts()
data_of_no_continue_Currentcounts

Current
Student 12
Employed 10
Self-employed 1
Name: count, dtype: int64
```

```
plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_Currentcounts,
labels=data_of_no_continue_Currentcounts.index, autopct='%1.1f%%',
startangle=140)
plt.title('Percentage of the current status for people not continue
Buying')
plt.show()
```

Percentage of the current status for people not continue Buying

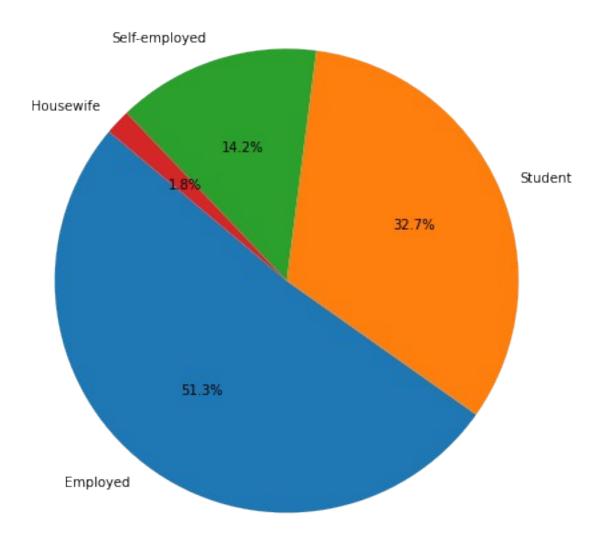


```
data_Currentcounts=data['Current'].value_counts()
data_Currentcounts
```

```
Current
Employed 58
Student 37
Self-employed 16
Housewife 2
Name: count, dtype: int64

plt.figure(figsize=(8, 8))
plt.pie(data_Currentcounts, labels=data_Currentcounts.index, autopct='%1.1f%%', startangle=140)
plt.title('Percentage of the current status for people interviewed')
plt.show()
```

Percentage of the current status for people interviewed



There are two big groups the Employed and the student

Creating visualizations to illustrate the influence of being a student on purchasing behavior

```
studentsData= data[data['Current'] == 'Student']
studentsData
                         Timestamp
                                    Gender
                                                       Age
                                                             Current
0
     2019/10/01 12:38:43 PM GMT+8
                                    Female
                                             From 20 to 29
                                                             Student
1
     2019/10/01 12:38:54 PM GMT+8
                                                            Student
                                    Female
                                             From 20 to 29
3
     2019/10/01 12:39:08 PM GMT+8
                                    Female
                                             From 20 to 29
                                                             Student
4
     2019/10/01 12:39:20 PM GMT+8
                                      Male
                                             From 20 to 29
                                                            Student
5
     2019/10/01 12:39:39 PM GMT+8
                                             From 20 to 29
                                    Female
                                                             Student
6
     2019/10/01 12:39:42 PM GMT+8
                                             From 20 to 29
                                    Female
                                                            Student
8
     2019/10/01 12:42:27 PM GMT+8
                                             From 20 to 29
                                    Female
                                                            Student
10
     2019/10/01 12:47:00 PM GMT+8
                                    Female
                                             From 20 to 29
                                                            Student
11
     2019/10/01 12:48:26 PM GMT+8
                                    Female
                                             From 20 to 29
                                                            Student
                                             From 20 to 29
12
     2019/10/01 12:49:25 PM GMT+8
                                    Female
                                                            Student
13
     2019/10/01 12:53:09 PM GMT+8
                                    Female
                                             From 20 to 29
                                                            Student
                                             From 20 to 29
14
     2019/10/01 12:53:16 PM GMT+8
                                    Female
                                                            Student
23
      2019/10/01 1:24:04 PM GMT+8
                                    Female
                                             From 20 to 29
                                                            Student
35
      2019/10/01 1:51:56 PM GMT+8
                                             From 20 to 29
                                                            Student
                                    Female
37
                                                  Below 20
      2019/10/01 1:55:52 PM GMT+8
                                      Male
                                                            Student
45
      2019/10/01 2:41:31 PM GMT+8
                                    Female
                                             From 30 to 39
                                                            Student
      2019/10/01 3:08:53 PM GMT+8
49
                                                  Below 20
                                                            Student
                                      Male
                                    Female
51
      2019/10/01 3:16:32 PM GMT+8
                                                  Below 20
                                                            Student
53
      2019/10/01 3:21:16 PM GMT+8
                                    Female
                                                  Below 20
                                                            Student
57
                                                  Below 20
      2019/10/01 4:03:57 PM GMT+8
                                      Male
                                                            Student
58
      2019/10/01 4:05:59 PM GMT+8
                                      Male
                                                  Below 20
                                                            Student
59
      2019/10/01 6:19:46 PM GMT+8
                                             From 20 to 29
                                    Female
                                                            Student
60
      2019/10/01 8:32:12 PM GMT+8
                                      Male
                                             From 20 to 29
                                                            Student
62
      2019/10/02 9:29:28 AM GMT+8
                                             From 30 to 39
                                                            Student
                                      Male
65
      2019/10/02 7:15:27 PM GMT+8
                                    Female
                                             From 20 to 29
                                                            Student
78
      2019/10/03 7:19:36 AM GMT+8
                                             From 20 to 29
                                                            Student
                                    Female
79
                                                  Below 20
                                                            Student
      2019/10/03 7:21:08 AM GMT+8
                                    Female
100
      2019/10/03 6:24:46 PM GMT+8
                                      Male
                                             From 20 to 29
                                                            Student
101
      2019/10/03 6:31:44 PM GMT+8
                                             From 20 to 29
                                                            Student
                                      Male
104
      2019/10/03 6:44:10 PM GMT+8
                                      Male
                                                  Below 20
                                                            Student
106
      2019/10/03 6:46:53 PM GMT+8
                                      Male
                                             From 20 to 29
                                                            Student
109
                                             From 20 to 29
      2019/10/03 7:40:31 PM GMT+8
                                      Male
                                                            Student
110
      2019/10/03 7:43:00 PM GMT+8
                                             From 20 to 29
                                                            Student
                                      Male
113
      2019/10/03 8:58:26 PM GMT+8
                                    Female
                                                  Below 20
                                                             Student
115
     2019/10/03 10:38:42 PM GMT+8
                                      Male
                                                  Below 20
                                                            Student
116
     2019/10/03 11:24:55 PM GMT+8
                                      Male
                                             From 30 to 39
                                                            Student
119
      2019/10/04 1:46:07 PM GMT+8
                                      Male
                                             From 20 to 29
                                                            Student
                             Visits
                                      Enjoyment
                    Income
Duration \
       Less than RM25,000
                             Rarely
                                        Dine in
                                                  Between 30 minutes to
1 hour
```

	s than	RM25,000	Rarely	Take away	Below 30
minutes 3 Les	s than	RM25.000	Rarelv	Take awav	Below 30
minutes					
	s than	RM25,000	Monthly	Take away	Between 30 minutes to
1 hour 5 Les	s than	RM25,000	Rarely	Dine in	Between 30 minutes to
1 hour		DMDE 000	D 1	Diamin	D-1 20
6 Les minutes	s tnan	RM25,000	Rarety	Dine in	Below 30
8 Les	s than	RM25,000	Rarely	Drive-thru	Below 30
minutes	_ 41	DM2E 000	Da	Dina in	D-1 20
10 Les minutes	s tnan	KM25,000	Rarety	Dine in	Below 30
11 Les	s than	RM25,000	Rarely	Dine in	Between 30 minutes to
1 hour					- 1 - 0
12 Les	s than	RM25,000	Weekly	Take away	Below 30
minutes 13 Les	s than	RM25,000	Rarelv	Take away	Below 30
minutes	5 chan	14123,000	narecy	ranc away	Be to 30
	s than	RM25,000	Rarely	Take away	Below 30
minutes	c than	DMOE 000	Man+hl.	Duive the	Datuman 1 hours to 2
23 Les	S Cliali	KM25,000	riolicity	Di ive-tili u	Between 1 hour to 2
	s than	RM25,000	Rarely	Take away	Below 30
minutes					
37 Les	s than	RM25,000	Rarely	Dine in	Between 1 hour to 2
hours 45 RM50,	000 -	RM100.000	Rarelv	Take away	Below 30
minutes		200,000	na. ety	ranc anay	201011 30
49 Les	s than	RM25,000	Rarely	Drive-thru	Below 30
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10	1	4	5	3	3
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13	3	4	4	4	4
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23	4	4	5	4	4
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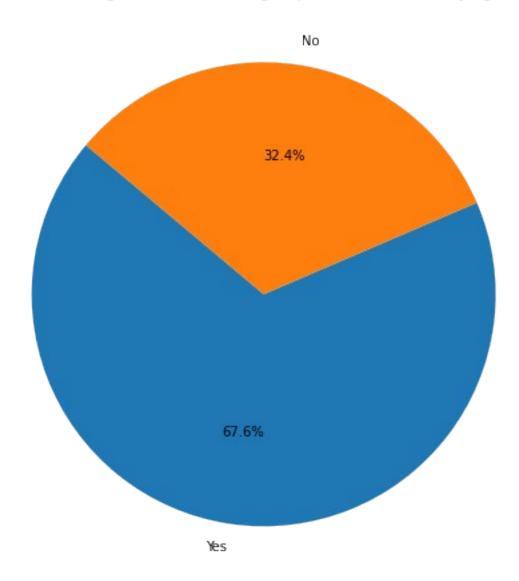
53	3		2	3	3	3
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58	3		3	3	4	3
59	3		4	4	3	4
60	1		5	1	4	3
62	3		4	3	3	3
65	3		2	4	3	4
78	1		5	2	2	2
79	2		3	2	2	2
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101	4		3	3	1	2
104	4		4	4	4	4
106	3		3	3	3	3
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Media 113	109	2	Social
Media 115	110	2	Social
115 5 Social Media; Through friends and word of mouth 116 4 Social Media 119 4 Social Media; Through friends and word of mouth ContinueBuying 0 Yes 1 Yes 3 No 4 Yes	113	4	Social
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109
                No
110
                No
113
               Yes
115
               Yes
116
               Yes
119
                No
[37 rows x 21 columns]
studentsData Continuecounts =
studentsData['ContinueBuying'].value counts()
studentsData Continuecounts
ContinueBuying
Yes
       25
       12
No
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(studentsData_Continuecounts,
labels=studentsData Continuecounts.index, autopct='%1.1f%',
startangle=140)
plt.title('Percentage of the Students group in the continue buying')
plt.show()
```

Percentage of the Students group in the continue buying



Creating visualizations to illustrate the influence of being an employed on purchasing behavior

<pre>employedData= data[data['Current'] == 'Employed'] employedData</pre>								
	Timestamp	Gender	Age	Current	\			
2	2019/10/01 12:38:56 PM GMT+8	Male From 20	to 29	Employed				
7	2019/10/01 12:40:58 PM GMT+8	Male From 20	to 29	Employed				
9	2019/10/01 12:43:36 PM GMT+8	Male From 20	to 29	Employed				
15	2019/10/01 12:57:31 PM GMT+8	Female From 20	to 29	Employed				
16	2019/10/01 12:59:11 PM GMT+8	Male From 30	to 39	Employed				
17	2019/10/01 1:08:15 PM GMT+8	Male From 20	to 29	Employed				
18	2019/10/01 1:09:12 PM GMT+8	Male From 20	to 29	Employed				

```
20
      2019/10/01 1:13:45 PM GMT+8
                                       Male
                                             From 30 to 39
                                                             Employed
                                             From 20 to 29
21
      2019/10/01 1:14:43 PM GMT+8
                                     Female
                                                             Employed
22
      2019/10/01 1:21:50 PM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
25
      2019/10/01 1:25:56 PM GMT+8
                                       Male
                                             From 30 to 39
                                                             Employed
26
      2019/10/01 1:29:11 PM GMT+8
                                       Male
                                             From 30 to 39
                                                             Employed
29
      2019/10/01 1:37:27 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
30
      2019/10/01 1:39:16 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
31
      2019/10/01 1:40:23 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
32
      2019/10/01 1:45:12 PM GMT+8
                                             From 30 to 39
                                     Female
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33
      2019/10/01 1:45:43 PM GMT+8
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      2019/10/01 1:51:47
                                             From 20 to 29
34
                          PM GMT+8
                                     Female
                                                             Employed
38
      2019/10/01 1:57:01 PM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
39
      2019/10/01 2:00:32 PM GMT+8
                                             From 30 to 39
                                       Male
                                                             Employed
41
      2019/10/01 2:06:24 PM GMT+8
                                             From 20 to 29
                                       Male
                                                             Employed
42
      2019/10/01 2:27:41 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
43
      2019/10/01 2:35:40
                          PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
48
      2019/10/01 2:45:52 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
50
                                              40 and above
      2019/10/01 3:12:11 PM GMT+8
                                       Male
                                                             Employed
54
      2019/10/01 3:57:29 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
55
      2019/10/01 4:02:35 PM GMT+8
                                             From 20 to 29
                                                             Employed
                                     Female
      2019/10/01 4:03:17 PM GMT+8
56
                                             From 20 to 29
                                                             Employed
                                     Female
                                             From 20 to 29
61
     2019/10/02 12:13:06 AM GMT+8
                                     Female
                                                             Employed
63
      2019/10/02 7:14:30 PM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
64
      2019/10/02 7:15:13 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
68
      2019/10/02 7:29:53
                          PM GMT+8
                                             From 20 to 29
                                                             Employed
                                     Female
69
      2019/10/02 7:31:32 PM GMT+8
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70
      2019/10/02 7:33:51 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
71
      2019/10/02 8:04:41 PM GMT+8
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                                             From 20 to 29
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72
      2019/10/02 8:08:37 PM GMT+8
                                             From 20 to 29
                                     Female
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73
      2019/10/02 8:29:35 PM GMT+8
                                       Male
                                             From 30 to 39
                                                             Employed
75
      2019/10/02 8:35:08 PM GMT+8
                                             From 20 to 29
                                       Male
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76
      2019/10/02 8:52:13 PM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
77
      2019/10/02 9:19:50 PM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
80
                                             From 20 to 29
      2019/10/03 8:46:25 AM GMT+8
                                     Female
                                                             Employed
84
     2019/10/03 11:15:13 AM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
87
     2019/10/03 11:22:03 AM GMT+8
                                     Female
                                             From 20 to 29
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88
     2019/10/03 11:25:13 AM GMT+8
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90
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91
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93
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                                     Female
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94
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                                                             Employed
95
                                             From 20 to 29
      2019/10/03 3:11:13 PM GMT+8
                                     Female
                                                             Employed
97
      2019/10/03 4:25:38 PM GMT+8
                                     Female
                                             From 30 to 39
                                                             Employed
98
      2019/10/03 4:41:10 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
99
                                                             Employed
      2019/10/03 5:19:31 PM GMT+8
                                       Male
                                             From 30 to 39
103
      2019/10/03 6:41:20
                          PM GMT+8
                                       Male
                                             From 30 to 39
                                                             Employed
105
      2019/10/03 6:45:28 PM GMT+8
                                       Male
                                              40 and above
                                                             Employed
111
      2019/10/03 7:47:00 PM GMT+8
                                     Female
                                             From 20 to 29
                                                             Employed
118
      2019/10/04 9:30:09 AM GMT+8
                                       Male
                                             From 20 to 29
                                                             Employed
```

120 121	2019/10/05 11:01:14 AM 2019/10/05 4:57:22 PM		le From 20 to 29 Employed le From 20 to 29 Employed
	Income Less than RM25,000 RM50,000 - RM100,000 Less than RM25,000 RM50,000 - RM100,000 Less than RM25,000 RM50,000 - RM100,000 Less than RM25,000 RM25,000 - RM50,000 RM100,000 - RM150,000 Less than RM25,000 RM25,000 - RM50,000 More than RM150,000 More than RM150,000 RM50,000 - RM100,000 RM50,000 - RM50,000 RM50,000 - RM50,000 RM50,000 - RM50,000 RM50,000 - RM50,000 RM25,000 - RM50,000	GMT+8 Marvisits Monthly Rarely Monthly Rarely Monthly Rarely Weekly Rarely Rarely Rarely Rarely Monthly Rarely	Enjoyment \ Dine in Dine in Take away Take away Drive-thru Dine in Take away Dine in Dine in Dine in Drive-thru Dine in Take away Drive-thru Take away Drive-thru Take away Drive-thru
33	•	Rarely Rarely Rarely Rarely Monthly Weekly Monthly Rarely Rarely Rarely Rarely Rarely Rarely Rarely Rarely Rarely	
68 69 70 71 72 73 75 76 77 80 84 87 88 90	RM25,000 - RM50,000 Less than RM25,000 RM25,000 - RM50,000 Less than RM25,000 Less than RM25,000 RM25,000 - RM50,000 Less than RM25,000 RM50,000 - RM100,000 RM50,000 - RM100,000 RM25,000 - RM50,000 Less than RM25,000 RM25,000 - RM50,000 RM25,000 - RM50,000 RM25,000 - RM50,000 RM25,000 - RM50,000	Rarely Rarely Rarely Weekly Monthly Rarely Rarely Monthly Monthly Rarely Rarely Rarely Rarely Rarely	Dine in Take away Take away Take away Take away Take away Take away Dine in Drive-thru Dine in Dine in Take away Dine in

91 93 94 95 97 98 99 103 105 111 118 120 121	Less than RM25,000 RM50,000 - RM100,000 RM25,000 - RM50,000 Less than RM25,000 RM25,000 - RM50,000 Less than RM25,000 RM25,000 - RM50,000 RM50,000 - RM100,000 Less than RM25,000	Monthly Rarely Monthly Rarely Rarely I dont Rarely Weekly Monthly Monthly Rarely Rarely	Take away Take away Take away Dine in like coffee Drive-thru Drive-thru Dine in Drive-thru Take away Dine in Take away Dine in		
Memb	Dur ershipCard \	ation Dista	ance		
2	Between 30 minutes to 1	hour more than	3km	Yes	
7	Between 30 minutes to 1	hour more than	3km	Yes	
9	Below 30 mi	nutes more than	3km	No	
15	Between 30 minutes to 1	hour more than	3km	Yes	
16	Below 30 mi	nutes within	1km	Yes	
17	Below 30 mi	nutes within	1km	Yes	
18	Below 30 mi	nutes 1km -	3km	Yes	
20	Below 30 mi	nutes within	1km	Yes	
21	Below 30 mi	nutes within	1km	No	
22	More than 3	hours within	1km	No	
25	Between 30 minutes to 1	hour 1km -	3km	Yes	
26	Below 30 mi	nutes 1km -	3km	No	
29	Between 30 minutes to 1	hour 1km -	3km	Yes	
30	Between 30 minutes to 1	hour more than	3km	Yes	
31	Below 30 mi	nutes within	1km	Yes	
32	Below 30 mi	nutes more than	3km	No	
33	Between 30 minutes to 1	hour 1km -	3km	Yes	
34	Below 30 mi	nutes within	1km	No	

38		Below 30 minutes	more than	3km	Yes	
39		Below 30 minutes	within	1km	Yes	
41	Between 30	minutes to 1 hour	within	1km	Yes	
42	Between 30	minutes to 1 hour	within	1km	Yes	
43		Below 30 minutes	more than	3km	No	
48		Below 30 minutes	within	1km	No	
50		Below 30 minutes	more than	3km	Yes	
54	Between 30	minutes to 1 hour	within	1km	Yes	
55	Between 30	minutes to 1 hour	1km -	3km	Yes	
56		Below 30 minutes	1km -	3km	No	
61		Below 30 minutes	1km -	3km	No	
63	Between 30	minutes to 1 hour	within	1km	Yes	
64		Below 30 minutes	more than	3km	No	
68		Below 30 minutes	more than	3km	No	
69	Between 30	minutes to 1 hour	1km -	3km	Yes	
70		Below 30 minutes	within	1km	No	
71	Between	1 hour to 2 hours	within	1km	Yes	
72		Below 30 minutes	more than	3km	Yes	
73		Below 30 minutes	1km -	3km	Yes	
75		Below 30 minutes	more than	3km	Yes	
76		Below 30 minutes	1km -	3km	No	
77	Between 30	minutes to 1 hour	more than	3km	Yes	
80		More than 3 hours	1km -	3km	Yes	
84	Between	1 hour to 2 hours	more than	3km	No	
87		Below 30 minutes	1km -	3km	Yes	
88		Below 30 minutes	within	1km	Yes	

90	Between 1 hour to 2	2 hours	more than	3km	Yes	
91	Between 30 minutes to	1 hour	within	1km	Yes	
93	Below 30 r				Yes	
94	Below 30 r			-	Yes	• • •
95	Between 30 minutes to	1 hour	1km -	3km	Yes	
97	Below 30 r	ninutes	within	1km	No	
98	Below 30 r	ninutes	1km -	3km	Yes	
99	Between 30 minutes to	1 hour	more than	3km	Yes	
103	Between 1 hour to 2	2 hours	more than	3km	No	
105	Between 30 minutes to	1 hour	more than	3km	No	
111	Below 30 r	minutes	more than	3km	No	
118	Between 1 hour to 2	2 hours	1km -	3km	Yes	
120	Below 30 r	minutes	within	1km	No	
121	Between 30 minutes to	1 hour	1km -	3km	No	
Ambi	SpendingLimit Qua ance \	ality P	riceRange	Promotionimpor	tance	
2	Less than RM20	4	3		4	
7	Less than RM20	4	2		3	
3 9	Around RM20 - RM40	4	3		3	
4 15	Less than RM20	4	1		5	
4			_			
16 4	Around RM20 - RM40	4	3		3	
17 4	Less than RM20	4	4		4	
18	Around RM20 - RM40	4	3		4	
5 20	Around RM20 - RM40	2	2		5	
3 21	Around RM20 - RM40	5	3		4	
3 22	Less than RM20	5	2		5	
		_				

5 25	Around RM20 - RM40	4	3	1
4	ATOUTH THIZO - THI T O		3	_
26	Less than RM20	4	2	4
4 29	Less than RM20	5	5	5
5 30	Around RM20 - RM40	3	1	4
4				
31 3	Around RM20 - RM40	4	3	3
32	Around RM20 - RM40	2	3	5
5				
33 3	Less than RM20	3	2	3
34	Less than RM20	3	4	4
3		_		
38 4	Around RM20 - RM40	4	4	4
39	Less than RM20	3	2	5
3	A DM20 DM40	-	4	-
41 5	Around RM20 - RM40	5	4	5
42	Around RM20 - RM40	5	4	5
5	Amound DM20 DM40	4	4	_
43 4	Around RM20 - RM40	4	4	5
48	Less than RM20	3	4	5
4 50	Around RM20 - RM40	4	4	4
4	ATOUTIU MIZO - MI4O	7	4	4
54	Around RM20 - RM40	4	3	5
4 55	Less than RM20	4	3	4
3	EC33 CHAIT MIZO	7	3	
56	Around RM20 - RM40	5	4	3
4 61	Around RM20 - RM40	5	4	3
4				
63 5	Less than RM20	4	2	3
64	Zero	3	1	5
3				_
68 4	Zero	2	1	5
69	Less than RM20	3	3	5
4	1 II DMD0	4	2	
70 5	Less than RM20	4	3	4
J				

71	Around RM20 -	RM40	5	1	3
3 72	Less than	RM20	4	2	4
4 73	Less than	RM20	3	2	4
4 75	Less than	DM20	3	3	4
5					
76 3	Less than	RM20	4	2	5
77 4	Around RM20 -	RM40	4	2	1
80	Around RM20 -	RM40	3	2	4
3 84	Around RM20 -	RM40	4	2	4
3 87	Around RM20 -	RM40	3	3	3
4 88	Around RM20 -	RM40	4	4	4
4					
90 4	Around RM20 -	RM40	4	4	5
91 5	Around RM20 -	RM40	4	3	4
93 5	Less than	RM20	5	3	5
94 3	Around RM20 -	RM40	3	1	3
95	Less than	RM20	3	3	5
4 97	Around RM20 -	RM40	3	3	3
3 98	Around RM20 -	RM40	4	3	4
3				2	
99 4	Less than		4	2	3
103 4	More than	RM40	4	5	5
105	Around RM20 -	RM40	4	3	5
4 111	Less than	RM20	5	4	4
4 118	More than	RM40	5	5	5
5 120	Less than	RM20	4	4	4
4					
121 4	Less than	KMZU	1	1	5

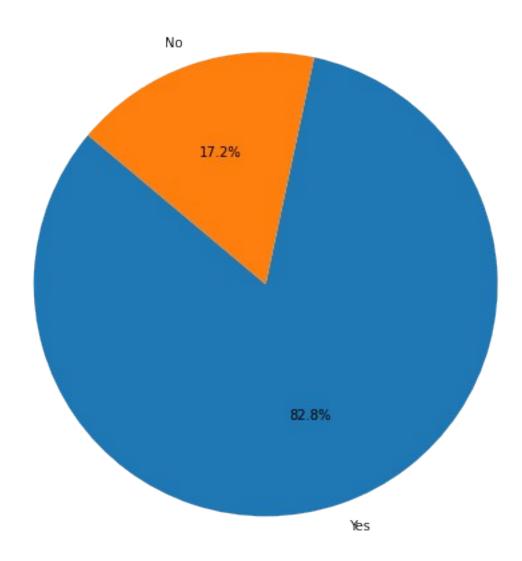
	WifiQuality	Service	BussinessMeetings	\
2 7	4	4	3	
9	3 3 3 3	3 3 4 3 4 5 4	3 4	
9 15	3	3 4	4	
16	3	3	3	
17	4	4	4	
18	5 3 3 2	5	3 4 5 3 5 3 4	
20	3		3	
21	3	4	5	
22 25	4	4	3	
26	4	5 4	2	
29	3	5	5	
30	3	4	5 4	
31	2	3	4	
32	3 3 2 3 3	5 4 3 5 4	5	
33			4 5 3 3 4	
34 38	4	4 4	3	
39	4	4 5	4 3	
41	3	5	5	
42	1	4	4	
43	4	5 5 4 5 4	3 5 4 5 2	
48	3	4	2	
50	2	3 5 3 3 4	4	
54 55	4 2	2	5 4	
56	2	3	1 3	
61	3	3	3	
63	4	4	5	
64	4	4	3 3 5 5 1	
68	4	4	1	
69	3	3	4	
70 71	5	5	3	
72	5 2 3 4	3 4	3	
73	4	5	4	
75	4	4	4	
76	2	4	4	
77	1	4	4	
77 80 84	1 4 3 4	3	3	
84 87	4	4	4	
88	3 A	3 Δ	3 1	
90	4	5	4	
90 91	5	4	5	
93 94	5 4	5 3 4 5 4 4 3 4 5 4 4 3 4 5 4	3 3 4 4 4 4 3 4 3 4 4 5 1 2	
94	1	3	2	

95 97 98 99 103 105 111 118 120 121		3 3 4 4 4 4 5 4 3	3 4 4 3 4 4 5 4 3		4 3 4 4 3 4 4 5 4		
						ContinueBuyi	
2			In Store	displays	;Billboards	Y	'es
7	Starbucks	Website/	Apps;Social	Media;Ema	ails;Thr	Y	'es
9	Social	Media;Th	rough frien	ds and wo	rd of mouth	Y	'es
15			St	arbucks We	ebsite/Apps		No
16				So	ocial Media	Y	'es
17	Social	Media;Th	rough frien	ds and wo	rd of mouth	Y	'es
18	Starbucks	Website/	Apps;Social	Media;Ema	ails;Thr	Y	'es
20				Social Me	edia;Emails		No
21				So	ocial Media	Y	'es
22		Th	rough frien	ds and wo	rd of mouth		No
25	S	ocial Med	ia;In Store	displays	;Billboards	Υ	'es
26				Applica	ation offer		No
29	Starbucks	Website/	Apps;Social	Media;Ema	ails;Thr	Y	'es
30	Starbucks	Website/	Apps;Social	Media;Ema	ails;Thr	Y	'es
31				In Sto	re displays	Y	'es
32				So	ocial Media	Y	'es
33				So	ocial Media		No
34	Social Me	dia;Throu	gh friends	and word	of mouth	Y	'es
38				In Sto	re displays	Υ	'es

39	Starbucks Website/Apps;Social Media	Yes
41	Starbucks Website/Apps;Social Media	Yes
42	Social Media	Yes
43	Starbucks Website/Apps;Social Media;Emails;Bil	Yes
48	Social Media;Through friends and word of mouth	Yes
50	Social Media;In Store displays	Yes
54	Social Media; Through friends and word of mouth	Yes
55	Starbucks Website/Apps	Yes
56	In Store displays	Yes
61	In Store displays	Yes
63	Social Media; Through friends and word of mouth	Yes
64	Social Media	No
68	Starbucks Website/Apps;Social Media;Through fr	No
69	Social Media; Through friends and word of mouth	Yes
70	Social Media; Through friends and word of mouth	Yes
71	Starbucks Website/Apps;Deal sites (fave, ipric	Yes
72	Through friends and word of mouth	Yes
73	Starbucks Website/Apps;Social Media	Yes
75	Social Media;Deal sites (fave, iprice, etc)	Yes
76	Social Media; Emails; Through friends and word o	Yes
77	Social Media	Yes
80	Starbucks Website/Apps	No
84	In Store displays	No
87	Social Media; Through friends and word of mouth	Yes
88	Starbucks Website/Apps;Social Media;Through fr	Yes
90	Emails	Yes

```
91
     Starbucks Website/Apps; Social Media; Emails; Thr...
                                                                    Yes
93
                         Social Media; In Store displays
                                                                    Yes
                                                                    Yes
94
        Social Media; Through friends and word of mouth
95
     Social Media; Through friends and word of mouth...
                                                                    Yes
97
                                           Social Media
                                                                    Yes
98
                                                                    Yes
                          Starbucks Website/Apps; Emails
99
                                           Social Media
                                                                    Yes
     Starbucks Website/Apps; Social Media; Through fr...
103
                                                                    Yes
105
                                 Starbucks Website/Apps
                                                                    Yes
     Social Media; Through friends and word of mouth...
                                                                    Yes
118
     Starbucks Website/Apps; Social Media; Emails; Dea...
                                                                    Yes
     Social Media; Through friends and word of mouth...
                                                                    Yes
120
121
                                                                     No
                                      In Store displays
[58 rows x 21 columns]
employedData Continuecounts =
employedData['ContinueBuying'].value_counts()
employedData Continuecounts
ContinueBuying
Yes
       48
No
       10
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(employedData Continuecounts,
labels=employedData Continuecounts.index, autopct='%1.1f%%',
startangle=140)
plt.title('Percentage of the employed group in continue Buying')
plt.show()
```

Percentage of the employed group in continue Buying



Creating visualizations to illustrate the influence of being a self-employed on purchasing behavior

<pre>selfempData= data[data['Current'] == 'Self-employed'] selfempData</pre>								
Timestamp	Gender Age							
Current \								
19 2019/10/01 1:13:03 PM GMT+8 employed	Female From 20 to 29 Self-							
24 2019/10/01 1:24:21 PM GMT+8 employed	Male 40 and above Self-							
27 2019/10/01 1:33:54 PM GMT+8	Male From 20 to 29 Self-							
. ,								

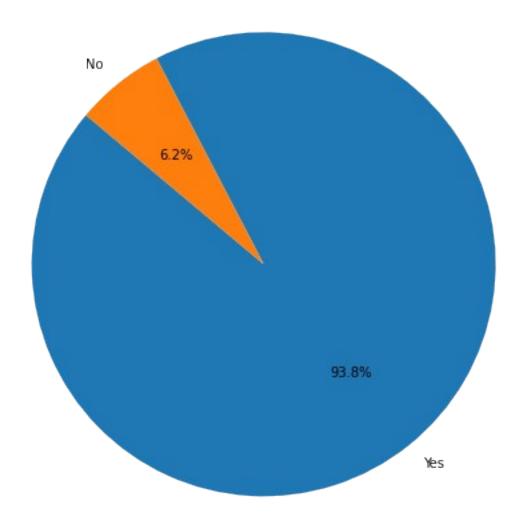
employe		1 1:34:30	ΡМ	GMT+8	Male	40 =	and	above	<u> </u>	elf-	
employe		1 1154150		011110	riace	40 0	arra	above	, ,	CCI	
		1 1:53:05	PM	GMT+8	Female	From	20	to 29	9 S	elf-	
employe		1 2:42:02	ΡМ	GMT+8	Female	From	20	to 29) S	elf-	
employe		1 2142102		GIII I O	T Cilia CC	1 1 0111	20	10 2.	, ,	CCI	
		2 7:23:55	PM	GMT+8	Female	From	20	to 29	9 S	elf-	
employe 82 20		11:14:37	٨м	CMT+O	Male	Erom	20	to 29) C	elf-	
employe		11:14:57	Al	GI11+0	Масе	L I OIII	20	10 2	9 3	eti-	
		11:14:44	AM	GMT+8	Male	From	30	to 39	9 S	elf-	
employe		11 17 27	A 1.4	CMT . O	M - 7 -	F	20	L - 20		-1.6	
85 20 employe		11:17:27	Αľ	GM1+8	Male	From	30	to 39	9 5	elf-	
		11:18:48	ΑМ	GMT+8	Male	From	20	to 29	9 S	elf-	
employe						_					
89 20 employe		11:32:03	AM	GMT+8	Male	From	20	to 29	9 S	elf-	
		3 3:44:13	PM	GMT+8	Female	From	20	to 29	9 S	elf-	
employe	ed										
		3 6:35:21	PM	GMT+8	Male	From	20	to 29	9 S	elf-	
employe		3 9:25:36	РМ	GMT+8	Male	40 8	and	above	<u> </u>	elf-	
employe		3 3123130	• • • •	0.11.0	riace	10 0	411 G	above	, ,	C C I	
117 20	19/10/04	12:24:26	AM	GMT+8	Male	40 a	and	above	e S	elf-	
employe	ed										
		Incor	ne	Visits	s Enjoy	ment					
Duratio	-			_						_	
	•	- RM100,00	90	Rarely	/ Take	away				Belov	w 30
minutes 24 RM		- RM150,00	90	Rarely	/ Dir	ne in		Betv	ween	1 hou	r to
2 hours	-				, , , ,						
		an RM25,00	90	Monthly	/ Take	away				Belov	w 30
minutes 28		n RM150,00	าด	Weekl.	/ Drive	thru				Belov	w 30
minutes		11 141130,00	50	Weekey	DITVE	ciii u				Deto	V 30
36		an RM25,00	90	Rarely	/ Take	away				Belov	w 30
minutes 47		an RM25,00	30	Rarely	, Tako	away	D.	1oor	. 30	minute	oc to
1 hour	LC33 CII	ali 11123,01	30	Naiety	, iake	away	DC	LWEEI	1 30	IIIIIIII	-5 LU
66		- RM50,00	90	Monthly	/ Dir	ne in				Belov	w 30
minutes		DM100 04	20	D1.	. D.:			D - ±.		1 6	
82 R 2 hours		- RM100,00	90	Rarely	/ Dir	ie in		Beti	ween	1 hou	το
		- RM100,00	90	Weekly	/ Take	away	Вє	etweer	า 30	minute	es to
1 hour		DM150 0	20	NA	5.			ь.		2 1	
85	More tha	n RM150,00	90	Monthly	/ Dir	ne in		Betwe	een	2 hours	5 to

_							
3 hours 86 More than RM150,000	O Rarely D	rive-thru Bet	ween 30 minu	ites to			
1 hour 89 RM25,000 - RM50,000	0 Rarely	Dine in	Bel	.ow 30			
minutes 96 Less than RM25,000	0 Rarely	Take away	Bel	.ow 30			
minutes 102 RM50,000 - RM100,000	O Daily D	rive-thru	Bel	.ow 30			
minutes 114 RM25,000 - RM50,000	0 Rarely	Dine in Bet	ween 30 minu	ites to			
1 hour 117 RM25,000 - RM50,000	0 Monthly	Dine in	Between 1 ho	our to			
2 hours							
Distance Members 19 1km - 3km 24 more than 3km 27 more than 3km 28 1km - 3km 36 within 1km 47 more than 3km 66 within 1km 82 more than 3km 83 1km - 3km 85 more than 3km 86 more than 3km 87 1km - 3km 88 more than 3km 89 1km - 3km 89 1km - 3km 89 1km - 3km 96 more than 3km 96 more than 3km 102 more than 3km 114 more than 3km 117 1km - 3km	Yes No Yes No No Yes	Less tha Around RM20	n RM20 - RM40 - RM40 n RM40 n RM20 Zero - RM40 n RM20 - RM40 n RM20 - RM40 n RM40 Zero n RM20 - RM40	ty \ 3 4 5 4 3 3 4 5 4 4 5 3 4 2 3			
Service \ 19 4	3	A	3	4			
24 3	4	4	3	3			
27 3	4	4	3	4			
28 5	3	3	3	4			
36 3	4	4	5	5			
47 1	5	4	3	3			
66 3	4	5	4	4			
82 5	5	5	5	5			

83	4			2	4		3	4
85	3			4	4		3	4
86	3			2	3		1	2
89	5			5	5		4	5
96	3			1	4		3	4
102	2			4	4		3	3
114	2			1	2		2	3
117	3			5	3		2	4
	essMeetin	gs						
19 Emails	`	2						
24		5	Through fr	iends	and wor	d of mouth	n;In Store	?
dis 27		3					Socia	ıl
Media 28		5	Starbucks \	Websit	e/Apps;	Social Med	lia;Throug	ıh
fr 36		2					Socia	ıl
Media 47		2	Social Med	ia•Ema	ils:Dea	al citoc (f		
iprice,							avc,	
66 Media;Emails	;Thr	4	Starbucks \	Websit	:e/Apps;	Social		
82 Website/Apps		5				Starbı	ıcks	
83		5					Socia	ıl
Media 85		4			Sta	arbucks		
Website/Apps 86	s;Emails	2	Social I	Media;	Through	n friends a	and word c	of
mouth 89		5		,	J.	Starbı		
Website/Apps	i	4	Social I	Modia	Through			· f
96 mouth			SUCTAL	neula;	iiii ougi	n friends a		7 1
102 Media;Emails	i	3				Soc	cial	
114 displays		2]	In Store	
117		4		St	arbucks	website/	Apps;Socia	ıl

```
Media
    ContinueBuying
19
               Yes
24
               Yes
27
               Yes
28
               Yes
36
               Yes
47
               Yes
66
               Yes
82
               Yes
83
               Yes
85
               Yes
86
               Yes
               Yes
89
96
               Yes
102
               Yes
114
                No
117
               Yes
[16 rows x 21 columns]
selfempData Continuecounts =
selfempData['ContinueBuying'].value_counts()
selfempData Continuecounts
ContinueBuying
Yes
       15
No
        1
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(selfempData Continuecounts,
labels=selfempData Continuecounts.index, autopct='%1.1f%',
startangle=140)
plt.title('Percentage of the Self-employed group in continue Buying')
plt.show()
```

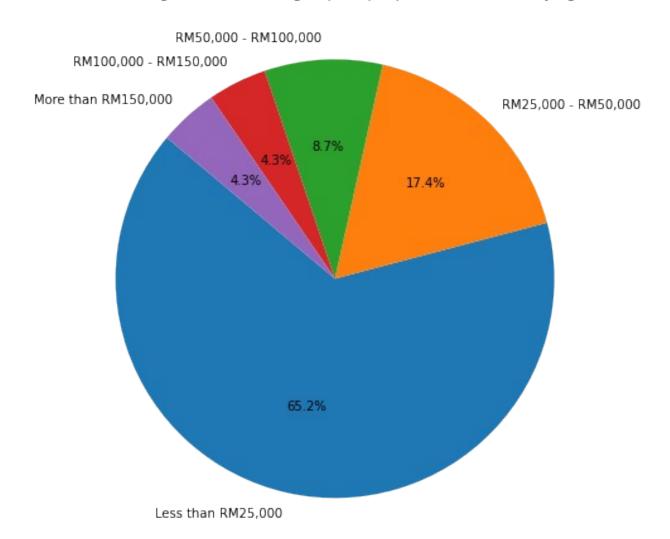
Percentage of the Self-employed group in continue Buying



Creating visualizations to illustrate the influence of income on purchasing behavior

```
plt.figure(figsize=(8, 8))
plt.pie(data_of_no_continue_Incomecounts,
labels=data_of_no_continue_Incomecounts.index, autopct='%1.1f%%',
startangle=140)
plt.title('Percentage of the income group for people not continue
Buying')
plt.show()
```

Percentage of the income group for people not continue Buying



```
LowmidincomeData = data[(data['Income'] == 'RM25,000 - RM50,000') |
(data['Income'] == 'Less than RM25,000')]
LowmidincomeData

Timestamp Gender Age
Current \
```

```
2019/10/01 12:38:43 PM GMT+8 Female From 20 to 29
Student
    2019/10/01 12:38:54 PM GMT+8 Female From 20 to 29
1
Student
    2019/10/01 12:38:56 PM GMT+8 Male From 20 to 29
Employed
    2019/10/01 12:39:08 PM GMT+8 Female From 20 to 29
Student
    2019/10/01 12:39:20 PM GMT+8
                                 Male From 20 to 29
Student
116 2019/10/03 11:24:55 PM GMT+8
                                 Male From 30 to 39
Student
117 2019/10/04 12:24:26 AM GMT+8 Male 40 and above Self-
employed
118
    2019/10/04 9:30:09 AM GMT+8 Male From 20 to 29
Employed
    2019/10/04 1:46:07 PM GMT+8 Male From 20 to 29
Student
120 2019/10/05 11:01:14 AM GMT+8 Female From 20 to 29
Employed
              Income Visits Enjoyment
Duration \
    Less than RM25,000 Rarely Dine in Between 30 minutes to 1
hour
     Less than RM25,000 Rarely Take away
                                                    Below 30
1
minutes
     Less than RM25,000
                       Monthly Dine in Between 30 minutes to 1
hour
3
     Less than RM25,000 Rarely Take away
                                                    Below 30
minutes
    Less than RM25,000
                       Monthly Take away Between 30 minutes to 1
hour
                       ...
. . .
116 Less than RM25,000
                       Monthly Dine in Between 1 hour to 2
hours
117 RM25,000 - RM50,000
                       Monthly Dine in Between 1 hour to 2
hours
118
    Less than RM25,000
                       Monthly Dine in Between 1 hour to 2
hours
119 Less than RM25,000 Rarely Dine in Between 30 minutes to 1
hour
120 Less than RM25,000 Rarely Take away
                                                    Below 30
minutes
        Distance MembershipCard ... SpendingLimit Quality \
```

0 1 2 3 4 116 117 118 119 120	within 1km - 3km more than 3km more than 3km - 3km more than 3km - 3km 1km - 3km 1km - 3km 1km - 3km within 1km	m m m m m m	Yes Yes No No No Yes Yes No		Less than Less than Less than Around RM20 Less than Around RM20 More than Less than Less than	n RM20 n RM20 n RM20 r RM40 r RM20 r RM40 n RM40 n RM20	4 4 2 3 4 3 5 3	
PriceRange PromotionImportance Ambiance WifiQuality Service \ 0 3 5 5 4 4								
1	3			4	4	4	5	
2	3			4	4	4	4	
3	1			4	3	3	3	
4	3			4	2	2	3	
116	4			5	4	2	3	
117	3			5	3	2	4	
118	5			5	5	5	5	
119	2			4	3	3	3	
120	4			4	4	4	4	
120	4			4	4	4	4	
BussinessMeetings Advertiser \ 0								
l disp	lays	2			Social Med	dia;In Stor	e	
2 3 In Store displays; Billboards								
3	3 Through friends and word of							
mout 4		3		S ⁻	tarbucks Websi	te/Apps;So	cial	
Medi	a							
• •								

```
4
                                                               Social
116
Media
                      4
                                       Starbucks Website/Apps; Social
117
Media
118
                         Starbucks Website/Apps;Social
Media; Emails; Dea...
119
                         Social Media; Through friends and word of
mouth...
120
                         Social Media; Through friends and word of
mouth...
    ContinueBuying
0
               Yes
1
               Yes
2
               Yes
3
                No
4
               Yes
                . . .
116
               Yes
117
               Yes
118
               Yes
119
                No
120
               Yes
[88 rows x 21 columns]
LowmidincomeData Continuecounts =
LowmidincomeData['ContinueBuying'].value counts()
LowmidincomeData Continuecounts
ContinueBuying
Yes
       69
       19
No
Name: count, dtype: int64
plt.figure(figsize=(8, 8))
plt.pie(LowmidincomeData Continuecounts,
labels=LowmidincomeData Continuecounts.index, autopct='%1.1f%',
startangle=140)
plt.title('Percentage of the low-middle income group for people not
continue Buying')
plt.show()
```

Percentage of the low-middle income group for people not continue Buying

