

```
In [1]: import pandas as pd

In [2]: import numpy as np

In [3]: import csv

In [4]: import matplotlib.pyplot as plt

In [5]: from sklearn.cluster import KMeans
from sklearn.preprocessing import LabelEncoder
from sklearn.preprocessing import MinMaxScaler
import seaborn as sns

In [6]: df=pd.read_csv(r"C:\Users\SIYA\Downloads\Customer Research Survey (Responses) - Form Responses 1.csv")

In [7]: df
```

Out[7]:

	Timestamp	What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	If you wish to be connected to this venture provide your contact information
0	06-05-2020 13:33	25-35	Male	Graduation	Ranchi	INR 2,00,000-5,00,000	Cooking, Art	Internet	Blogs, News Sites, FB groups, Instagram groups...	Facebook, Instagram, Twitter, LinkedIn	...	Creativity	Sustainability	Ideas	Vision/Mission	Popularity	
1	06-06-2020 16:59	below 25	Female	Post-graduation	Ranchi	Student	Singing, Writing	Internet	Blogs, News Sites, Quora	Facebook	...	Sustainability	Creativity	Ideas	Vision/Mission	Popularity	
2	06-07-2020 09:01	below 25	Male	Graduation	Hazaribagg	INR 2,00,000-5,00,000	Photography	Friends	NaN	Facebook, Instagram	...	Ideas	Honesty	Vision/Mission	Popularity	Sustainability	

In [8]: df.head()

Out[8]:

it s ir ?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	If you wish to be connected in future for this venture provide your email id and contact number below.	Unnamed: 33	Unnamed: 34	Unnamed: 35	Unnamed: 36
5	Male	Graduation	Ranchi	INR 2,00,000- 5,00,000	Cooking, Art	Internet	Blogs, News Sites, FB groups, Instagram groups...	Facebook, Instagram, Twitter, LinkedIn	...	Creativity	Sustainability	Ideas	Vision/Mission	Popularity	NaN	NaN	NaN	NaN	NaN
5	Female	Post- graduation	Ranchi	Student	Singing, Writing	Internet	Blogs, News Sites, Quora	Facebook	...	Sustainability	Creativity	Ideas	Vision/Mission	Popularity	NaN	NaN	NaN	NaN	NaN
5	Male	Graduation	Hazaribagg	INR 2,00,000- 5,00,000	Photography	Friends	NaN	Facebook, Instagram	...	Ideas	Honesty	Vision/Mission	Popularity	Sustainability	NaN	NaN	NaN	NaN	NaN
0	Male	Post- graduation	Bhubaneswar, Odisha	Student	Photography	Exploring	NaN	Instagram	...	Ideas	Creativity	Popularity	Sustainability	Honesty	NaN	NaN	NaN	NaN	NaN
5	Female	Graduation	Ranchi	Student	Dancing, Singing, Art	Internet, TV	Blogs, News Sites, FB groups	Facebook, Instagram, LinkedIn	...	Honesty	Vision/Mission	Ideas	Creativity	Popularity	NaN	NaN	NaN	NaN	NaN
;																			

```
In [23]: df
```

Out[23]:

	Timestamp	What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	If you wish to be connected to this venture provide your contact information
0	06-05-2020 13:33	25-35	Male	Graduation	Ranchi	INR 2,00,000-5,00,000	Cooking, Art	Internet	Blogs, News Sites, FB groups, Instagram groups...	Facebook, Instagram, Twitter, LinkedIn	...	Creativity	Sustainability	Ideas	Vision/Mission	Popularity	
1	06-06-2020 16:59	below 25	Female	Post-graduation	Ranchi	Student	Singing, Writing	Internet	Blogs, News Sites, Quora	Facebook	...	Sustainability	Creativity	Ideas	Vision/Mission	Popularity	
2	06-07-2020 09:01	below 25	Male	Graduation	Hazaribagg	INR 2,00,000-5,00,000	Photography	Friends	NaN	Facebook, Instagram	...	Ideas	Honesty	Vision/Mission	Popularity	Sustainability	

```
In [9]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 56 entries, 0 to 55
Data columns (total 37 columns):
#   Column                                                                                               Non-Null Count  Dtype
---  -
0   Timestamp                                                       56 non-null     object
1   What is your age?                                                56 non-null     object
2   What is your gender?                                             56 non-null     object
3   What is your education level?                                    56 non-null     object
4   Where do you live?                                              56 non-null     object
5   What is your household income?                                   56 non-null     object
6   What are your hobbies and interests?                            56 non-null     object
7   Where do you go for information?                                 56 non-null     object
8   If you chose 'internet' in the above question, What are your sources of information?  54 non-null     object
9   What social media platforms are you active on?                 56 non-null     object
10  Does your hobbies/profession require you to rent spaces?        56 non-null     object
11  If yes, how do you find the space for renting?                  40 non-null     object
12  Approximately how much will you be willing to pay to rent a space per hour? (in INR)  56 non-null     object
13  How do you like to make purchases (mode of payment)?            56 non-null     object
14  ...
```

In [10]: df.describe()

Out[10]:

	Timestamp	What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	If you wish to be connected in future for this venture provide your email id and contact number below.	Unnamed: 33
count	56	56	56	56	56	56	56	56	54	56	...	55	55	55	56	56	24	1
unique	56	3	3	6	34	6	51	12	23	18	...	6	6	6	6	6	23	1
top	6/19/2020 0:01:25	below 25	Male	Graduation	Bangalore	Student	Photography	Internet, Friends	Blogs, News Sites	Facebook, Instagram, LinkedIn	...	Creativity	Creativity	Sustainability	Sustainability	Popularity	Paraspundir25@gmail.com	Sustainability
freq	1	32	30	45	12	20	2	24	8	12	...	16	16	13	14	21	2	1

4 rows × 37 columns



In [12]: df.isnull().values.any()

Out[12]: True

In [13]: df.isnull().sum().sum()

Out[13]: 315

```
In [14]: df.isnull().any()
```

```
Out[14]: Timestamp                False
What is your age?                False
What is your gender?             False
What is your education level?    False
Where do you live?               False
What is your household income?   False
What are your hobbies and interests? False
Where do you go for information?  False
If you chose 'internet' in the above question, What are your sources of information? True
What social media platforms are you active on? False
Does your hobbies/profession require you to rent spaces? False
If yes, how do you find the space for renting? True
Approximately how much will you be willing to pay to rent a space per hour? (in INR) False
How do you like to make purchases (mode of payment)? False
According to you, how difficult is it to find spaces? False
Do you feel there is lack of spaces available for you to practice your hobby/profession? False
What are your biggest challenges when searching for spaces? True
Rank these parameters in their order of importance when you look for a space? [Rank 1] True
Rank these parameters in their order of importance when you look for a space? [Rank 2] True
Rank these parameters in their order of importance when you look for a space? [Rank 3] True
Rank these parameters in their order of importance when you look for a space? [Rank 4] True
Rank these parameters in their order of importance when you look for a space? [Rank 5] True
Rank these parameters in their order of importance when you look for a space? [Rank 6] True
Have you faced hassles while renting/booking spaces? False
Are you an android or iOS user? False
Do you prefer searching for your needs through browser or mobile applications? False
Rank these parameters in their order of importance to develop trust in a brand? [Rank 1] True
Rank these parameters in their order of importance to develop trust in a brand? [Rank 2] True
Rank these parameters in their order of importance to develop trust in a brand? [Rank 3] True
Rank these parameters in their order of importance to develop trust in a brand? [Rank 4] True
Rank these parameters in their order of importance to develop trust in a brand? [Rank 5] False
Rank these parameters in their order of importance to develop trust in a brand? [Rank 6] False
If you wish to be connected in future for this venture provide your email id and contact number below. True
Unnamed: 33                      True
Unnamed: 34                      True
Unnamed: 35                      True
Unnamed: 36                      True
dtype: bool
```

```
In [15]: df.isnull().sum()
```

```
Out[15]: Timestamp                                0
What is your age?                                0
What is your gender?                             0
What is your education level?                     0
Where do you live?                                0
What is your household income?                    0
What are your hobbies and interests?              0
Where do you go for information?                   0
If you chose 'internet' in the above question, What are your sources of information?  2
What social media platforms are you active on?    0
Does your hobbies/profession require you to rent spaces?  0
If yes, how do you find the space for renting?     16
Approximately how much will you be willing to pay to rent a space per hour? (in INR)  0
How do you like to make purchases (mode of payment)?  0
According to you, how difficult is it to find spaces?  0
Do you feel there is lack of spaces available for you to practice your hobby/profession?  0
What are your biggest challenges when searching for spaces?  2
Rank these parameters in their order of importance when you look for a space? [Rank 1]  7
Rank these parameters in their order of importance when you look for a space? [Rank 2]  6
Rank these parameters in their order of importance when you look for a space? [Rank 3]  6
Rank these parameters in their order of importance when you look for a space? [Rank 4]  4
Rank these parameters in their order of importance when you look for a space? [Rank 5]  7
Rank these parameters in their order of importance when you look for a space? [Rank 6]  9
Have you faced hassles while renting/booking spaces?  0
Are you an android or iOS user?                   0
Do you prefer searching for your needs through browser or mobile applications?  0
Rank these parameters in their order of importance to develop trust in a brand? [Rank 1]  1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]  1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]  1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]  1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]  0
Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]  0
If you wish to be connected in future for this venture provide your email id and contact number below.  32
Unnamed: 33                                         55
Unnamed: 34                                         55
Unnamed: 35                                         55
Unnamed: 36                                         55
dtype: int64
```

```
In [16]: df[df['What are your biggest challenges when searching for spaces?'].isnull()]
```

Out[16]:

	Timestamp	What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	If you wish to be connected in future for this venture provide your email id and contact number below.	Unnamed: 33	Unnamed: 34
22	6/13/2020 19:12:42	below 25	Prefer not to say	Graduation	WB	Student	Photography, Baking, Cooking, Art, Pottery, St...	Internet, Friends	Blogs, FB groups, Instagram groups	Facebook, Instagram, LinkedIn	...	Ideas	Vision/Mission	Popularity	Sustainability	Honesty	NaN	NaN	NaN
32	6/19/2020 9:14:01	below 25	Female	Graduation	I live in Wayanad, Kerala	INR 2,00,000-5,00,000	Photography, Cooking, Singing, Art, Pottery, S...	Internet, Friends	Blogs, News Sites, Quora	Instagram	...	Creativity	Honesty	Sustainability	Ideas	Popularity	snehalpare@gmail.com	NaN	NaN

2 rows × 37 columns

```
In [17]: df1=df.drop(['Timestamp', 'If you wish to be connected in future for this venture provide your email id and contact number below.'], axis=1)
```

```
In [18]: df1
```

Out[18]:

	What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	Does your hobbies/profession require you to rent spaces?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 1]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]
0	25-35	Male	Graduation	Ranchi	INR 2,00,000-5,00,000	Cooking, Art	Internet	Blogs, News Sites, FB groups, Instagram groups...	Facebook, Instagram, Twitter, LinkedIn	No	...	Honesty	Creativity	Sustainability	Ideas	Vision/Mission	Popularity
1	below 25	Female	Post-graduation	Ranchi	Student	Singing, Writing	Internet	Blogs, News Sites, Quora	Facebook	No	...	Honesty	Sustainability	Creativity	Ideas	Vision/Mission	Popularity
2	below 25	Male	Graduation	Hazaribagg	INR 2,00,000-5,00,000	Photography	Friends	NaN	Facebook, Instagram	Sometimes	...	Creativity	Ideas	Honesty	Vision/Mission	Popularity	Sustainability

```
In [19]: df1.shape
```

Out[19]: (56, 35)

```
In [20]: df['What is your age?'].value_counts()
```

Out[20]: below 25 32
25-35 20
35-50 4
Name: What is your age?, dtype: int64

```
In [21]: df['What is your age?'].value_counts(normalize=True)
```

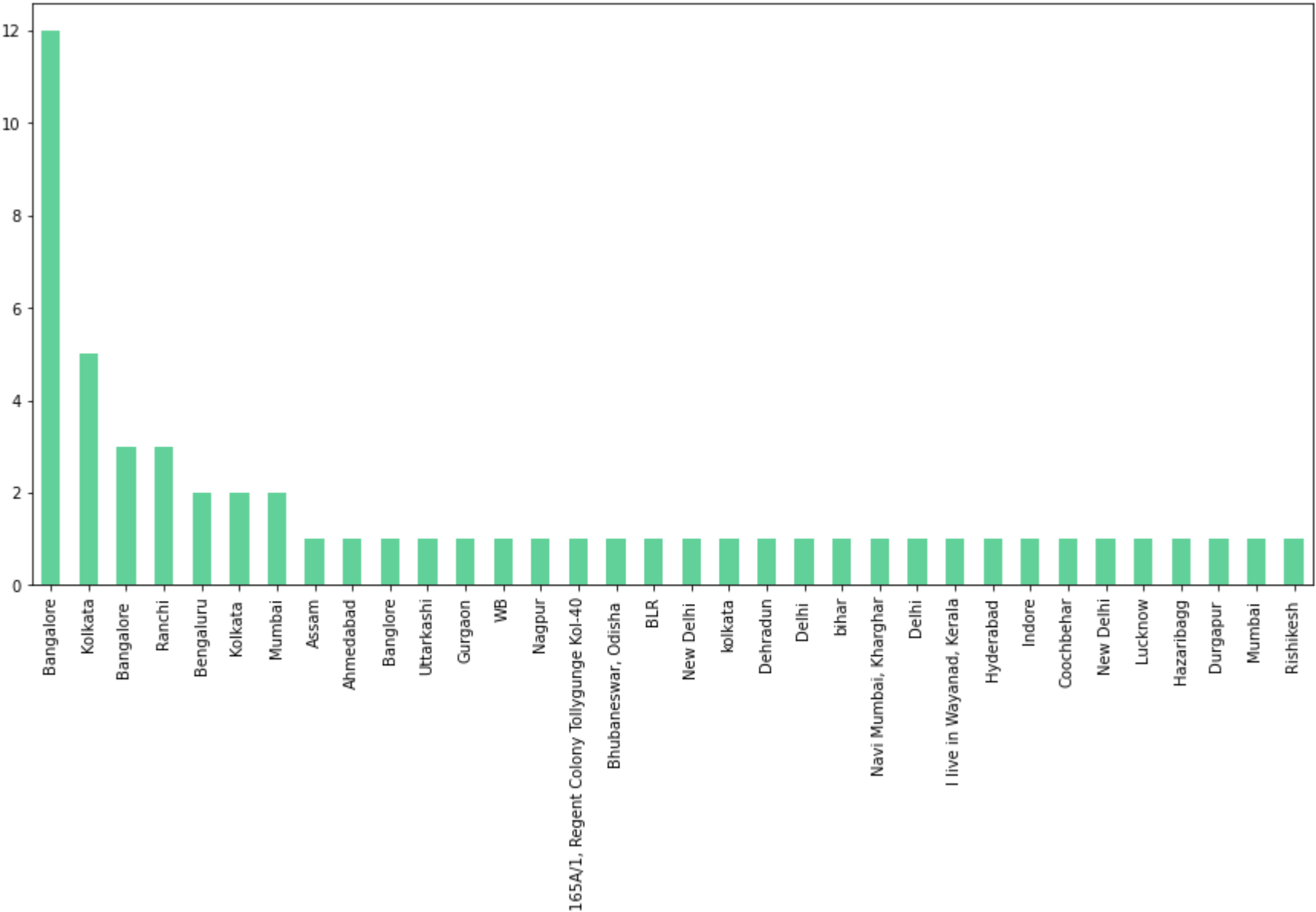
Out[21]: below 25 0.571429
25-35 0.357143
35-50 0.071429
Name: What is your age?, dtype: float64


```
In [27]: df1['Where do you live?'].values_count()
```

```
-----  
AttributeError                                Traceback (most recent call last)  
<ipython-input-27-c1a106235784> in <module>  
----> 1 df1['Where do you live?'].values_count()  
  
c:\python36\lib\site-packages\pandas\core\generic.py in __getattr__(self, name)  
    5272         if self._info_axis._can_hold_identifiers_and_holds_name(name):  
    5273             return self[name]  
-> 5274         return object.__getattr__(self, name)  
    5275  
    5276     def __setattr__(self, name: str, value) -> None:  
  
AttributeError: 'Series' object has no attribute 'values_count'
```

```
In [28]: df1['Where do you live?'].value_counts().plot(kind="bar", figsize=(15,7), color="#61d199")
```

Out[28]: <matplotlib.axes._subplots.AxesSubplot at 0x225e2f0de10>

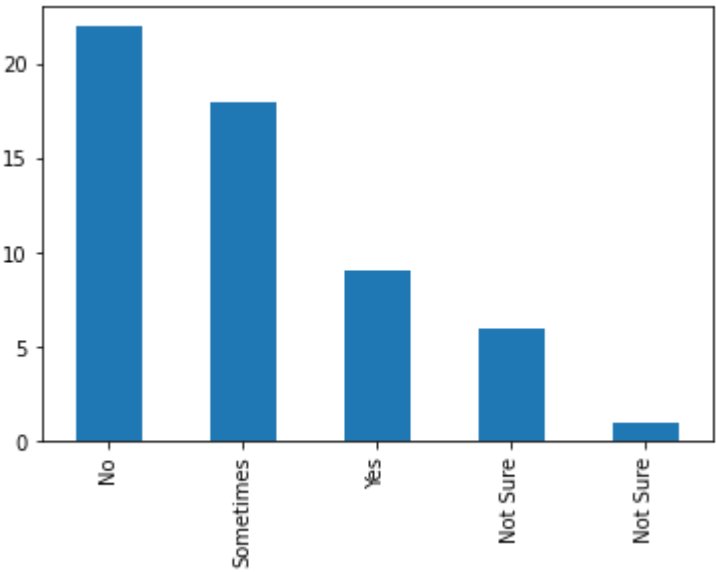


```
In [29]: df['What social media platforms are you active on?'].value_counts()
```

```
Out[29]: Facebook, Instagram, LinkedIn          12
Instagram                                     10
Facebook, Instagram, Twitter, LinkedIn        6
Instagram, LinkedIn                           5
Instagram, Twitter                            5
Facebook, Instagram                           3
Instagram, Twitter, LinkedIn                   2
Facebook, Instagram, Snapchat, Twitter, LinkedIn 2
Facebook                                       2
Facebook, Instagram, Twitter                   1
Facebook, Instagram, Snapchat, Twitter, LinkedIn, Reddit 1
Reddit                                         1
Instagram, Snapchat                           1
Facebook, Instagram, Snapchat, LinkedIn        1
Facebook, Instagram, Snapchat                 1
Quora                                          1
LinkedIn                                      1
Instagram, Twitter, LinkedIn, Tik Tok         1
Name: What social media platforms are you active on?, dtype: int64
```

```
In [30]: df['Does your hobbies/profession require you to rent spaces?'].value_counts().plot(kind='bar')
```

Out[30]: <matplotlib.axes._subplots.AxesSubplot at 0x225e2dbf400>



```
In [31]: said_yes = df[df['Does your hobbies/profession require you to rent spaces?'] == 'Yes']
```

```
In [32]: said_sometimes = df[df['Does your hobbies/profession require you to rent spaces?'] == 'Sometimes']
```

```
In [33]: said_no = df[df['Does your hobbies/profession require you to rent spaces?'] == 'No']
```

```
In [34]: print(said_yes['What is your age?'].value_counts())
```

```
25-35      5
below 25    4
Name: What is your age?, dtype: int64
```

```
In [35]: print(said_sometimes['What is your age?'].value_counts())
```

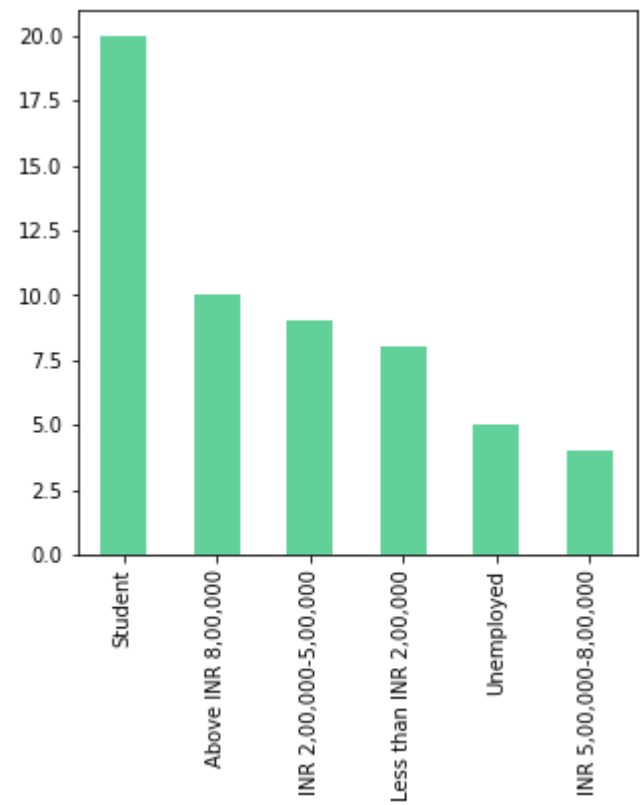
```
below 25    11
25-35       7
Name: What is your age?, dtype: int64
```

```
In [36]: print(said_no['What is your age?'].value_counts())
```

```
below 25    11
25-35       7
35-50       4
Name: What is your age?, dtype: int64
```

```
In [37]: df['What is your household income?'].value_counts().plot(kind="bar", figsize=(5,5), color="#61d199")
```

Out[37]: <matplotlib.axes._subplots.AxesSubplot at 0x225e2e27630>



```
In [38]: df["What are your hobbies and interests?"].describe()
```

Out[38]: count 56
unique 51
top Photography
freq 2
Name: What are your hobbies and interests?, dtype: object

```
In [39]: photography = df["What are your hobbies and interests?"].str.contains('Photography')  
photography.value_counts()
```

Out[39]: True 34
False 22
Name: What are your hobbies and interests?, dtype: int64

```
In [40]: cooking = df["What are your hobbies and interests?"].str.contains('Cooking')  
cooking.value_counts()
```

Out[40]: True 28
False 28
Name: What are your hobbies and interests?, dtype: int64

```
In [41]: singing = df["What are your hobbies and interests?"].str.contains('Singing')  
singing.value_counts()
```

Out[41]: False 40
True 16
Name: What are your hobbies and interests?, dtype: int64

```
In [42]: art = df["What are your hobbies and interests?"].str.contains('Art')  
art.value_counts()
```

Out[42]: True 39
False 17
Name: What are your hobbies and interests?, dtype: int64

```
In [43]: writing = df["What are your hobbies and interests?"].str.contains('Writing')  
writing.value_counts()
```

Out[43]: False 31
True 25
Name: What are your hobbies and interests?, dtype: int64

```
In [44]: yoga = df["What are your hobbies and interests?"].str.contains('Yoga')  
yoga.value_counts()
```

Out[44]: False 41
True 15
Name: What are your hobbies and interests?, dtype: int64

```
In [45]: sports = df["What are your hobbies and interests?"].str.contains('Sports')
sports.value_counts()
```

Out[45]: False 36
True 20
Name: What are your hobbies and interests?, dtype: int64

```
In [46]: hni = df1["What are your hobbies and interests?"].str.split(', ', expand=True)
hni.head()
```

Out[46]:

	0	1	2	3	4	5	6	7	8	9	10
0	Cooking	Art	None	None	None	None	None	None	None	None	None
1	Singing	Writing	None	None	None	None	None	None	None	None	None
2	Photography	None	None	None	None	None	None	None	None	None	None
3	Photography	None	None	None	None	None	None	None	None	None	None
4	Dancing	Singing	Art	None	None	None	None	None	None	None	None

```
In [47]: hobbies=hni.stack()
```

```
In [48]: hobbies.value_counts().plot(kind="bar", figsize=(10,8), color="#61d199")
```

Out[48]: <matplotlib.axes._subplots.AxesSubplot at 0x225e2e3a8d0>

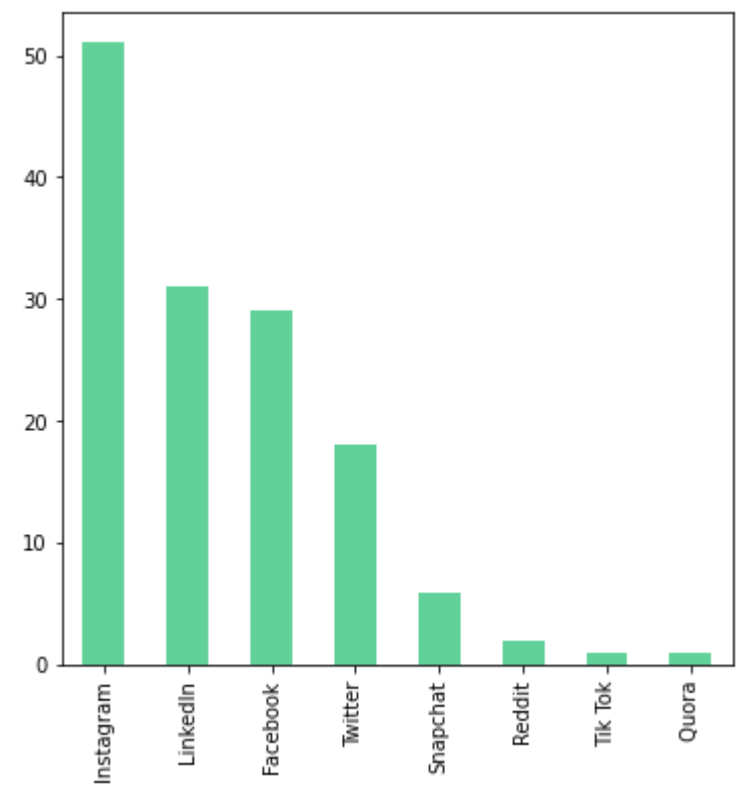


```
In [49]: sm = df1["What social media platforms are you active on?"].str.split(', ', expand=True)
```

```
In [50]: social_media=sm.stack()
```

```
In [51]: social_media.value_counts().plot(kind="bar", figsize=(6,6), color="#61d199")
```

Out[51]: <matplotlib.axes._subplots.AxesSubplot at 0x225e2e3a828>

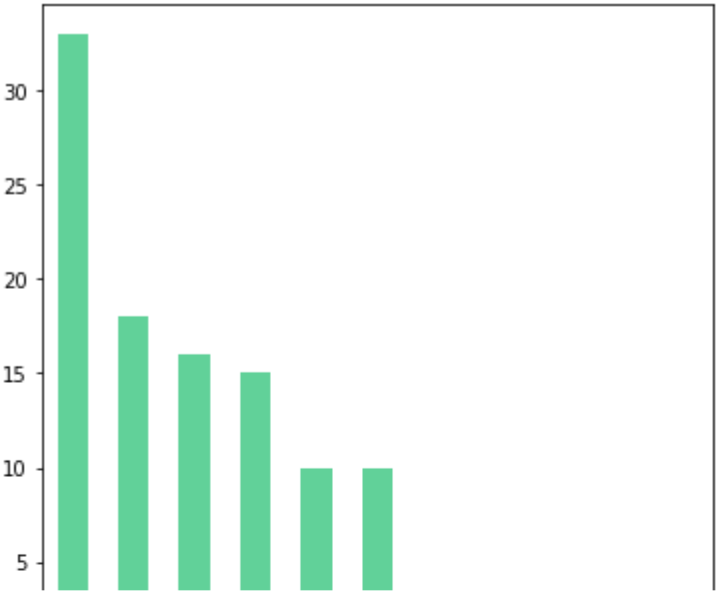


```
In [52]: sp = df1["What are your biggest challenges when searching for spaces?"].str.split(', ', expand=True)
```

```
In [53]: space_chlng=sp.stack()
```

```
In [54]: space_chlng.value_counts().plot(kind="bar", figsize=(6,6), color="#61d199")
```

```
Out[54]: <matplotlib.axes._subplots.AxesSubplot at 0x225e3298668>
```



```
In [55]: space_chlng.value_counts()
```

```
Out[55]: Expensive                                     33
Not many options in my profession/hobby                18
Difficult to trust                                     16
Lack of spaces                                         15
therefore confusion                                   10
Too many options                                       10
Not sure                                               2
Most spaces are pre Booked well in advance so unless I book early 1
Haven't had the need to look                          1
Less than 1000                                         1
there's no availability of space.                     1
dtype: int64
```



```
In [56]: df1.isnull().sum()
```

```
Out[56]: What is your age?                                0
What is your gender?                                    0
What is your education level?                           0
Where do you live?                                       0
What is your household income?                           0
What are your hobbies and interests?                     0
Where do you go for information?                          0
If you chose 'internet' in the above question, What are your sources of information?  2
What social media platforms are you active on?           0
Does your hobbies/profession require you to rent spaces?  0
If yes, how do you find the space for renting?           16
Approximately how much will you be willing to pay to rent a space per hour? (in INR)  0
How do you like to make purchases (mode of payment)?     0
According to you, how difficult is it to find spaces?     0
Do you feel there is lack of spaces available for you to practice your hobby/profession?  0
What are your biggest challenges when searching for spaces? 2
Rank these parameters in their order of importance when you look for a space? [Rank 1] 7
Rank these parameters in their order of importance when you look for a space? [Rank 2] 6
Rank these parameters in their order of importance when you look for a space? [Rank 3] 6
Rank these parameters in their order of importance when you look for a space? [Rank 4] 4
Rank these parameters in their order of importance when you look for a space? [Rank 5] 7
Rank these parameters in their order of importance when you look for a space? [Rank 6] 9
Have you faced hassles while renting/booking spaces?     0
Are you an android or iOS user?                          0
Do you prefer searching for your needs through browser or mobile applications?         0
Rank these parameters in their order of importance to develop trust in a brand? [Rank 1] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 2] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 3] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 4] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 5] 0
Rank these parameters in their order of importance to develop trust in a brand? [Rank 6] 0
Unnamed: 33                                               55
Unnamed: 34                                               55
Unnamed: 35                                               55
Unnamed: 36                                               55
dtype: int64
```

```
In [57]: df['If yes, how do you find the space for renting?'].value_counts()
```

```
Out[57]: Online                22
Friends                       9
Contacts                      6
my own space                  1
All of the above              1
pinterest                     1
Name: If yes, how do you find the space for renting?, dtype: int64
```

```
In [58]: df1['If yes, how do you find the space for renting?'].fillna('Other',inplace=True)
```

```
In [59]: df1[('Rank these parameters in their order of importance when you look for a space? [Rank 1]')].value_counts()
```

Out[59]: Price 12
Location 11
Features 8
Authenticity 7
Size 6
Ratings/Popularity 4
Cash 1
Name: Rank these parameters in their order of importance when you look for a space? [Rank 1], dtype: int64

```
In [60]: df1[('Rank these parameters in their order of importance when you look for a space? [Rank 2]')].value_counts()
```

Out[60]: Price 14
Features 9
Location 9
Size 8
Authenticity 5
Ratings/Popularity 4
Easy 1
Name: Rank these parameters in their order of importance when you look for a space? [Rank 2], dtype: int64

```
In [61]: df1[('Rank these parameters in their order of importance to develop trust in a brand? [Rank 1]')].value_counts()
```

Out[61]: Honesty 18
Vision/Mission 12
Creativity 9
Sustainability 8
Popularity 5
Ideas 3
Name: Rank these parameters in their order of importance to develop trust in a brand? [Rank 1], dtype: int64

```
In [62]: df1[('Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]')].value_counts()
```

Out[62]: Creativity 16
Honesty 13
Ideas 13
Sustainability 7
Vision/Mission 4
Popularity 2
Name: Rank these parameters in their order of importance to develop trust in a brand? [Rank 2], dtype: int64

```
In [87]: import plotly.graph_objs as go
import plotly.offline as py
cnt_srs = df1['What is your education level?'].value_counts()

trace = go.Scatter(
    x=cnt_srs.index,
    y=cnt_srs.values,
    mode='markers',
    marker=dict(
        sizemode = 'diameter',
        sizeref = 1,
        size = 30,
        #color = np.random.randn(500), #set color equal to a variable
        color = cnt_srs.values,
        colorscale='Portland',
        showscale=True
    ),
)

layout = go.Layout(
    title='Formal Education distribution'
)

data = [trace]
fig = go.Figure(data=data, layout=layout)
py.iplot(fig, filename="formaleducation")
```

```
In [86]: nan_value = float("NaN")  
  
df1.replace('Education Sucks', nan_value, inplace=True)
```

```
In [88]: nan_value = float("NaN")  
  
df1.replace('12th passed', nan_value, inplace=True)
```

```
In [66]: nan_value = float("NaN")  
  
df1.replace('Higher Secondary', nan_value, inplace=True)
```

```
In [67]: nan_value = float("NaN")  
  
df1.replace('High school', nan_value, inplace=True)
```

```
In [68]: df1['What is your education level?'].fillna('Others',inplace=True)
```

```
In [69]: df1.isnull().sum()
```

```
Out[69]: What is your age? 0
What is your gender? 0
What is your education level? 0
Where do you live? 0
What is your household income? 0
What are your hobbies and interests? 0
Where do you go for information? 0
If you chose 'internet' in the above question, What are your sources of information? 2
What social media platforms are you active on? 0
Does your hobbies/profession require you to rent spaces? 0
If yes, how do you find the space for renting? 0
Approximately how much will you be willing to pay to rent a space per hour? (in INR) 0
How do you like to make purchases (mode of payment)? 0
According to you, how difficult is it to find spaces? 0
Do you feel there is lack of spaces available for you to practice your hobby/profession? 0
What are your biggest challenges when searching for spaces? 2
Rank these parameters in their order of importance when you look for a space? [Rank 1] 7
Rank these parameters in their order of importance when you look for a space? [Rank 2] 6
Rank these parameters in their order of importance when you look for a space? [Rank 3] 6
Rank these parameters in their order of importance when you look for a space? [Rank 4] 4
Rank these parameters in their order of importance when you look for a space? [Rank 5] 7
Rank these parameters in their order of importance when you look for a space? [Rank 6] 9
Have you faced hassles while renting/booking spaces? 0
Are you an android or iOS user? 0
Do you prefer searching for your needs through browser or mobile applications? 0
Rank these parameters in their order of importance to develop trust in a brand? [Rank 1] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 2] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 3] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 4] 1
Rank these parameters in their order of importance to develop trust in a brand? [Rank 5] 0
Rank these parameters in their order of importance to develop trust in a brand? [Rank 6] 0
Unnamed: 33 55
Unnamed: 34 55
Unnamed: 35 55
Unnamed: 36 55
dtype: int64
```

In [90]:

df1.head()

Out[90]:

	What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	Does your hobbies/profession require you to rent spaces?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 1]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	Unnamed: 33	Ur
0	25-35	Male	Graduation	Ranchi	INR 2,00,000-5,00,000	Cooking, Art	Internet	Blogs, News Sites, FB groups, Instagram groups...	Facebook, Instagram, Twitter, LinkedIn	No	...	Honesty	Creativity	Sustainability	Ideas	Vision/Mission	Popularity	NaN	
1	below 25	Female	Post-graduation	Ranchi	Student	Singing, Writing	Internet	Blogs, News Sites, Quora	Facebook	No	...	Honesty	Sustainability	Creativity	Ideas	Vision/Mission	Popularity	NaN	
2	below 25	Male	Graduation	Hazaribagg	INR 2,00,000-5,00,000	Photography	Friends	NaN	Facebook, Instagram	Sometimes	...	Creativity	Ideas	Honesty	Vision/Mission	Popularity	Sustainability	NaN	
3	35-50	Male	Post-graduation	Bhubaneswar, Odisha	Student	Photography	Exploring	NaN	Instagram	No	...	Vision/Mission	Ideas	Creativity	Popularity	Sustainability	Honesty	NaN	
4	below 25	Female	Graduation	Ranchi	Student	Dancing, Singing, Art	Internet, TV	Blogs, News Sites, FB groups	Facebook, Instagram, LinkedIn	Yes	...	Sustainability	Honesty	Vision/Mission	Ideas	Creativity	Popularity	NaN	

5 rows × 35 columns



In [70]:

df1['Have you faced hassles while renting/booking spaces?'].value_counts()

Out[70]:

Don't know26
Yes22
No8
Name: Have you faced hassles while renting/booking spaces?, dtype: int64

In [108]:

df1.at[39,'Approximately how much will you be willing to pay to rent a space per hour? (in INR)']= 'less than 1000'

```
In [109]: df1[df1["Approximately how much will you be willing to pay to rent a space per hour? (in INR)"]==',Facebook']
```

Out[109]:

What is your age?	What is your gender?	What is your education level?	Where do you live?	What is your household income?	What are your hobbies and interests?	Where do you go for information?	If you chose 'internet' in the above question, What are your sources of information?	What social media platforms are you active on?	Does your hobbies/profession require you to rent spaces?	...	Rank these parameters in their order of importance to develop trust in a brand? [Rank 1]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 2]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 3]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 4]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 5]	Rank these parameters in their order of importance to develop trust in a brand? [Rank 6]	Unnamed: 33	Unnamed: 34	Unnamed: 35
0 rows × 35 columns																			



```
In [110]: import researchpy as rp
rp.summary_cat(df1[["What is your age?", "What is your gender?","What is your household income?","What is your education level?","Approximately how much will you be willing to pay to rent"]])
```

Out[110]:

	Variable	Outcome	Count	Percent
0	What is your age?	below 25	32	57.14
1		25-35	20	35.71
2		35-50	4	7.14
3	What is your gender?	Male	30	53.57
4		Female	25	44.64
5		Prefer not to say	1	1.79
6	What is your household income?	Student	20	35.71
7		Above INR 8,00,000	10	17.86
8		INR 2,00,000-5,00,000	9	16.07
9		Less than INR 2,00,000	8	14.29
10		Unemployed	5	8.93
11		INR 5,00,000-8,00,000	4	7.14
12	What is your education level?	Graduation	45	80.36
13		Post-graduation	7	12.50
14		Others	4	7.14
15	Approximately how much will you be willing to ...	Less than 1000	37	66.07
16		1000-2000	14	25.00
17		2000-3000	3	5.36
18		less than 1000	1	1.79
19		3000-4000	1	1.79

```
In [115]: crosstab1 = pd.crosstab(df1["What is your gender?"], df1["Does your hobbies/profession require you to rent spaces?"])
crosstab1
```

Out[115]:

Does your hobbies/profession require you to rent spaces?	Not Sure	No	Not Sure	Sometimes	Yes
What is your gender?					
Female	0	9	4	7	5
Male	1	12	2	11	4
Prefer not to say	0	1	0	0	0


```
In [73]: #Hypothesis1:gender and requirement_of_renting_spaces are independent
import scipy.stats as stats
stats.chi2_contingency(crosstab1)
#null hypothesis not rejected:no significant relationship
```

```
Out[73]: (4.2820202020202025,
0.8308244322394953,
8,
array([[ 0.44642857,  9.82142857,  2.67857143,  8.03571429,  4.01785714],
[ 0.53571429, 11.78571429,  3.21428571,  9.64285714,  4.82142857],
[ 0.01785714,  0.39285714,  0.10714286,  0.32142857,  0.16071429]]))
```

```
In [74]: df1['According to you, how difficult is it to find spaces?'].value_counts()
```

```
Out[74]: Difficult      25
Not so Difficult    21
Very Difficult      8
Easy                1
No                  1
Name: According to you, how difficult is it to find spaces?, dtype: int64
```

```
In [75]: df1.head()
```

...

```
In [76]: type(['Does your hobbies/profession require you to rent spaces?'])
```

```
Out[76]: list
```

```
In [99]: df1.columns = df1.columns.str.strip()
```

```
In [77]: df1["Approximately how much will you be willing to pay to rent a space per hour? (in INR)"]
```

...

```
In [132]: crosstab2 = pd.crosstab(df1["What is your household income?"], df1["Approximately how much will you be willing to pay to rent a space per hour? (in INR)"])
crosstab2
```

Out[132]:

Approximately how much will you be willing to pay to rent a space per hour? (in INR)	1000-2000	2000-3000	3000-4000	Less than 1000	less than 1000
What is your household income?					
Above INR 8,00,000	1	2	1	6	0
INR 2,00,000-5,00,000	3	0	0	6	0
INR 5,00,000-8,00,000	4	0	0	0	0
Less than INR 2,00,000	0	0	0	7	1
Student	3	1	0	16	0
Unemployed	3	0	0	2	0

```
In [79]: #Hypothesis2:income and rent_willing_to_pay
import scipy.stats as stats
stats.chi2_contingency(crosstab2)
#null hypothesis rejected: significant relationship
```

Out[79]: (35.756756756756765,
0.01642495459554218,
20,
array([[0.17857143, 2.5 , 0.53571429, 0.17857143, 6.60714286],
[0.16071429, 2.25 , 0.48214286, 0.16071429, 5.94642857],
[0.07142857, 1. , 0.21428571, 0.07142857, 2.64285714],
[0.14285714, 2. , 0.42857143, 0.14285714, 5.28571429],
[0.35714286, 5. , 1.07142857, 0.35714286, 13.21428571],
[0.08928571, 1.25 , 0.26785714, 0.08928571, 3.30357143]]))

```
In [80]: crosstab3 = pd.crosstab(df1["What is your age?"], df1["Approximately how much will you be willing to pay to rent a space per hour? (in INR)"])
crosstab3
```

Out[80]:

Approximately how much will you be willing to pay to rent a space per hour? (in INR)	Facebook	1000-2000	2000-3000	3000-4000	Less than 1000
What is your age?					
25-35	0	6	2	0	12
35-50	0	1	0	0	3
below 25	1	7	1	1	22

```
In [81]: #Hypothesis3:age and rent_willing_to_pay
stats.chi2_contingency(crosstab3)
#null hypothesis not rejected:no significant relationship
```

Out[81]: (3.336261261261262,
0.9115193691361795,
8,
array([[0.35714286, 5. , 1.07142857, 0.35714286, 13.21428571],
[0.07142857, 1. , 0.21428571, 0.07142857, 2.64285714],
[0.57142857, 8. , 1.71428571, 0.57142857, 21.14285714]]))

```
In [82]: crosstab4 = pd.crosstab(df1["What is your gender?"], df1["According to you, how difficult is it to find spaces?"])
crosstab4
```

Out[82]:

According to you, how difficult is it to find spaces?	Difficult	Easy	No	Not so Difficult	Very Difficult
What is your gender?					
Female	13	0	0	6	6
Male	11	1	1	15	2
Prefer not to say	1	0	0	0	0

```
In [83]: #Hypothesis4:gender and space_finding_difficulty
stats.chi2_contingency(crosstab4)
#null hypothesis not rejected:no significant relationship
```

Out[83]: (9.003733333333331,
0.34198111377084056,
8,
array([[11.16071429, 0.44642857, 0.44642857, 9.375 , 3.57142857],
[13.39285714, 0.53571429, 0.53571429, 11.25 , 4.28571429],
[0.44642857, 0.01785714, 0.01785714, 0.375 , 0.14285714]]))

```
In [84]: crosstab5 = pd.crosstab(df1["What is your education level?"], df1["Approximately how much will you be willing to pay to rent a space per hour? (in INR)"])
crosstab5
#Hypothesis5:education and rent_willling_to_pay
stats.chi2_contingency(crosstab5)
#null hypothesis not rejected:no significant relationship
```

Out[84]: (3.1323895323895323,
0.9257765577424439,
8,
array([[0.80357143, 11.25 , 2.41071429, 0.80357143, 29.73214286],
[0.07142857, 1. , 0.21428571, 0.07142857, 2.64285714],
[0.125 , 1.75 , 0.375 , 0.125 , 4.625]]))

```
In [138]: df1.to_csv("Highspace Customer Survey.csv")
```

```
In [ ]:
```