Ecommerce_Purchase_QUESTION/ANSWERED_BASED_EDA_PROJECT_VIVEK_CHAU

In [1]:
```python
# upload the necessary libraries to work with dataset

import pandas as pd
import numpy as np
```

In [45]:
```python
# forward / is used for path and read the dataset.

data = pd.read_csv("C:/Users/VIVEK CHAUHAN/Desktop/eda-projects (1)/2-ecommerce-project (1)/Ecommerce Purchases (1).csv")
data
```

Out[45]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email
0	16629 Pace Camp Apt. 448\nAlexisborough, NE 77...	46 in	PM	Opera/9.56.(X11; Linux x86_64; sl-SI) Presto/2...	Martinez-Herman	6.011930e+15	Feb-20	900	JCB 16 digit	pdunlap@yahoo.com
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	Opera/8.93. (Windows 98; Win 9x 4.90; en-US) Pr...	Fletcher, Richards and Whitaker	3.337760e+15	Nov-18	561	Mastercard	anthony41@reed.com
2	Unit 0065 Box 5052\nDPO AP 27450	94 vE	PM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Simpson, Williams and Pham	6.759580e+11	Aug-19	699	JCB 16 digit	amymiller@morales-harrison.com
3	7780 Julia Fords\nNew Stacy, WA 45798	36 vm	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_0 ...	Williams, Marshall and Buchanan	6.011580e+15	Feb-24	384	Discover	brent16@olson-robinson.info
4	23012 Munoz Drive Suite 337\nNew Cynthia, TX 5...	20 IE	AM	Opera/9.58.(X11; Linux x86_64; it-IT) Presto/2...	Brown, Watson and Andrews	6.011460e+15	Oct-25	678	Diners Club / Carte Blanche	christopherwright@gmail.com
...	...	...	...	...	...	...	...	...	...	...
9995	966 Castaneda Locks\nWest Juliafurt, CO 96415	92 XI	PM	Mozilla/5.0 (Windows NT 5.1) AppleWebKit/5352 ...	Randall-Sloan	3.429450e+14	Mar-22	838	JCB 15 digit	iscott@wade-garner.com
9996	832 Curtis Dam Suite 785\nNorth Edwardburgh, T...	41 JY	AM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Hale, Collins and Wilson	2.100330e+14	Jul-25	207	JCB 16 digit	mary85@hotmail.com
9997	Unit 4434 Box 6343\nDPO AE 28026-	74 Zh	AM	Mozilla/5.0 (Macintosh; U;	Anderson Ltd	6.011540e+15	May-21	1	VISA 16 digit	tyler16@gmail.com

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email
	0283			Intel Mac OS X 10_7...						
9998	0096 English Rest\nRoystad, IA 12457	74 cL	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_8;...	Cook Inc	1.800030e+14	Nov-17	987	American Express	elizabethmoore@reid.net
9999	40674 Barrett Stravenue\nGrimesville, WI 79682	64 Hr	AM	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	Greene Inc	4.139970e+15	Feb-19	302	JCB 15 digit	rachelford@vaughn.com

10000 rows × 14 columns

In [3]:
```python
# display top 10 rows of the dataset

data.head(10)
```

Out[3]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Ema
0	16629 Pace Camp Apt. 448\nAlexisborough, NE 77...	46 in	PM	Opera/9.56.(X11; Linux x86_64; sl-SI) Presto/2...	Martinez-Herman	6.011930e+15	Feb-20	900	JCB 16 digit	pdunlap@yahoo.co
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	Opera/8.93. (Windows 98; Win 9x 4.90; en-US) Pr...	Fletcher, Richards and Whitaker	3.337760e+15	Nov-18	561	Mastercard	anthony41@reed.co
2	Unit 0065 Box 5052\nDPO AP 27450	94 vE	PM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Simpson, Williams and Pham	6.759580e+11	Aug-19	699	JCB 16 digit	amymiller@morale harrison.co
3	7780 Julia Fords\nNew Stacy, WA 45798	36 vm	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_0 ...	Williams, Marshall and Buchanan	6.011580e+15	Feb-24	384	Discover	brent16@olson-robinson.in
4	23012 Munoz Drive Suite 337\nNew Cynthia, TX 5...	20 IE	AM	Opera/9.58.(X11; Linux x86_64; it-IT) Presto/2...	Brown, Watson and Andrews	6.011460e+15	Oct-25	678	Diners Club / Carte Blanche	christopherwright@gmail.co
5	7502 Powell Mission Apt. 768\nTravisland, VA 3...	21 XT	PM	Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_8_5...	Silva-Anderson	3.024620e+13	Jul-25	7169	Discover	ynguyen@gmail.co
6	93971 Conway Causeway\nAndersonburgh, AZ 75107	96 Xt	AM	Mozilla/5.0 (compatible; MSIE 7.0; Windows NT ...	Gibson and Sons	6.011400e+15	Jul-24	714	VISA 16 digit	olivia04@yahoo.co
7	260 Rachel Plains Suite 366\nCastroberg, WV 24...	96 pG	PM	Mozilla/5.0 (X11; Linux i686) AppleWebKit/5350...	Marshall-Collins	5.612520e+11	Jun-25	256	VISA 13 digit	phillip48@parks.in
8	2129 Dylan Burg\nNew Michelle, ME 28650	45 JN	PM	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...	Galloway and Sons	1.800420e+14	Apr-24	899	JCB 16 digit	kdavis@rasmussen.co

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Em
9	3795 Dawson Extensions\nLake Tinafort, ID 88739	15 Ug	AM	Mozilla/5.0 (X11; Linux i686; rv:1.9.7.20) Gec...	Rivera, Buchanan and Ramirez	4.396280e+12	Jan-17	931	American Express	qcoleman@hunt-huerta.co

In [4]:

```
# check last 10 rows of the dataset

data.tail(10)
```

Out[4]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email
9990	75731 Molly Springs\nWest Danielle, VT 96934-5102	93 ty	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_7_4;...	Pace, Vazquez and Richards	8.699680e+14	Apr-24	877	JCB 15 digit	andersonmichael@sherman.biz
9991	PSC 8165, Box 8498\nAPO AP 60327-0346	50 dA	AM	Mozilla/5.0 (compatible; MSIE 8.0; Windows NT ...	Snyder Inc	4.221580e+15	Feb-24	969	Voyager	kking@wise-liu.com
9992	885 Allen Mountains Apt. 230\nWallhaven, LA 16995	40 vH	PM	Mozilla/5.0 (Macintosh; PPC Mac OS X 10_6_5) A...	Wells Ltd	4.664830e+15	Oct-20	431	Discover	bberry@wright.net
9993	7555 Larson Locks Suite 229\nEllisburgh, MA 34...	72 jg	PM	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_8...	Colon and Sons	3.002560e+13	Oct-25	629	Maestro	chelseawilliams@lopez.biz
9994	6276 Rojas Hollow\nLake Louis, WY 56410-7837	93 Ex	PM	Opera/9.68.(X11; Linux x86_64; sl-SI) Presto/2...	Ritter-Smith	3.112190e+15	Jan-25	1823	Maestro	iroberts@gmail.com
9995	966 Castaneda Locks\nWest Juliafurt, CO 96415	92 XI	PM	Mozilla/5.0 (Windows NT 5.1) AppleWebKit/5352 ...	Randall-Sloan	3.429450e+14	Mar-22	838	JCB 15 digit	iscott@wade-garner.com
9996	832 Curtis Dam Suite 785\nNorth Edwardburgh, T...	41 JY	AM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Hale, Collins and Wilson	2.100330e+14	Jul-25	207	JCB 16 digit	mary85@hotmail.com
9997	Unit 4434 Box 6343\nDPO AE 28026-0283	74 Zh	AM	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...	Anderson Ltd	6.011540e+15	May-21	1	VISA 16 digit	tyler16@gmail.com

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email
9998	0096 English Rest\nRoystad, IA 12457	74 cL	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_8;...	Cook Inc	1.800030e+14	Nov-17	987	American Express	elizabethmoore@reid.net
9999	40674 Barrett Stravenue\nGrimesville, WI 79682	64 Hr	AM	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	Greene Inc	4.139970e+15	Feb-19	302	JCB 15 digit	rachelford@vaughn.com

In [5]:
```python
# check datatype of each column

data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 14 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   Address           10000 non-null  object
 1   Lot               10000 non-null  object
 2   AM or PM          10000 non-null  object
 3   Browser Info      10000 non-null  object
 4   Company           10000 non-null  object
 5   Credit Card       10000 non-null  float64
 6   CC Exp Date       10000 non-null  object
 7   CC Security Code  10000 non-null  int64
 8   CC Provider       10000 non-null  object
 9   Email             10000 non-null  object
 10  Job               10000 non-null  object
 11  IP Address        10000 non-null  object
 12  Language          10000 non-null  object
 13  Purchase Price    10000 non-null  float64
dtypes: float64(2), int64(1), object(11)
memory usage: 1.1+ MB
```

In [6]:
```python
# check null values in the dataset

data.isnull()
```

Out[6]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email	Job	IP Address	Language	Purchase Price
0	False	False	False	False	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9995	False	False	False	False	False	False	False	False	False	False	False	False	False	False
9996	False	False	False	False	False	False	False	False	False	False	False	False	False	False
9997	False	False	False	False	False	False	False	False	False	False	False	False	False	False
9998	False	False	False	False	False	False	False	False	False	False	False	False	False	False
9999	False	False	False	False	False	False	False	False	False	False	False	False	False	False

10000 rows × 14 columns

In [7]:
```python
# total sum for how many cells contain nan,empty or null value

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

```
Out[7]:  Address             0
         Lot                 0
         AM or PM            0
         Browser Info        0
         Company             0
         Credit Card         0
         CC Exp Date         0
         CC Security Code    0
         CC Provider         0
         Email               0
         Job                 0
         IP Address          0
         Language            0
         Purchase Price      0
         dtype: int64
```

In [8]:
```python
# hwo many rows & columns are there in the dataset?

data.shape
```

Out[8]: (10000, 14)

In [9]:
```python
# print all the column names

data.columns
```

Out[9]:
```
Index(['Address', 'Lot', 'AM or PM', 'Browser Info', 'Company', 'Credit Card',
       'CC Exp Date', 'CC Security Code', 'CC Provider', 'Email', 'Job',
       'IP Address', 'Language', 'Purchase Price'],
      dtype='object')
```

In [10]:
```python
# length of all the columns

len(data.columns)
```

Out[10]: 14

In [11]:
```python
# length of all the rows of the data
```

```
len(data)
```

Out[11]: 10000

In [12]:
```python
# highest purchase prices

data["Purchase Price"].max()
```

Out[12]: 99.99

In [13]:
```python
# lowest purchase prices

data["Purchase Price"].min()
```

Out[13]: 0.0

In [14]:
```python
# average purchase price

data["Purchase Price"].mean()
```

Out[14]: 50.347302

In [15]:
```python
# or method for count the how many people have their french "fr" as their language?

len(data[data["Language"]=="fr"])
```

Out[15]: 1097

In [16]:
```python
# How many people have their french "fr" as their language? condition true or false counts

a = data["Language"]=="fr"
a.value_counts()
```

Out[16]:
```
Language
False    8903
True     1097
Name: count, dtype: int64
```

In [17]:
```python
# for column wise count the data where language == "fr"

data[data["Language"]=="fr"].count()
```

Out[17]:
```
Address            1097
Lot                1097
AM or PM           1097
Browser Info       1097
Company            1097
Credit Card        1097
CC Exp Date        1097
CC Security Code   1097
CC Provider        1097
Email              1097
Job                1097
IP Address         1097
Language           1097
Purchase Price     1097
dtype: int64
```

In [18]:
```python
# find email of the person with the following ip address: 132.207.160.22

a = data["IP Address"] == "132.207.160.22"
b = data["Email"]
ans = b.where(a)
ans.dropna()
```

Out[18]:
```
2    amymiller@morales-harrison.com
Name: Email, dtype: object
```

In [19]:
```python
# or method to get where the ip-address match with the email id but the
# total columns print where the condition is match

data[data["IP Address"]=="132.207.160.22"]
```

Out[19]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email	Job	IP Address	La
2	Unit 0065 Box 5052\nDPO AP 27450	94 vE	PM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT …	Simpson, Williams and Pham	6.759580e+11	Aug-19	699	JCB 16 digit	amymiller@morales-harrison.com	Customer service manager	132.207.160.22	

In [20]:
```
# or method where the ip-address is match we extract that peson's email id

data[data["IP Address"]=="132.207.160.22"]["Email"]
```

Out[20]:   2   amymiller@morales-harrison.com
            Name: Email, dtype: object

In [24]:
```
# job titles contains engineer and case is whatever.


data[data['Job'].str.contains('engineer',case = False)]
```

Out[24]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email	
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	Opera/8.93. (Windows 98; Win 9x 4.90; en-US) Pr...	Fletcher, Richards and Whitaker	3.337760e+15	Nov-18	561	Mastercard	anthony41@reed.com	Dr eng
3	7780 Julia Fords\nNew Stacy, WA 45798	36 vm	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_0 ...	Williams, Marshall and Buchanan	6.011580e+15	Feb-24	384	Discover	brent16@olson-robinson.info	Dr eng
50	41159 Michael Centers\nAdamsfort, RI 37108-6674	46 Ce	PM	Mozilla/5.0 (Windows 98; Win 9x 4.90; sl-SI; r...	Wright, Williams and Mendez	4.008590e+15	May-19	945	JCB 16 digit	susanvalentine@obrien.org	Mecha eng
55	27635 Maureen Bypass Apt. 883\nSandraview, SD ...	59 LJ	AM	Mozilla/5.0 (iPod; U; CPU iPhone OS 3_3 like M...	Sims-Lyons	3.158110e+15	Sep-19	857	VISA 16 digit	adkinsarthur@yahoo.com	Engi broadca (operat
60	7126 Katherine Squares\nPerkinsview, CO 97299-...	63 qu	AM	Opera/8.68. (X11; Linux x86_64; en-US) Presto/2...	Marshall-Fernandez	3.497680e+14	May-20	672	JCB 15 digit	sweeneyhannah@jones.biz	Engi agricu
...	...	...	...	...	...	...	...	...	...	...	...
9948	95544 Johnson Isle Suite 939\nMichaelberg, RI ...	91 bW	AM	Opera/8.36. (X11; Linux x86_64; sl-SI) Presto/2...	Fox-Peterson	4.762920e+12	Mar-17	567	Mastercard	haleybenjamin@gmail.com	Struc eng

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email	
9952	9991 Vaughn Hills\nRacheltown, PA 55409	36 KC	PM	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	Ward, Smith and Castillo	6.011680e+15	Sep-19	964	Voyager	jonesjennifer@olson.com	Engi er
9970	0060 Keith Stream\nWestport, CO 47097	11 nt	PM	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_8...	Carpenter, Good and Hart	6.011490e+15	Jul-19	543	Discover	rangelbrian@hotmail.com	Elec eng
9977	02182 Keith Expressway\nEast Shannon, CT 20578...	34 RL	AM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Deleon, Jacobson and Benton	4.186090e+15	Jun-21	397	JCB 16 digit	daltoncarter@yahoo.com	Biome eng
9996	832 Curtis Dam Suite 785\nNorth Edwardburgh, T...	41 JY	AM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Hale, Collins and Wilson	2.100330e+14	Jul-25	207	JCB 16 digit	mary85@hotmail.com	En eng

984 rows × 14 columns

```
In [25]:  # print the length of job title contains engineer and case is whatever.

          len(data[data['Job'].str.contains('engineer',case = False)])
```

Out[25]: 984

```
In [26]:  # or method # how many people have mastercard as their credit card provider & made a purchase
          # above 50?
```

```python
len(data[(data["CC Provider"]=="Mastercard") & (data["Purchase Price"]>50)])
```

Out[26]: 405

In [27]:
```python
# for column wise count the data

data[(data["CC Provider"]=="Mastercard") & (data["Purchase Price"]>50)].count()
```

Out[27]: Address   405
          Lot   405
          AM or PM   405
          Browser Info   405
          Company   405
          Credit Card   405
          CC Exp Date   405
          CC Security Code   405
          CC Provider   405
          Email   405
          Job   405
          IP Address   405
          Language   405
          Purchase Price   405
          dtype: int64

In [28]:
```python
# how many people have mastercard as their credit card provider & made a purchase
# above 50?

a = data["CC Provider"]=="Mastercard"
b = data["Purchase Price"]>=50

ans = data.where(a & b)
ans
ans["CC Provider"].value_counts()
```

Out[28]: CC Provider
          Mastercard   405
          Name: count, dtype: int64

In [37]:
```python
# or method to get the email id where the credit card number is match

data[data['Credit Card']==4664825258997302]['Email']
```

Out[37]: Series([], Name: Email, dtype: object)

In [34]:
```python
# find email of the person with the following credit card number:4664825258997302

a = data["Credit Card"] == 4664825258997302
b = data["Email"]

ans = data.where(a & b)
ans
ans["Email"].value_counts()
```

Out[34]: Series([], Name: count, dtype: int64)

In [31]:
```python
# other method how many people purchase during the AM & hwo many people purchase during the PM?

data["AM or PM"].value_counts()
```

Out[31]:
```
AM or PM
PM     5068
AM     4932
Name: count, dtype: int64
```

In [32]:
```python
# how many people purchase during the AM & hwo many people purchase during the PM?

a = data["AM or PM"]=="AM"
a.value_counts() # FALSE MEANS PM AND TRUE MEANS AM.
```

Out[32]:
```
AM or PM
False    5068
True     4932
Name: count, dtype: int64
```

In [38]:
```python
# how many people have a credit card that expires in 2020.

data['CC Exp Date']
```

```
Out[38]:   0          Feb-20
           1          Nov-18
           2          Aug-19
           3          Feb-24
           4          Oct-25
                       ...
           9995       Mar-22
           9996       Jul-25
           9997       May-21
           9998       Nov-17
           9999       Feb-19
           Name: CC Exp Date, Length: 10000, dtype: object
```

In [42]:
```python
# first of all split the column and you get year and store a year in a new column.

credit_cardexp_2020 = data[data['CC Exp Date'].str[-2:] == '20']
credit_cardexp_2020
```

Out[42]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email	
0	16629 Pace Camp Apt. 448\nAlexisborough, NE 77...	46 in	PM	Opera/9.56. (X11; Linux x86_64; sl-SI) Presto/2...	Martinez-Herman	6.011930e+15	Feb-20	900	JCB 16 digit	pdunlap@yahoo.com	prod d
19	125 Hall Summit\nBoothton, IL 41721	99 CU	PM	Mozilla/5.0 (compatible; MSIE 7.0; Windows NT ...	Turner-Mckinney	6.763440e+11	Feb-20	440	VISA 16 digit	ruiznicole@gmail.com	inte
32	Unit 3628 Box 6778\nDPO AE 72362	39 Qm	PM	Mozilla/5.0 (Windows 98; Win 9x 4.90) AppleWeb...	Martinez-Wilson	4.942280e+15	Jan-20	8360	JCB 16 digit	shane21@atkinson.com	Civil
36	9374 Skinner Common Apt. 254\nChristopherfort,...	80 Fq	PM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Hanna-Grant	1.800420e+14	Sep-20	912	VISA 16 digit	saundersernest@walsh.com	t
38	9671 Riley Drives Apt. 746\nPort Davidtown, TN...	15 vj	AM	Mozilla/5.0 (X11; Linux i686; rv:1.9.6.20) Gec...	Bryant, Hubbard and Gonzales	2.100950e+14	Dec-20	248	Voyager	djennings@boyd-english.org	Mus
...	...	...	...	...	...	...	...	...	...	...	...
9883	751 Petersen Groves\nLake Rebecca, NM 55875	61 tE	PM	Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_8_7...	Perez and Sons	4.939810e+15	May-20	238	Mastercard	lisa25@hotmail.com	r
9901	908 Norman Burgs\nPhillipsberg, VT 92023-9956	90 Ng	PM	Mozilla/5.0 (compatible; MSIE 9.0;	Hughes Inc	3.014880e+13	Sep-20	483	Voyager	james32@gmail.com	M

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	CC Provider	Email
				Windows NT ...						
9911	44320 Gray Centers Suite 325\nJenniferfurt, OK...	19 Bf	PM	Mozilla/5.0 (X11; Linux i686; rv:1.9.7.20) Gec...	Jones-Gray	4.058070e+12	Dec-20	921	Diners Club / Carte Blanche	hensonlindsay@graves-fox.com
9957	73556 Chase Pine\nBrucemouth, MP 73473	25 rU	PM	Opera/9.49. (Windows 95; en-US) Presto/2.9.189 ...	Martin, Clayton and Jarvis	3.337740e+15	May-20	798	VISA 13 digit	latashaochoa@gmail.com
9992	885 Allen Mountains Apt. 230\nWallhaven, LA 16995	40 vH	PM	Mozilla/5.0 (Macintosh; PPC Mac OS X 10_6_5) A...	Wells Ltd	4.664830e+15	Oct-20	431	Discover	bberry@wright.net

988 rows × 14 columns

In [44]:
```python
# let's count how many people have a credit card that expires in 2020?

len(credit_cardexp_2020)
```

Out[44]:   988