

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

```
In [8]: ecommerce_data=pd.read_csv(r"E:\archive (4)\Ecommerce Purchases")
ecommerce_data
```

Out[8]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	Sec
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	6011929061123406	02/20	
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	3337758169645356	11/18	
2	Unit 0065 Box 5052\nDPO AP 27450	94 vE	PM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Simpson, Williams and Pham	675957666125	08/19	
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	6011578504430710	02/24	
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	6011456623207998	10/25	
...
9995	966 Castaneda Locks\nWest Juliafurt, CO 96415	92 XI	PM	Mozilla/5.0 (Windows NT 5.1) AppleWebKit/5352 ...	Randall- Sloan	342945015358701	03/22	
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	210033169205009	07/25	
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	6011539787356311	05/21	
9998	0096 English Rest\nRoystad, IA 12457	74 cL	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_8;...	Cook Inc	180003348082930	11/17	
9999	40674 Barrett Stravenue\nGrimesville, WI 79682	64 Hr	AM	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	Greene Inc	4139972901927273	02/19	

10000 rows × 14 columns

print the first 5 rows in the dataset

```
In [9]: ecommerce_data.head(n=5)
```

Out[9]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code	Pro
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	6011929061123406	02/20	900	J
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	3337758169645356	11/18	561	Maste
2	Unit 0065 Box 5052\nDPO AP 27450	94 vE	PM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Simpson, Williams and Pham	675957666125	08/19	699	J
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	6011578504430710	02/24	384	Dis
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	6011456623207998	10/25	678	I ' Bl

print the last 10 rows of the dataset

```
In [10]: ecommerce_data.tail(n=10)
```

Out[10]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	Sec
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	869968197049750	04/24	
9991	PSC 8165, Box 8498\nAPO AP 60327-0346	50 dA	AM	Mozilla/5.0 (compatible; MSIE 8.0; Windows NT ...	Snyder Inc	4221582137197481	02/24	
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	4664825258997302	10/20	
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	30025560104631	10/25	
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	3112186784121077	01/25	
9995	966 Castaneda Locks\nWest Juliafurt, CO 96415	92 XI	PM	Mozilla/5.0 (Windows NT 5.1) AppleWebKit/5352 ...	Randall-Sloan	342945015358701	03/22	
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	210033169205009	07/25	
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	6011539787356311	05/21	
9998	0096 English Rest\nRoystad, IA 12457	74 cL	PM	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_8;...	Cook Inc	180003348082930	11/17	
9999	40674 Barrett Stravenue\nGrimesville, WI 79682	64 Hr	AM	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	Greene Inc	4139972901927273	02/19	



In [12]: ecommerce_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  int64
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(1), int64(2), object(11)
memory usage: 1.1+ MB
```

check datatype of each column

```
In [15]: ecommerce_data.dtypes
```

```
Out[15]: Address                object
Lot                    object
AM or PM                object
Browser Info            object
Company                 object
Credit Card             int64
CC Exp Date             object
CC Security Code        int64
CC Provider             object
Email                   object
Job                     object
IP Address              object
Language                 object
Purchase Price          float64
dtype: object
```

check the null values in the dataset

```
In [17]: ecommerce_data.isnull().sum()
```

```
Out[17]: 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 [ ]:
```

how many rows and columns are there in the dataset

```
In [18]: ecommerce_data.shape
```

```
Out[18]: (10000, 14)
```

```
In [19]: len(ecommerce_data)
```

```
Out[19]: 10000
```

```
In [20]: ecommerce_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  int64
 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(1), int64(2), object(11)
memory usage: 1.1+ MB
```

find the highest and lowest purchase

```
In [21]: ecommerce_data.columns
```

```
Out[21]: 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 [23]: ecommerce_data["Purchase Price"].idxmax()
```

```
Out[23]: 2092
```

```
In [25]: ecommerce_data["Purchase Price"].max()
```

```
Out[25]: 99.99
```

```
In [26]: ecommerce_data["Purchase Price"].min()
```

```
Out[26]: 0.0
```

average purchase price

```
In [27]: ecommerce_data["Purchase Price"].mean()
```

```
Out[27]: 50.347302
```

how many people have french as fr in thier language

```
In [28]: ecommerce_data.columns
```

```
Out[28]: 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 [38]: len(ecommerce_data[ecommerce_data["Language"]=="fr"])
```

```
Out[38]: 1097
```

job titles contains engineer

```
In [42]: ecommerce_data[ecommerce_data["Job"].str.contains("engineer", case=False)]
```

Out[42]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	CC Security Code
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	3337758169645356	11/18	561
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	6011578504430710	02/24	384
50	41159 Michael Centers\nAdamsfort, RI 37108-6674	46 Ce	PM	Mozilla/5.0 (Windows 98; Win 9x 4.90; sl-Sl; r...	Wright, Williams and Mendez	4008586485908075	05/19	945
55	27635 Maureen Bypass Apt. 883\nSandrerview, SD ...	59 LJ	AM	Mozilla/5.0 (iPod; U; CPU iPhone OS 3_3 like M...	Sims- Lyons	3158113629128344	09/19	857
60	7126 Katherine Squares\nPerkinsview, CO 97299-...	63 qu	AM	Opera/8.68. (X11; Linux x86_64; en- US) Presto/2...	Marshall- Fernandez	349767747049645	05/20	672
...
9948	95544 Johnson Isle Suite 939\nMichaelberg, RI ...	91 bW	AM	Opera/8.36. (X11; Linux x86_64; sl- SI) Presto/2...	Fox- Peterson	4762924304307	03/17	567
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	6011679271321726	09/19	964
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	6011485664704662	07/19	543
9977	02182 Keith Expressway\nEast Shannon, CT 20578...	34 RL	AM	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	Deleon, Jacobson and Benton	4186094003664688	06/21	397
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	210033169205009	07/25	207

984 rows × 14 columns

```
In [43]: len(ecommerce_data[ecommerce_data["Job"].str.contains("engineer",case=False)])
```

```
Out[43]: 984
```

Find The Email of the person with the following IP Address: 132.207.160.22

```
In [44]: ecommerce_data.columns
```

```
Out[44]: 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 [49]: ecommerce_data[ecommerce_data["IP Address"]=="132.207.160.22"]["Email"]
```

```
Out[49]: 2    amymiller@morales-harrison.com  
Name: Email, dtype: object
```

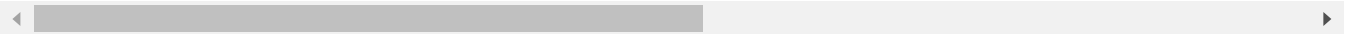
How many People have Mastercard as their Credit Card Provider and made a purchase above 50?

```
In [60]: ecommerce_data[(ecommerce_data["CC Provider"]=="Mastercard") & (ecommerce_data["Purchase Price"]>50)]
```


Out[60]:

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	CC Exp Date	Se
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	3337758169645356	11/18	
18	461 Christopher Square\nWest Michaelchester, C...	17 SB	PM	Mozilla/5.0 (X11; Linux i686; rv:1.9.6.20) Gec...	Beard, Abbott and Pena	6011350184276270	12/22	
31	USNS Alvarado\nFPO AA 27052-1231	26 Lh	PM	Opera/8.84. (X11; Linux i686; sl-SI) Presto/2.9...	Nicholson Group	4614997834548	03/22	
35	93392 Webb Gardens Apt. 220\nLaurabury, AR 999...	37 om	AM	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...	Mora Ltd	6011049630969815	09/16	
90	431 Bowen Lights\nFergusonborough, MH 01362	31 tG	AM	Mozilla/5.0 (Windows NT 5.2; it-IT; rv:1.9.1.2...	Copeland- Lee	639032576097	06/18	
...
9941	43757 Brown Lodge\nValerieberg, PR 88518	68 DG	AM	Mozilla/5.0 (compatible; MSIE 5.0; Windows NT ...	Jones, Williams and Dunn	6011508474487291	04/26	
9948	95544 Johnson Isle Suite 939\nMichaelberg, RI ...	91 bW	AM	Opera/8.36. (X11; Linux x86_64; sl-SI) Presto/2...	Fox- Peterson	4762924304307	03/17	
9954	051 Samantha Wells Apt. 328\nScottborough, OR ...	11 vG	AM	Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_8_2...	Mendoza, Zimmerman and Reilly	30232295374907	05/21	
9981	087 Larson Roads Apt. 587\nRicestad, WI 98077-...	95 Kw	AM	Opera/9.63. (Windows NT 5.01; en-US) Presto/2.9...	Ortiz, Schultz and Adams	4690863684605	01/19	
9987	2754 Klein Mission\nJohnsonview, PA 64925-9624	65 Fg	PM	Opera/9.26. (Windows CE; sl-SI) Presto/2.9.188 ...	Curtis LLC	180027305702263	12/24	

405 rows × 14 columns



In [61]: len(ecommerce_data[(ecommerce_data["CC Provider"]=="Mastercard")& (ecommerce_data["Pu

Out[61]: 405

Find the email of the person with the following Credit Card Number: 4664825258997302

```
In [79]: ecommerce_data[ecommerce_data["Credit Card"]== 4664825258997302]["Email"]
```

```
Out[79]: 9992    bberry@wright.net  
Name: Email, dtype: object
```

How many people purchase during the AM and how many people purchase during PM?

```
In [80]: ecommerce_data.columns
```

```
Out[80]: 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 [86]: len(ecommerce_data[ecommerce_data["AM or PM"]=="AM"])
```

```
Out[86]: 4932
```

```
In [83]: len(ecommerce_data["AM or PM"]=="PM")
```

```
Out[83]: 10000
```

```
In [84]: ecommerce_data['AM or PM'].value_counts()
```

```
Out[84]: PM    5068  
        AM    4932  
        Name: AM or PM, dtype: int64
```

How many people have a credit card that expires in 2020?

```
In [87]: ecommerce_data["CC Exp Date"].value_counts()
```

```
Out[87]: 08/22    108  
        01/26    105  
        04/19    105  
        01/21    104  
        01/19    103  
        ...  
        12/22     67  
        11/25     67  
        10/25     64  
        08/26     48  
        08/16     39  
        Name: CC Exp Date, Length: 121, dtype: int64
```

```
In [96]: def fun():  
         count=0  
         for date in ecommerce_data["CC Exp Date"]:  
             if date.split("/")[1]=="20":  
                 count=count+1  
         print(count)  
         fun()
```

988

In []:

In []:

In []: