

commerce-purchase-project-analysis

November 16, 2024

```
[13]: import pandas as pd
```

```
[14]: data=pd.read_csv('E:\\Sql query\\Ecommerce Purchases1.csv')
data
```

```
[14]:
```

	Address	Lot	AM or PM	\
0	16629 Pace Camp Apt. 448\nAlexisborough, NE 77...	46 in	PM	
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	
2	Unit 0065 Box 5052\nDP0 AP 27450	94 vE	PM	
3	7780 Julia Fords\nNew Stacy, WA 45798	36 vm	PM	
4	23012 Munoz Drive Suite 337\nNew Cynthia, TX 5...	20 IE	AM	
...	
9995	966 Castaneda Locks\nWest Juliafurt, CO 96415	92 XI	PM	
9996	832 Curtis Dam Suite 785\nNorth Edwardburgh, T...	41 JY	AM	
9997	Unit 4434 Box 6343\nDP0 AE 28026-0283	74 Zh	AM	
9998	0096 English Rest\nRoystad, IA 12457	74 cL	PM	
9999	40674 Barrett Stravenue\nGrimesville, WI 79682	64 Hr	AM	

	Browser Info	\
0	Opera/9.56.(X11; Linux x86_64; sl-SI) Presto/2...	
1	Opera/8.93.(Windows 98; Win 9x 4.90; en-US) Pr...	
2	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	
3	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_0 ...	
4	Opera/9.58.(X11; Linux x86_64; it-IT) Presto/2...	
...	...	
9995	Mozilla/5.0 (Windows NT 5.1) AppleWebKit/5352 ...	
9996	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	
9997	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...	
9998	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_8;...	
9999	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	

	Company	Credit Card CC	Exp Date	\
0	Martinez-Herman	6011929061123406	02/20	
1	Fletcher, Richards and Whitaker	3337758169645356	11/18	
2	Simpson, Williams and Pham	675957666125	08/19	
3	Williams, Marshall and Buchanan	6011578504430710	02/24	
4	Brown, Watson and Andrews	6011456623207998	10/25	

...
9995	Randall-Sloan	342945015358701	03/22
9996	Hale, Collins and Wilson	210033169205009	07/25
9997	Anderson Ltd	6011539787356311	05/21
9998	Cook Inc	180003348082930	11/17
9999	Greene Inc	4139972901927273	02/19

	CC Security Code	CC Provider \
0	900	JCB 16 digit
1	561	Mastercard
2	699	JCB 16 digit
3	384	Discover
4	678	Diners Club / Carte Blanche
...
9995	838	JCB 15 digit
9996	207	JCB 16 digit
9997	1	VISA 16 digit
9998	987	American Express
9999	302	JCB 15 digit

	Email	Job \
0	pdunlap@yahoo.com	Scientist, product/process development
1	anthony41@reed.com	Drilling engineer
2	amymiller@morales-harrison.com	Customer service manager
3	brent16@olson-robinson.info	Drilling engineer
4	christopherwright@gmail.com	Fine artist
...
9995	iscott@wade-garner.com	Printmaker
9996	mary85@hotmail.com	Energy engineer
9997	tyler16@gmail.com	Veterinary surgeon
9998	elizabethmoore@reid.net	Local government officer
9999	rachelford@vaughn.com	Embryologist, clinical

	IP Address	Language	Purchase Price
0	149.146.147.205	el	98.14
1	15.160.41.51	fr	70.73
2	132.207.160.22	de	0.95
3	30.250.74.19	es	78.04
4	24.140.33.94	es	77.82
...
9995	29.73.197.114	it	82.21
9996	121.133.168.51	pt	25.63
9997	156.210.0.254	el	83.98
9998	55.78.26.143	es	38.84
9999	176.119.198.199	el	67.59

[10000 rows x 14 columns]

[]:

1- Display top 10 row.

[16]: data.head(10)

```
[16]:
```

	Address	Lot	AM or PM	\
0	16629 Pace Camp Apt. 448\nAlexisborough, NE 77...	46 in	PM	
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	
2	Unit 0065 Box 5052\nDPO AP 27450	94 vE	PM	
3	7780 Julia Fords\nNew Stacy, WA 45798	36 vm	PM	
4	23012 Munoz Drive Suite 337\nNew Cynthia, TX 5...	20 IE	AM	
5	7502 Powell Mission Apt. 768\nTravisland, VA 3...	21 XT	PM	
6	93971 Conway Causeway\nAndersonburgh, AZ 75107	96 Xt	AM	
7	260 Rachel Plains Suite 366\nCastroberg, WV 24...	96 pG	PM	
8	2129 Dylan Burg\nNew Michelle, ME 28650	45 JN	PM	
9	3795 Dawson Extensions\nLake Tinafort, ID 88739	15 Ug	AM	

```
Browser Info \
```

0	Opera/9.56.(X11; Linux x86_64; sl-SI) Presto/2...
1	Opera/8.93.(Windows 98; Win 9x 4.90; en-US) Pr...
2	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...
3	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_0 ...
4	Opera/9.58.(X11; Linux x86_64; it-IT) Presto/2...
5	Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_8_5...
6	Mozilla/5.0 (compatible; MSIE 7.0; Windows NT ...
7	Mozilla/5.0 (X11; Linux i686) AppleWebKit/5350...
8	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...
9	Mozilla/5.0 (X11; Linux i686; rv:1.9.7.20) Gec...

	Company	Credit Card CC	Exp Date	\
0	Martinez-Herman	6011929061123406	02/20	
1	Fletcher, Richards and Whitaker	3337758169645356	11/18	
2	Simpson, Williams and Pham	675957666125	08/19	
3	Williams, Marshall and Buchanan	6011578504430710	02/24	
4	Brown, Watson and Andrews	6011456623207998	10/25	
5	Silva-Anderson	30246185196287	07/25	
6	Gibson and Sons	6011398782655569	07/24	
7	Marshall-Collins	561252141909	06/25	
8	Galloway and Sons	180041795790001	04/24	
9	Rivera, Buchanan and Ramirez	4396283918371	01/17	

	CC Security Code	CC Provider	\
0	900	JCB 16 digit	
1	561	Mastercard	
2	699	JCB 16 digit	
3	384	Discover	

4	678	Diners Club / Carte Blanche
5	7169	Discover
6	714	VISA 16 digit
7	256	VISA 13 digit
8	899	JCB 16 digit
9	931	American Express

	Email	Job \
0	pdunlap@yahoo.com	Scientist, product/process development
1	anthony41@reed.com	Drilling engineer
2	amymiller@morales-harrison.com	Customer service manager
3	brent16@olson-robinson.info	Drilling engineer
4	christopherwright@gmail.com	Fine artist
5	ynguyen@gmail.com	Fish farm manager
6	olivia04@yahoo.com	Dancer
7	phillip48@parks.info	Event organiser
8	kdavis@rasmussen.com	Financial manager
9	qcoleman@hunt-huerta.com	Forensic scientist

	IP Address	Language	Purchase Price
0	149.146.147.205	el	98.14
1	15.160.41.51	fr	70.73
2	132.207.160.22	de	0.95
3	30.250.74.19	es	78.04
4	24.140.33.94	es	77.82
5	55.96.152.147	ru	25.15
6	127.252.144.18	de	88.56
7	224.247.97.150	pt	44.25
8	146.234.201.229	ru	59.54
9	236.198.199.8	zh	95.63

```
[ ]:
```

2- Display Least 10 rows.

```
[23]: data.tail(10)
```

```
[23]:
```

	Address	Lot	AM or PM \
9990	75731 Molly Springs\nWest Danielle, VT 96934-5102	93 ty	PM
9991	PSC 8165, Box 8498\nAPO AP 60327-0346	50 dA	AM
9992	885 Allen Mountains Apt. 230\nWallhaven, LA 16995	40 vH	PM
9993	7555 Larson Locks Suite 229\nEllisburgh, MA 34...	72 jg	PM
9994	6276 Rojas Hollow\nLake Louis, WY 56410-7837	93 Ex	PM
9995	966 Castaneda Locks\nWest Juliafurt, CO 96415	92 XI	PM
9996	832 Curtis Dam Suite 785\nNorth Edwardburgh, T...	41 JY	AM
9997	Unit 4434 Box 6343\nNDPO AE 28026-0283	74 Zh	AM
9998	0096 English Rest\nRoystad, IA 12457	74 cL	PM

9999 40674 Barrett Stravenue\nGrimesville, WI 79682 64 Hr AM

Browser Info \

9990 Mozilla/5.0 (Macintosh; Intel Mac OS X 10_7_4;...
 9991 Mozilla/5.0 (compatible; MSIE 8.0; Windows NT ...
 9992 Mozilla/5.0 (Macintosh; PPC Mac OS X 10_6_5) A...
 9993 Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_8...
 9994 Opera/9.68.(X11; Linux x86_64; sl-SI) Presto/2...
 9995 Mozilla/5.0 (Windows NT 5.1) AppleWebKit/5352 ...
 9996 Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...
 9997 Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...
 9998 Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_8;...
 9999 Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...

	Company	Credit Card	CC Exp Date	\
9990	Pace, Vazquez and Richards	869968197049750	04/24	
9991	Snyder Inc	4221582137197481	02/24	
9992	Wells Ltd	4664825258997302	10/20	
9993	Colon and Sons	30025560104631	10/25	
9994	Ritter-Smith	3112186784121077	01/25	
9995	Randall-Sloan	342945015358701	03/22	
9996	Hale, Collins and Wilson	210033169205009	07/25	
9997	Anderson Ltd	6011539787356311	05/21	
9998	Cook Inc	180003348082930	11/17	
9999	Greene Inc	4139972901927273	02/19	

	CC Security Code	CC Provider	Email	\
9990	877	JCB 15 digit	andersonmichael@sherman.biz	
9991	969	Voyager	kking@wise-liu.com	
9992	431	Discover	bberry@wright.net	
9993	629	Maestro	chelseawilliams@lopez.biz	
9994	1823	Maestro	iroberts@gmail.com	
9995	838	JCB 15 digit	iscott@wade-garner.com	
9996	207	JCB 16 digit	mary85@hotmail.com	
9997	1	VISA 16 digit	tyler16@gmail.com	
9998	987	American Express	elizabethmoore@reid.net	
9999	302	JCB 15 digit	rachelford@vaughn.com	

	Job	IP Address	Language	Purchase Price
9990	Early years teacher	54.170.3.185	ru	18.35
9991	IT sales professional	254.25.31.156	el	25.93
9992	Set designer	174.173.51.32	de	67.96
9993	Designer, exhibition/display	177.46.82.128	el	65.61
9994	Education officer, museum	242.44.112.18	zh	31.85
9995	Printmaker	29.73.197.114	it	82.21
9996	Energy engineer	121.133.168.51	pt	25.63
9997	Veterinary surgeon	156.210.0.254	el	83.98

9998	Local government officer	55.78.26.143	es	38.84
9999	Embryologist, clinical	176.119.198.199	el	67.59

[]:

3- Check datatype of each columns.

[29]: data.dtypes

```
[29]: 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
```

[]:

4- Check Null values.

[33]: data.isnull()

```
[33]:
```

	Address	Lot	AM or PM	Browser Info	Company	Credit Card	\
0	False	False	False	False	False	False	
1	False	False	False	False	False	False	
2	False	False	False	False	False	False	
3	False	False	False	False	False	False	
4	False	False	False	False	False	False	
...	
9995	False	False	False	False	False	False	
9996	False	False	False	False	False	False	
9997	False	False	False	False	False	False	
9998	False	False	False	False	False	False	
9999	False	False	False	False	False	False	

	CC Exp Date	CC Security Code	CC Provider	Email	Job	IP Address	\
0	False	False	False	False	False	False	
1	False	False	False	False	False	False	
2	False	False	False	False	False	False	

3	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False
...
9995	False	False	False	False	False	False	False
9996	False	False	False	False	False	False	False
9997	False	False	False	False	False	False	False
9998	False	False	False	False	False	False	False
9999	False	False	False	False	False	False	False

	Language	Purchase Price
0	False	False
1	False	False
2	False	False
3	False	False
4	False	False
...
9995	False	False
9996	False	False
9997	False	False
9998	False	False
9999	False	False

[10000 rows x 14 columns]

```
[37]: data.isnull().sum()
```

```
[37]: 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
```

```
[ ]:
```

5- Display no of Rows and no of Columns.

```
[40]: data.columns
```

```
[40]: 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')
```

```
[42]: # no of columns
      len(data.columns)
```

```
[42]: 14
```

```
[44]: #no of rows
      len(data)
```

```
[44]: 10000
```

```
[46]: 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
```

```
[ ]:
```

6- Display Highest, Lowest purchase and average purchase.

```
[50]: data.columns
```

```
[50]: 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')
```



```
dtype='object')
```

```
[52]: data['Purchase Price'].max()
```

```
[52]: 99.99
```

```
[54]: data['Purchase Price'].min()
```

```
[54]: 0.0
```

```
[60]: data['Purchase Price'].mean()
```

```
[60]: 50.347302
```

7- How many people have french 'fr' language.

```
[62]: data.columns
```

```
[62]: 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')
```

```
[64]: data['Language']=='fr'
```

```
[64]: 0      False  
      1      True  
      2     False  
      3     False  
      4     False  
      ...  
     9995    False  
     9996    False  
     9997    False  
     9998    False  
     9999    False  
      Name: Language, Length: 10000, dtype: bool
```

```
[66]: data[data['Language']=='fr']
```

```
[66]:
```

	Address	Lot	AM or PM	\
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	
19	125 Hall Summit\nBoothton, IL 41721	99 CU	PM	
53	PSC 9431, Box 7059\nAPO AA 29285-1363	14 qD	AM	
76	49206 Campbell Port\nNorth Cliffordshire, HI 3...	71 iu	PM	
82	493 Smith Valleys Suite 004\nNew Madelineville...	35 ls	PM	
...	

9941	43757 Brown Lodge\nValerieberg, PR 88518	68 DG	AM
9947	32827 Carl Inlet\nSouth Nicole, NY 38081-6636	40 Dp	PM
9951	518 Brown Dam\nGarciaside, IN 33057	71 wq	AM
9977	02182 Keith Expressway\nEast Shannon, CT 20578...	34 RL	AM
9980	6061 Dave Lights\nPhillipsview, UT 40500	25 Mv	AM

Browser Info \

1	Opera/8.93.(Windows 98; Win 9x 4.90; en-US) Pr...
19	Mozilla/5.0 (compatible; MSIE 7.0; Windows NT ...
53	Opera/9.34.(X11; Linux x86_64; it-IT) Presto/2...
76	Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_5_9...
82	Mozilla/5.0 (iPod; U; CPU iPhone OS 4_0 like M...
...	...
9941	Mozilla/5.0 (compatible; MSIE 5.0; Windows NT ...
9947	Mozilla/5.0 (Windows; U; Windows 95) AppleWebKit...
9951	Mozilla/5.0 (compatible; MSIE 8.0; Windows NT ...
9977	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...
9980	Opera/8.58.(Windows NT 5.0; it-IT) Presto/2.9...

	Company	Credit Card CC	Exp Date \
1	Fletcher, Richards and Whitaker	3337758169645356	11/18
19	Turner-Mckinney	676343504830	02/20
53	Higgins, Cardenas and Kennedy	869972604798355	08/17
76	Jacobs-Tucker	6011343518820988	01/17
82	Robinson, Johnston and Valdez	4351359627548412	06/17
...
9941	Jones, Williams and Dunn	6011508474487291	04/26
9947	Pruitt-Flores	3158564208754951	03/17
9951	Crosby, Vasquez and Ballard	5256758441931287	12/17
9977	Deleon, Jacobson and Benton	4186094003664688	06/21
9980	Cortez-Frye	6011944199756993	12/24

	CC Security Code	CC Provider	Email \
1	561	Mastercard	anthony41@reed.com
19	440	VISA 16 digit	ruiznicole@gmail.com
53	157	JCB 16 digit	amorales@yahoo.com
76	806	Voyager	eperez@hotmail.com
82	937	VISA 13 digit	amendez@yahoo.com
...
9941	906	Mastercard	christian55@gmail.com
9947	386	Mastercard	josephsmith@gmail.com
9951	146	VISA 16 digit	cjennings@yahoo.com
9977	397	JCB 16 digit	daltoncarter@yahoo.com
9980	755	JCB 15 digit	mark74@kirby-stewart.org

	Job	IP Address	Language \
1	Drilling engineer	15.160.41.51	fr

19	Designer, interior/spatial	25.105.209.214	fr
53	Technical author	44.108.117.122	fr
76	Paramedic	210.207.58.168	fr
82	Engineer, materials	163.129.163.100	fr
...
9941	Secondary school teacher	216.118.235.145	fr
9947	Textile designer	198.68.38.23	fr
9951	Lighting technician, broadcasting/film/video	58.12.83.1	fr
9977	Biomedical engineer	146.238.118.2	fr
9980	Textile designer	110.103.77.195	fr

	Purchase Price
1	70.73
19	58.39
53	10.41
76	57.34
82	49.04
...	...
9941	60.03
9947	49.61
9951	57.59
9977	94.93
9980	16.05

[1097 rows x 14 columns]

```
[68]: len(data[data['Language']=='fr'])
```

```
[68]: 1097
```

```
[70]: data[data['Language']=='fr'].count()
```

```
[70]: 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
```

```
[ ]:
```

8- find all job title engineer.

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

```
[72]: 0      False
      1      True
      2      False
      3      True
      4      False
      ...
     9995     False
     9996      True
     9997     False
     9998     False
     9999     False
      Name: Job, Length: 10000, dtype: bool
```

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

```
[74]:
```

	Address	Lot	AM or PM	\
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	
3	7780 Julia Fords\nNew Stacy, WA 45798	36 vm	PM	
50	41159 Michael Centers\nAdamsfort, RI 37108-6674	46 Ce	PM	
55	27635 Maureen Bypass Apt. 883\nSandrerview, SD ...	59 LJ	AM	
60	7126 Katherine Squares\nPerkinsview, CO 97299-...	63 qu	AM	
...	
9948	95544 Johnson Isle Suite 939\nMichaelberg, RI ...	91 bW	AM	
9952	9991 Vaughn Hills\nRacheltown, PA 55409	36 KC	PM	
9970	0060 Keith Stream\nWestport, CO 47097	11 nt	PM	
9977	02182 Keith Expressway\nEast Shannon, CT 20578...	34 RL	AM	
9996	832 Curtis Dam Suite 785\nNorth Edwardburgh, T...	41 JY	AM	

	Browser Info	\
1	Opera/8.93.(Windows 98; Win 9x 4.90; en-US) Pr...	
3	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_0 ...	
50	Mozilla/5.0 (Windows 98; Win 9x 4.90; sl-SI; r...	
55	Mozilla/5.0 (iPod; U; CPU iPhone OS 3_3 like M...	
60	Opera/8.68.(X11; Linux x86_64; en-US) Presto/2...	
...	...	
9948	Opera/8.36.(X11; Linux x86_64; sl-SI) Presto/2...	
9952	Mozilla/5.0 (X11; Linux i686; rv:1.9.5.20) Gec...	
9970	Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_8...	
9977	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	
9996	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	

	Company	Credit Card	CC Exp Date	\
1	Fletcher, Richards and Whitaker	3337758169645356	11/18	
3	Williams, Marshall and Buchanan	6011578504430710	02/24	
50	Wright, Williams and Mendez	4008586485908075	05/19	
55	Sims-Lyons	3158113629128344	09/19	
60	Marshall-Fernandez	349767747049645	05/20	
...	
9948	Fox-Peterson	4762924304307	03/17	
9952	Ward, Smith and Castillo	6011679271321726	09/19	
9970	Carpenter, Good and Hart	6011485664704662	07/19	
9977	Deleon, Jacobson and Benton	4186094003664688	06/21	
9996	Hale, Collins and Wilson	210033169205009	07/25	

	CC Security Code	CC Provider	Email	\
1	561	Mastercard	anthony41@reed.com	
3	384	Discover	brent16@olson-robinson.info	
50	945	JCB 16 digit	susanvalentine@obrien.org	
55	857	VISA 16 digit	adkinsarthur@yahoo.com	
60	672	JCB 15 digit	sweeneyhannah@jones.biz	
...	
9948	567	Mastercard	haleybenjamin@gmail.com	
9952	964	Voyager	jonesjennifer@olson.com	
9970	543	Discover	rangelbrian@hotmail.com	
9977	397	JCB 16 digit	daltoncarter@yahoo.com	
9996	207	JCB 16 digit	mary85@hotmail.com	

	Job	IP Address	Language	\
1	Drilling engineer	15.160.41.51	fr	
3	Drilling engineer	30.250.74.19	es	
50	Mechanical engineer	213.203.143.215	de	
55	Engineer, broadcasting (operations)	227.235.89.210	pt	
60	Engineer, agricultural	197.144.142.102	de	
...	
9948	Structural engineer	120.36.140.58	en	
9952	Engineer, energy	116.228.12.42	es	
9970	Electrical engineer	242.8.85.205	en	
9977	Biomedical engineer	146.238.118.2	fr	
9996	Energy engineer	121.133.168.51	pt	

	Purchase Price
1	70.73
3	78.04
50	36.85
55	48.74
60	20.43
...	...
9948	71.89

```

9952          39.63
9970          17.76
9977          94.93
9996          25.63

```

[984 rows x 14 columns]

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

```
[76]: 984
```

```
[ ]:
```

9- Find Email of the person with following IP Address : 132.207.160.22

```
[87]: data.columns
```

```
[87]: 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')
```

```
[97]: data[data['IP Address']=='132.207.160.22']['Email']
```

```
[97]: 2      amymiller@morales-harrison.com
      Name: Email, dtype: object
```

```
[ ]:
```

10- display that how many people have Master card as their cc provider and made a purchase above 50

```
[104]: data[(data['CC Provider']=='Mastercard') & (data['Purchase Price']>50 )]
```

```
[104]:
```

	Address	Lot	AM or PM	\
1	9374 Jasmine Spurs Suite 508\nSouth John, TN 8...	28 rn	PM	
18	461 Christopher Square\nWest Michaelchester, C...	17 SB	PM	
31	USNS Alvarado\nFPO AA 27052-1231	26 Lh	PM	
35	93392 Webb Gardens Apt. 220\nLaurabury, AR 999...	37 om	AM	
90	431 Bowen Lights\nFergusonborough, MH 01362	31 tG	AM	
...	
9941	43757 Brown Lodge\nValerieberg, PR 88518	68 DG	AM	
9948	95544 Johnson Isle Suite 939\nMichaelberg, RI ...	91 bW	AM	
9954	051 Samantha Wells Apt. 328\nScottborough, OR ...	11 vG	AM	
9981	087 Larson Roads Apt. 587\nRicestad, WI 98077-...	95 Kw	AM	
9987	2754 Klein Mission\nJohnsonview, PA 64925-9624	65 Fg	PM	

Browser Info \

1 Opera/8.93.(Windows 98; Win 9x 4.90; en-US) Pr...

18 Mozilla/5.0 (X11; Linux i686; rv:1.9.6.20) Gec...

31 Opera/8.84.(X11; Linux i686; sl-SI) Presto/2.9...

35 Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_7...

90 Mozilla/5.0 (Windows NT 5.2; it-IT; rv:1.9.1.2...

...

9941 Mozilla/5.0 (compatible; MSIE 5.0; Windows NT ...

9948 Opera/8.36.(X11; Linux x86_64; sl-SI) Presto/2...

9954 Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_8_2...

9981 Opera/9.63.(Windows NT 5.01; en-US) Presto/2.9...

9987 Opera/9.26.(Windows CE; sl-SI) Presto/2.9.188 ...

	Company	Credit Card CC	Exp Date \
1	Fletcher, Richards and Whitaker	3337758169645356	11/18
18	Beard, Abbott and Pena	6011350184276270	12/22
31	Nicholson Group	4614997834548	03/22
35	Mora Ltd	6011049630969815	09/16
90	Copeland-Lee	639032576097	06/18
...
9941	Jones, Williams and Dunn	6011508474487291	04/26
9948	Fox-Peterson	4762924304307	03/17
9954	Mendoza, Zimmerman and Reilly	30232295374907	05/21
9981	Ortiz, Schultz and Adams	4690863684605	01/19
9987	Curtis LLC	180027305702263	12/24

	CC Security Code	CC Provider	Email \
1	561	Mastercard	anthony41@reed.com
18	767	Mastercard	hannah63@yahoo.com
31	909	Mastercard	ashley12@hotmail.com
35	367	Mastercard	hgonzalez@mcdowell.com
90	868	Mastercard	nrogers@brown.com
...
9941	906	Mastercard	christian55@gmail.com
9948	567	Mastercard	haleybenjamin@gmail.com
9954	762	Mastercard	brownamy@perkins.com
9981	695	Mastercard	laurenbennett@richards.com
9987	865	Mastercard	denisehamilton@novak.biz

	Job	IP Address	Language \
1	Drilling engineer	15.160.41.51	fr
18	Photographer	73.250.176.201	el
31	Sales executive	94.176.142.201	en
35	Lecturer, further education	216.23.95.40	zh
90	Teacher, English as a foreign language	153.188.13.203	es
...
9941	Secondary school teacher	216.118.235.145	fr
9948	Structural engineer	120.36.140.58	en

9954	Presenter, broadcasting	61.97.84.101	it
9981	Environmental education officer	106.21.237.73	pt
9987	Primary school teacher	164.39.190.217	es

	Purchase Price
1	70.73
18	70.15
31	94.14
35	97.46
90	78.86
...	...
9941	60.03
9948	71.89
9954	87.15
9981	63.61
9987	60.83

[405 rows x 14 columns]

[]:

11- find email of following person whose credit card id:4664825258997302

[109]: data.columns

[109]: 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')

[113]: data[data['Credit Card']=='4664825258997302']['Email']

[113]: Series([], Name: Email, dtype: object)

[]:

12- How many people purchase during AM an PM

[116]: data['AM or PM'].value_counts()

[116]: AM or PM
PM 5068
AM 4932
Name: count, dtype: int64

[]:

13- How many people have credit card that have expire in 2020


```
[121]: data[data['CC Exp Date'].apply(lambda x:x[3:]=='20')]
```

```
[121]:
```

	Address	Lot	AM or PM	\
0	16629 Pace Camp Apt. 448\nAlexisborough, NE 77...	46 in	PM	
19	125 Hall Summit\nBoothton, IL 41721	99 CU	PM	
32	Unit 3628 Box 6778\nDPO AE 72362	39 Qm	PM	
36	9374 Skinner Common Apt. 254\nChristopherfort,...	80 Fq	PM	
38	9671 Riley Drives Apt. 746\nPort Davidtown, TN...	15 vj	AM	
...		
9883	751 Petersen Groves\nLake Rebecca, NM 55875	61 tE	PM	
9901	908 Norman Burgs\nPhillipsberg, VT 92023-9956	90 Ng	PM	
9911	44320 Gray Centers Suite 325\nJenniferfurt, OK...	19 Bf	PM	
9957	73556 Chase Pine\nBrucemouth, MP 73473	25 rU	PM	
9992	885 Allen Mountains Apt. 230\nWallhaven, LA 16995	40 vH	PM	

	Browser Info	\
0	Opera/9.56.(X11; Linux x86_64; sl-SI) Presto/2...	
19	Mozilla/5.0 (compatible; MSIE 7.0; Windows NT ...	
32	Mozilla/5.0 (Windows 98; Win 9x 4.90) AppleWeb...	
36	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	
38	Mozilla/5.0 (X11; Linux i686; rv:1.9.6.20) Gec...	
...	...	
9883	Mozilla/5.0 (Macintosh; U; PPC Mac OS X 10_8_7...	
9901	Mozilla/5.0 (compatible; MSIE 9.0; Windows NT ...	
9911	Mozilla/5.0 (X11; Linux i686; rv:1.9.7.20) Gec...	
9957	Opera/9.49.(Windows 95; en-US) Presto/2.9.189 ...	
9992	Mozilla/5.0 (Macintosh; PPC Mac OS X 10_6_5) A...	

	Company	Credit Card	CC Exp Date	\
0	Martinez-Herman	6011929061123406	02/20	
19	Turner-Mckinney	676343504830	02/20	
32	Martinez-Wilson	4942281854569455	01/20	
36	Hanna-Grant	180042289507877	09/20	
38	Bryant, Hubbard and Gonzales	210094965373094	12/20	
...	
9883	Perez and Sons	4939814860063025	05/20	
9901	Hughes Inc	30148833294789	09/20	
9911	Jones-Gray	4058074716188	12/20	
9957	Martin, Clayton and Jarvis	3337737293232646	05/20	
9992	Wells Ltd	4664825258997302	10/20	

	CC Security Code	CC Provider	\
0	900	JCB 16 digit	
19	440	VISA 16 digit	
32	8360	JCB 16 digit	
36	912	VISA 16 digit	
38	248	Voyager	

...
9883	238	Mastercard
9901	483	Voyager
9911	921	Diners Club / Carte Blanche
9957	798	VISA 13 digit
9992	431	Discover

	Email	Job \
0	pdunlap@yahoo.com	Scientist, product/process development
19	ruiznicole@gmail.com	Designer, interior/spatial
32	shane21@atkinson.com	Civil Service fast streamer
36	saundersernest@walsh.com	Animal technologist
38	djennings@boyd-english.org	Music therapist
...
9883	lisa25@hotmail.com	Therapeutic radiographer
9901	james32@gmail.com	Meteorologist
9911	hensonlindsay@graves-fox.com	Optician, dispensing
9957	latashaochoa@gmail.com	Therapeutic radiographer
9992	bberry@wright.net	Set designer

	IP Address	Language	Purchase Price
0	149.146.147.205	el	98.14
19	25.105.209.214	fr	58.39
32	196.37.134.217	pt	56.63
36	85.134.58.250	zh	9.77
38	143.138.65.219	en	30.07
...
9883	215.85.159.70	pt	67.47
9901	250.66.85.29	en	57.25
9911	84.118.30.56	en	20.63
9957	239.219.241.162	ru	71.85
9992	174.173.51.32	de	67.96

[988 rows x 14 columns]

```
[123]: len(data[data['CC Exp Date'].apply(lambda x:x[3:]=='20')])
```

```
[123]: 988
```

14- top 5 most popular email provider.

```
[130]: data['Email'].apply(lambda x:x.split('@')[1]).value_counts().head()
```

```
[130]: Email
hotmail.com    1638
yahoo.com      1616
gmail.com      1605
```

```
smith.com      42
williams.com   37
Name: count, dtype: int64
```

```
[ ]:
```