

e-commerce-purchase-analysis

November 2, 2024

1. IMPORTING LIBRARIES

```
[17]: import numpy as np
import pandas as pd
```

2. IMPORTING THE DATA SETS

```
[18]: data = pd.read_csv(r"H:\DA. Python\10. E-Commerce Purchase Analysis\Ecommerce_
↳Purchases")
```

3. CHECKING DATA

```
[19]: data
```

```
[19]:
```

	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	
...	
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\nDPO 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]

```
[20]: data.shape
```

```
[20]: (10000, 14)
```

4. DISPLAY TOP 10 ROWS OF DATASET

```
[21]: data.head(10)
```

```
[21]:
```

	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

5. DISPLAY BOTTOM 10 ROWS OF DATASET

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

```
[22]:
```

	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\nDPO 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

5. CHECK DATA TYPE OF EACH COLUMN

```
[23]: data.dtypes
```

```
[23]: 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
```

6. CHECK NULL VALUES OF THE DATASET

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

```
[24]: 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

```
[25]: 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. HIGHEST AND LOWEST PURCHASE PRICE

```
[26]: data.columns
```

```
[26]: 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')
```

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

```
[29]: np.float64(99.99)
```

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

```
[30]: np.float64(0.0)
```

7. AVERAGE PURCHASE PRICE

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

```
[31]: np.float64(50.347302)
```

8. HOW MANY PEOPLE HAVE FRENCH fr AS THERE LANGUAGE?

```
[32]: data.columns
```

```
[32]: 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')
```

```
[34]: data[data['Language'] == "fr"]
```

```
[34]:
```

	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) AppleWebK...	
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]

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

```
[37]: 1097
```

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

```
[38]: 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
```

9. JOB TITLE CONTAINS ENGINEER

```
[39]: data.columns
```

```
[39]: 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')
```

```
[46]: data['Job'].str.contains('engineer')
```

```
[46]: 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
```

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

```
[49]: 984
```

10. Find email of the person with the following ip address: 132.207.160.22

```
[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')
```

```
[55]: data[data['IP Address'] == "132.207.160.22"]['Email']
```

```
[55]: 2    amymiller@morales-harrison.com  
      Name: Email, dtype: object
```

11. HOW MANY PEOPLE HAVE MASTERCARD AS THEIR CREDIT CARD PROVIDER AND MADE A PURCHASE ABOVE 50?

```
[58]: data.columns
```

```
[58]: 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')
```

```
[63]: data.head(5)
```

```
[63]:
```

	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

```
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...

```
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

```
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

	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

	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

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

```
[65]: 405
```

12. FIND THE EMAIL OF THE PERSON WITH THE FOLLOWING CREDIT CARD NUMBER: 4664825258997302

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

```
[71]: 9992    bberry@wright.net
      Name: Email, dtype: object
```

13. HOW MANY PEOPLE PURCHASE DURING AM AND HOW MANY PEOPLE PURCHASE DURING PM?

```
[72]: data.columns
```

```
[72]: 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')
```

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

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

14. HOW MANY PEOPLE HAVE A CREDIT CARD THAT EXPIRES IN 2020?

```
[77]: data.columns
```

```
[77]: 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')
```

```
[78]: data.head()
```

```
[78]:
```

	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

	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...	

	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	

	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	

	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	

	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

```
[80]: data['CC Exp Date']
```

```
[80]: 0      02/20
      1      11/18
      2      08/19
      3      02/24
      4      10/25
      ...
      9995    03/22
      9996    07/25
      9997    05/21
      9998    11/17
      9999    02/19
      Name: CC Exp Date, Length: 10000, dtype: object
```

```
[81]: def fun():
      count = 0
      for date in data['CC Exp Date']:
          if date.split('/')[1]=='20':
              count = count + 1
      print(count)
```

```
[82]: fun()
```

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15. TOP 5 MOST POPULAR EMAIL PROVIDERS.

```
[84]: data.columns
```

```
[84]: 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')
```

```
[85]: list1 = []
      for email in data['Email']:
          list1.append(email.split('@')[1])
```

```
[87]: data['Temp'] = list1
```

```
[90]: data['Temp'].value_counts().head()
```

```
[90]: Temp
      hotmail.com      1638
      yahoo.com        1616
      gmail.com        1605
      smith.com         42
      williams.com      37
      Name: count, dtype: int64
```