

▼ Seatwork 6.1 Exploratory Data Analysis on Your Own Dataset

CPE311 Computational Thinking with Python

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Section: CPE22S3

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Submitted to: Engr. Roman M. Richard

```
filepath = '/content/chocolate.csv'
#Importing both numpy,panda
import numpy as np
import pandas as pd
```

```
choc = pd.read_csv(filepath)
choc
```

	ref	company_manufacturer	company_location	review_date	country_of_bean_origin	specific_bean_origin_or_bar_name	cocoa_percent	ingredients	most_memorable_ch
0	2454	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	3- B,S,C	rich co
1	2458	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	3- B,S,C	coco
2	2454	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	3- B,S,C	cocoa, bla
3	2542	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	3- B,S,C	ch
4	2546	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	3- B,S,C	fatty, earthy, m
...	
2525	1205	Zotter	Austria	2014	Blend	Raw	80%	4- B,S*,C,Sa	waxy
2526	1996	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	3- B,S,C	strong nut
2527	2036	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	3- B,S,C	fa
2528	2170	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	3- B,S,C	fatty, mi
2529	2170	Zotter	Austria	2018	Belize	Maya Mtn	72%	3- B,S,C	muted, r

2530 rows × 10 columns

Next steps: [View recommended plots](#)

```
#Printing Columns of data
choc.columns
```

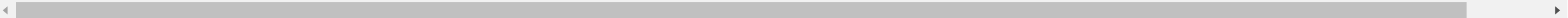
```
Index(['ref', 'company_manufacturer', 'company_location', 'review_date',
      'country_of_bean_origin', 'specific_bean_origin_or_bar_name',
      'cocoa_percent', 'ingredients', 'most_memorable_characteristics',
      'rating'],
      dtype='object')
```

```
#Removing the ref column
choc.drop(['ref'], axis = 1 , inplace=True)
choc.drop(['ingredients'], axis = 1, inplace=True)
```

choc

	company_manufacturer	company_location	review_date	country_of_bean_origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3
...
2525	Zotter	Austria	2014	Blend	Raw	80%	waxy, cloying, vegetal	2
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3

2530 rows × 8 columns



Next steps:



 [View recommended plots](#)

```
#Renaming/shorten the name of company_location to Company
choc.rename(columns = {'company_location': 'Company'}, inplace = True)
choc
```

	company_manufacturer	Company	review_date	country_of_bean_origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	
...	
2525	Zotter	Austria	2014	Blend	Raw	80%	waxy, cloying, vegetal	2.75	
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	
2530 rows × 8 columns									

Next steps: [View recommended plots](#)

```
#Renaming/shorten the name of country of bean origin
choc.rename(columns = {'country_of_bean_origin': 'Bean_Origin'}, inplace = True)
choc
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	
...	
2525	Zotter	Austria	2014	Blend	Raw	80%	waxy, cloying, vegetal	2.75	
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	
2530 rows × 8 columns									

Next steps: [View recommended plots](#)

```
##All chocolate with the rating of 1
rate2 = choc[choc['rating'] == 1].copy()
rate2
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating
430	Callebaut	Belgium	2007	Ecuador	Baking	70%	bitter, cocoa	1.0
590	Claudio Corallo	Sao Tome	2008	Blend	Principe, Sao Tome & Principe	100%	chalky, musty, very bitter	1.0
632	Cote d' Or (Kraft)	Belgium	2006	Blend	Sensations Intense	70%	this is not chocolate	1.0
1679	Neuhaus (Callebaut)	Belgium	2007	Blend	Dark	73%	pastey, strong off flavor	1.0



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```
##All chocolate ratings above 3
rate3 = choc[choc['rating'] >= 3].copy()
rate3
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	category
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	Average
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	Average
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	Average
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	Average
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	Average
...
2524	Zotter	Austria	2012	Dominican Republic	Santo Domingo	70%	strawberry, Cadbury egg	3.75	Average
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	Average
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	Average
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	Average
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	Average





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```
##All chocolate ratings with 4 and above rating
best = choc[choc['rating'] >= 4].copy()
best
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
18	A. Morin	France	2013	Venezuela	Chuao	70%	oily, nut, caramel, raspberry	4.0	
19	A. Morin	France	2013	Peru	Chanchamayo Province	63%	sweet, cocoa, tangerine	4.0	
24	A. Morin	France	2014	Peru	Pablino	70%	delicate, hazelnut, brownie	4.0	
32	A. Morin	France	2021	Mexico	La Joya	70%	light color, fruit, yogurt	4.0	
79	Amano	U.S.A.	2010	Ecuador	Guayas	70%	strong spice, intense pepper	4.0	
...	
2394	Valrhona	France	2011	Venezuela	Porcelana, Pedegral	64%	creamy, honey,peanut butter	4.0	
2395	Valrhona	France	2012	Venezuela	Otucan, Grand Cru	69%	green,unripened fruit,banana	4.0	
2398	Valrhona	France	2015	Peru	Piura, Illanka, Quemazon	63%	intense, dark berry, grapes	4.0	
2459	Willie's Cacao	U.K.	2016	Colombia	Los Llanos	70%	rich cocoa, spicy, cinamon	4.0	
2467	Woodblock	U.S.A.	2011	Venezuela	Ocumare	70%	nutty, tart, coffee	4.0	
112 rows × 8 columns									

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```
#All chocolates under U.S.A. Company
USA = choc[choc['Company'] == 'U.S.A.'].copy()
USA
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	
...	
2489	Zak's	U.S.A.	2015	Blend	House Blend, Batch 2	60%	very sweet, heavy roast, nuts	3.00	
2490	Zak's	U.S.A.	2015	Dominican Republic	Dominican Republic, Batch D2	70%	nutty, earthy, hammy	3.25	
2491	Zak's	U.S.A.	2015	Madagascar	Madagascar, Batch 2	70%	sandy, mild sour, mild fruit	3.25	
2492	Zak's	U.S.A.	2015	Peru	Peru, Batch 1	70%	sandy, nutty, mocha	3.25	
2493	Zak's	U.S.A.	2015	Belize	Belize, Batch 2	70%	rich base cocoa, sweet	3.50	
1136 rows × 8 columns									

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```
#All rating of less than or equal to 3
us4 = USA[USA['rating'] <= 3].copy()
us4
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00
61	Altus aka Cao Artisan	U.S.A.	2013	Venezuela	Sur del Lago	60%	sweet, moldy, off	2.50
62	Altus aka Cao Artisan	U.S.A.	2013	Dominican Republic	Conacado, batch 130	60%	sandy, sweet, dairy, spice	3.00
63	Altus aka Cao Artisan	U.S.A.	2013	Bolivia	Bolivia, batch 154	60%	grit, sweet, caramel, fruit	3.00
...
2482	Xocolla	U.S.A.	2017	Dominican Republic	Hispaniola, batch 170104	70%	spciy, cardamom, off flavor	2.50
2483	Xocolla	U.S.A.	2017	Madagascar	Sambirano, batch 170102	70%	sour milk, molasses, sweet	2.75
2487	Zacharias	U.S.A.	2021	Bolivia	Tranquilidad, wild Bolivia	70%	sweet, tart, sour	3.00
2488	Zak's	U.S.A.	2015	Papua New Guinea	Papua New Guinea, Batch 2	70%	heavy smoke, fruit, ham	3.00
2489	Zak's	U.S.A.	2015	Blend	House Blend, Batch 2	60%	very sweet, heavy roast, nuts	3.00

496 rows × 8 columns



Next steps: [View recommended plots](#)

```
#Mean, Median, Standard Deviation, Max, Min of the chocolate ratings in USA
usmean = np.mean(USA['rating']).copy()
usmed = np.median(USA['rating']).copy()
ustd = np.std(USA['rating']).copy()
usmin = np.min(USA['rating']).copy()
usmax = np.max(USA['rating']).copy()
```

```
print("The mean for the chocolate rating in USA is: ",usmean)
print("The median for the chocolate rating in USA is: ",usmed)
print("The Standard Deviation for the chocolate rating in USA is: ",ustd)
print("The Minimum for the chocolate rating in USA is: ",usmin)
print("The Maximum for the chocolate rating in USA is: ",usmax)
```

```
The mean for the chocolate rating in USA is:  3.190801056338028
The median for the chocolate rating in USA is:  3.25
The Standard Deviation for the chocolate rating in USA is:  0.42410984974033733
The Minimum for the chocolate rating in USA is:  1.5
The Maximum for the chocolate rating in USA is:  4.0
```

```
#Printing all Japan chocolate listed in the data
JP = choc[choc['Company'] == 'Japan'].copy()
JP
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
416	Cacao Store	Japan	2015	Madagascar	Madagascar	70%	sour milk, off, late tart	3.00	
417	Cacao Store	Japan	2015	Peru	Peru	70%	dried fruit, sour, nutella	3.25	
418	Cacao Store	Japan	2015	Vietnam	Vietnam	70%	balanced, dairy, spicy	3.50	
551	ChocoReko	Japan	2015	Venezuela	Patanemo	77%	coarse, vegetal, nibby	3.00	
846	Emily's	Japan	2015	Venezuela	Patanemo	79%	coarse, woody, roasty	3.00	
847	Emily's	Japan	2015	Peru	Peru	78%	brownine, nutty	3.50	
1072	Green Bean to Bar	Japan	2016	Madagascar	Madagascar	70%	rich, coffee, cherry	3.50	
1073	Green Bean to Bar	Japan	2019	Peru	Nativo Blanco	73%	sour grapes, pungent, ashey	2.50	
1319	La Chocolaterie Nanairo	Japan	2016	Peru	Lumas, 2015 Harvest, Batch 6, brown sugar	70%	molasses, cardboard, off note	2.25	
1320	La Chocolaterie Nanairo	Japan	2016	Peru	Lumas, 2015 Harvest, Batch 7	70%	metallic, cardboard, fruit	2.50	
1321	La Chocolaterie Nanairo	Japan	2016	Belize	Belize, 2014 Harvest, Batch 9	70%	nutty, fatty	3.00	
1322	La Chocolaterie Nanairo	Japan	2016	Peru	Tumbes, 2013 Harvest, Batch 8	70%	grit, earthy, musty	3.00	
1610	Milton	Japan	2018	Brazil	Bahia	70%	intense, sour, hammy	3.00	
1611	Milton	Japan	2018	Vietnam	Ben Tre	70%	cocounut, late sour	3.25	
1612	Milton	Japan	2018	Madagascar	Ambanja	70%	cocoa, mild pear, sticky	3.50	
1613	Milton	Japan	2018	Peru	Piura Gran Blanco, Sisyu & Kiriwana Phoenix	70%	grape, thick, chewy	3.75	
1616	Minimal	Japan	2016	Haiti	Acul-du-Nord, 2015	70%	gritty, sweet, earty	3.50	
1655	Musee du Chocolat Theobroma	Japan	2018	Venezuela	Chuao	70%	Fruity, Roasty	3.50	
1789	Palet D'Or	Japan	2018	Vietnam	Vietnam	72%	molasses, tart, vegetal	3.25	
1790	Palet D'Or	Japan	2018	Haiti	Haiti	70%	vanilla, sweet, gateway	3.50	
1791	Palet D'Or	Japan	2018	Cuba	Cuba	72%	creamy, tobacco, cocoa	3.75	
2242	Sweet Escalier	Japan	2018	Peru	San Martin	70%	pungent, molasses, sour	2.50	
2243	Sweet Escalier	Japan	2018	Tanzania	Tanzania	75%	fatty, sour, off notes	2.75	
2244	Sweet Escalier	Japan	2018	Belize	Belize	70%	buttery, cheesy	3.00	
2245	Sweet Escalier	Japan	2018	Brazil	Amazonas, Wild Cacao	70%	cardboard, cheesy	3.00	
2246	Sweet Escalier	Japan	2018	Venezuela	Chuao	75%	acidic, cocoa, dried fruit	3.25	
2269	Tablette (aka Vanillabeans)	Japan	2015	Trinidad	Trinidad	77%	intense, grassy, smokey	2.75	
2270	Tablette (aka Vanillabeans)	Japan	2015	Colombia	Colombia	70%	flat, smoke, marshmallow	3.00	
2271	Tablette (aka Vanillabeans)	Japan	2015	Papua New Guinea	Papua	62%	creamy, smoke, ham	3.25	

#Mean, Median, STD, Min, and Max rating for Japan's Chocolate

```
jpmean = np.mean(JP['rating']).copy()
jpmed = np.median(JP['rating']).copy()
jpstd = np.std(JP['rating']).copy()
jpmin = np.min(JP['rating']).copy()
jpmax = np.max(JP['rating']).copy()
```

```
print("The mean for the chocolate rating in Japan is: ",jpmean)
print("The median for the chocolate rating in Japan is: ",jpmed)
print("Standard Deviation rating: ",jpstd)
print("Minimum Rate of Chocolate in Japan: ", jpmin)
print("Maximum Rate of Chocolate in Japan: ", jpmax)
```

The mean for the chocolate rating in Japan is: 3.129032258064516
The median for the chocolate rating in Japan is: 3.25
Standard Deviation rating: 0.3695625560448258
Minimum Rate of Chocolate in Japan: 2.25
Maximum Rate of Chocolate in Japan: 3.75

```
#All 2015 onwards review_date
y2015 = choc[choc['review_date'] >= 2015].copy()
y2015
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	
...	
2508	Zoto (Chocolatoa)	Belgium	2018	Nicaragua	El Castillero, batch ca1705, 3 turns	70%	large grits, sweet, dried fruit	3.75	
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	

1283 rows × 8 columns

Next steps:

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```
#All 2018 year for the y2015 onwards data
y18 = y2015[y2015['review_date'] == 2018].copy()
y18
```



	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	
30	A. Morin	France	2018	Venezuela	Porcelana	70%	alluring aroma, powdery,nutty	3.50	
31	A. Morin	France	2018	Peru	Absolu	63%	sweet, dairy, spice, cocoa	3.75	
71	Altus aka Cao Artisan	U.S.A.	2018	Dominican Republic	Oko Caribe	70%	sweet, coarse, nutty	3.00	
103	Amedei	Italy	2018	Madagascar	Madagascar	70%	vanilla, mint, roasty	3.00	
104	Amedei	Italy	2018	Venezuela	Chuaao	70%	vanilla, nuts, roasty	3.00	
...	
2507	Zoto (Chocolatoa)	Belgium	2018	Nicaragua	Rugoso	75%	sandy, basic cocoa	3.25	
2508	Zoto (Chocolatoa)	Belgium	2018	Nicaragua	El Castillero, batch ca1705, 3 turns	70%	large grits, sweet, dried fruit	3.75	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	

228 rows × 8 columns

Next steps:

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```
choc['category'] = np.where(choc['rating'] >= 4, 'Good', 'Average')
choc
```



	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	category	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	Average	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	Average	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	Average	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	Average	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	Average	
...	
2525	Zotter	Austria	2014	Blend	Raw	80%	waxy, cloying, vegetal	2.75	Average	
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	Average	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	Average	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	Average	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	Average	

2530 rows × 9 columns

Next steps:

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```
choc['category'] = np.where(choc['rating'] <= 2, 'Substandard', 'Average')
choc
```



	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	category	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	Average	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	Average	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	Average	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	Average	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	Average	
...	
2525	Zotter	Austria	2014	Blend	Raw	80%	waxy, cloying, vegetal	2.75	Average	
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	Average	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	Average	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	Average	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	Average	

2530 rows × 9 columns

Next steps:

☒ View recommended plots

```
Gd = choc[choc['category'] == 'Good'].copy()
Gd
```



	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	category	
18	A. Morin	France	2013	Venezuela	Chuaao	70%	oily, nut, caramel, raspberry	4.0	Good	
19	A. Morin	France	2013	Peru	Chanchamayo Province	63%	sweet, cocoa, tangerine	4.0	Good	
24	A. Morin	France	2014	Peru	Pablino	70%	delicate, hazelnut, brownie	4.0	Good	
32	A. Morin	France	2021	Mexico	La Joya	70%	light color, fruit, yogurt	4.0	Good	
79	Amano	U.S.A.	2010	Ecuador	Guayas	70%	strong spice, intense pepper	4.0	Good	
...	
2394	Valrhona	France	2011	Venezuela	Porcelana, Pedegral	64%	creamy, honey,peanut butter	4.0	Good	
2395	Valrhona	France	2012	Venezuela	Otucan, Grand Cru	69%	green,unripened fruit,banana	4.0	Good	
2398	Valrhona	France	2015	Peru	Piura, Illanka, Quemazon	63%	intense, dark berry, grapes	4.0	Good	
2459	Willie's Cacao	U.K.	2016	Colombia	Los Llanos	70%	rich cocoa, spicy, cinamon	4.0	Good	
2467	Woodblock	U.S.A.	2011	Venezuela	Ocumare	70%	nutty, tart, coffee	4.0	Good	

112 rows × 9 columns

Next steps:

 View recommended plots

```
av = choc[choc['category'] == 'Average'].copy()
av
```



	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	category	
0	5150	U.S.A.	2019	Tanzania	Kokoa Kamili, batch 1	76%	rich cocoa, fatty, bready	3.25	Average	
1	5150	U.S.A.	2019	Dominican Republic	Zorzal, batch 1	76%	cocoa, vegetal, savory	3.50	Average	
2	5150	U.S.A.	2019	Madagascar	Bejofo Estate, batch 1	76%	cocoa, blackberry, full body	3.75	Average	
3	5150	U.S.A.	2021	Fiji	Matasawalevu, batch 1	68%	chewy, off, rubbery	3.00	Average	
4	5150	U.S.A.	2021	Venezuela	Sur del Lago, batch 1	72%	fatty, earthy, moss, nutty,chalky	3.00	Average	
...	
2525	Zotter	Austria	2014	Blend	Raw	80%	waxy, cloying, vegetal	2.75	Average	
2526	Zotter	Austria	2017	Colombia	APROCAFA, Acandi	75%	strong nutty, marshmallow	3.75	Average	
2527	Zotter	Austria	2018	Blend	Dry Aged, 30 yr Anniversary bar	75%	fatty, earthy, cocoa	3.00	Average	
2528	Zotter	Austria	2018	Congo	Mountains of the Moon	70%	fatty, mild nuts, mild fruit	3.25	Average	
2529	Zotter	Austria	2018	Belize	Maya Mtn	72%	muted, roasty, accessible	3.50	Average	

2418 rows × 9 columns

Next steps:

 View recommended plots

```
ss = choc[choc['category'] == 'Substandard'].copy()
ss
```

	company_manufacturer	Company	review_date	Bean_Origin	specific_bean_origin_or_bar_name	cocoa_percent	most_memorable_characteristics	rating	category	
158	Artisan du Chocolat	U.K.	2009	Brazil	Brazil Rio Doce	72%	cocoa, dominate off note	1.75	Substandard	
164	Artisan du Chocolat	U.K.	2010	Venezuela	Venezuela	100%	very nutty, very bitter	1.75	Substandard	
293	Bonnat	France	2006	Blend	One Hundred	100%	acidic, bitter, dry	1.50	Substandard	
323	Bouga Cacao (Tulicorp)	Ecuador	2009	Ecuador	El Oro, Hacienda de Oro	100%	cardboard, very bitter, floral	1.50	Substandard	
373	Cacao Barry	France	2007	Venezuela	Venezuela	72%	sandy, dairy, cocoa	2.00	Substandard	
375	Cacao Barry	France	2008	Tanzania	Tanzania	75%	dry, flat flavor, astringent	2.00	Substandard	
426	Cacaoyere (Ecuadoriana)	Ecuador	2008	Ecuador	Pichincha	91%	klingly, hint of fruit, very bitter	1.50	Substandard	
430	Callebaut	Belgium	2007	Ecuador	Baking	70%	bitter, cocoa	1.00	Substandard	
448	Caoni (Tulicorp)	Ecuador	2008	Ecuador	Esmeraldas	77%	grainy, intense, bitter	2.00	Substandard	
470	Casa	U.S.A.	2018	Blend	Ecuador, Vietnam	75%	off notes, vanilla	2.00	Substandard	
590	Claudio Corallo	Sao Tome	2008	Blend	Principe, Sao Tome & Principe	100%	chalky, musty, very bitter	1.00	Substandard	
626	Coppeneur	Germany	2012	Ecuador	Ecuador Puristique	100%	high intensity bitter	1.50	Substandard	
632	Cote d' Or (Kraft)	Belgium	2006	Blend	Sensations Intense	70%	this is not chocolate	1.00	Substandard	
763	Dolfin (Belcolade)	Belgium	2006	Blend	Noir	70%	acidic, astringent, unpleasant	1.50	Substandard	
862	Escazu	U.S.A.	2009	Costa Rica	Guapiles	65%	sticky, slight plum, medicinal	2.00	Substandard	
883	Felchlin	Switzerland	2006	Blend	Supremo- SF	62%	malitol, cocoa	2.00	Substandard	
947	French Broad	U.S.A.	2012	Peru	Palo Blanco w/ panela, Chulucanas, b. 120725A	81%	sandpaper, some fruit, bitter	2.00	Substandard	
1106	Habitual	Canada	2014	Blend	one hundred	100%	unrefined, bitter, earthy	2.00	Substandard	
1165	Hoja Verde (Tulicorp)	Ecuador	2009	Ecuador	Arriba	80%	perfume, burning	2.00	Substandard	

Next steps

☒ View recommended plots

```
allmean = np.mean(choc['rating'])
allmed = np.median(choc['rating'])
allstd = np.std(choc['rating'])
allmin = np.min(choc['rating'])
allmax = np.max(choc['rating'])
print("Mean of all choco:" , allmean)
print("Median of all choco: ", allmed)
print("Standard Deviation of all choco: ", allstd)
print("Lowest Rating: ", allmin)
```