

Pyspark

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!pip install pyspark

Collecting pyspark
  Downloading pyspark-3.4.1.tar.gz (310.8 MB)
    310.8/310.8 MB 4.6 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Requirement already satisfied: py4j==0.10.9.7 in /usr/local/lib/python3.10/dist-packages (from pyspark) (0.10.9.7)
Building wheels for collected packages: pyspark
  Building wheel for pyspark (setup.py) ... done
  Created wheel for pyspark: filename=pyspark-3.4.1-py2.py3-none-any.whl size=311285387 sha256=df446e1f102
  Stored in directory: /root/.cache/pip/wheels/0d/77/a3/ff2f74cc9ab41f8f594dabf0579c2a7c6de920d584206e0834
Successfully built pyspark
Installing collected packages: pyspark
Successfully installed pyspark-3.4.1

[ ] from pyspark.sql import SparkSession

[ ] spark=SparkSession.builder.appName('Dataframe').getOrCreate()

[ ] spark

SparkSession - in-memory
SparkContext
Spark UI
Version
v3.4.1
Master
local[*]
AppName
Dataframe

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[ ] import pandas as pd

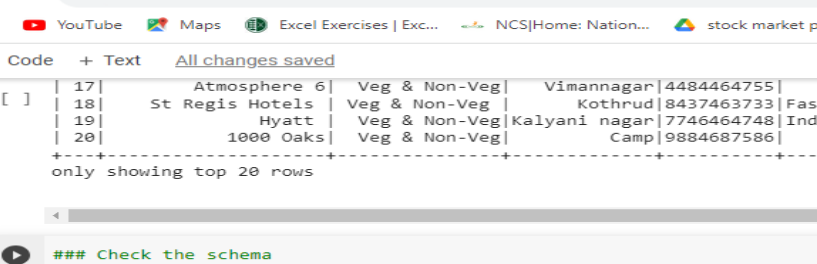
Food=spark.read.option('header','true').csv('FoodExcell1.txt',sep='\t')
Food.show()

+---+
| No | Restaurant Name | Restaurant Type | Address | Phone No | Cuisine | Orders count | Min price | Dining Available | Online_order Available | Payment Mode | Ratings | Rating Count |
+---+
| 1 | City Pride | Veg | Kothrud | 9223344221 | Indian, Chinese, ... | 45 | 300 | Yes | Both | 4 | 40 | |
| 2 | Divine | Non-Veg | Koregaon Park | 9222445555 | Biryani | 40 | 250 | No | Yes | Online | 2.5 | 35 |
| 3 | Tiranga | Veg & Non-Veg | Kothrud | 8513445456 | Chinese, Indian, B... | 54 | 350 | Yes | Both | 4.9 | 50 |
| 4 | Delhi Kitchen | Non-Veg | Aundh | 8165661215 | North Indian | 51 | 280 | No | Yes | Both | 3 | 48 |
| 5 | Marriott | Veg & Non-Veg | SB Road | 9933442211 | Indian, Chinese, ... | 45 | 250 | Yes | No | Offline | 3 | 45 |
| 6 | Vaishali Hotel | Veg | FC Road | 9786461456 | South Indian | 64 | 300 | Yes | Yes | Both | 4.8 | 60 |
| 7 | Regency Hotel | Veg | Baner | 9234556622 | Chinese, Indian, B... | 60 | 350 | No | Yes | Both | 5 | 58 |
| 8 | Mandarin Oriental | Veg | Karvenagar | 9433225511 | Chinese, Indian, B... | 48 | 280 | Yes | Yes | Offline | 4 | 47 |
| 9 | Four Seasons Hotel | Non-Veg | Deccan | 9566333241 | North Indian | 47 | 250 | Yes | Yes | Online | 3.1 | 47 |
| 10 | Rancho Casino | Veg | Vimanagar | 9877664532 | Chinese | 43 | 300 | Yes | No | Online | 4 | 40 |
| 11 | Clarion Hotel and... | Non-Veg | Katraj | 9654324677 | Indian, Chinese, ... | 65 | 350 | No | Yes | Both | 4.9 | 64 |
| 12 | Natraj | Veg & Non-Veg | Swargate | 9578754655 | Chinese, Indian, B... | 45 | 300 | Yes | Yes | Both | 3.5 | 44 |
| 13 | Continental Hotel... | Non-Veg | Hadapsar | 9543245677 | Chinese, Indian, B... | 50 | 340 | No | Yes | Both | 4 | 57 |
| 14 | Ritz Plaza Hotel | Non-Veg | Wakad | 9545362253 | Indian, Chinese, ... | 56 | 280 | Yes | Yes | Offline | 4 | 55 |
| 15 | Nisarg | Non-Veg | Erandwane | 8451645423 | Chinese, Indian, B... | 59 | 380 | Yes | Yes | Both | 4 | 55 |
| 16 | W Hotel | Veg | Kondhwa | 9435662245 | North Indian | 35 | 300 | No | Yes | Online | 3 | 25 |
| 17 | Atmosphere | Veg & Non-Veg | Vimanagar | 448464755 | Biryani | 70 | 450 | Yes | Yes | Both | 5 | 70 |
| 18 | St Regis Hotels | Veg & Non-Veg | Kothrud | 8437463733 | Fast Food, Chinese... | 25 | 300 | Yes | No | Offline | 1 | 23 |
| 19 | Hyatt | Veg & Non-Veg | Kalyani nagar | 7746464748 | Indian, Chinese, ... | 70 | 400 | Yes | Yes | Both | 4 | 65 |
| 20 | 1000 Oaks | Veg & Non-Veg | Camp | 9884687586 | Biryani | 60 | 300 | No | Yes | Online | 4.5 | 58 |
+---+

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[ ] ## Check the schema
Food.printSchema()

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The screenshot shows a Google Colab notebook interface. At the top, there are tabs for 'colab.google', 'FoodProject.ipynb - Colaboratory', and 'why use pip install pyspark datafi'. The main area displays a CSV file named 'FoodExcel11.txt' loaded into a Spark DataFrame. The DataFrame has 5 columns: 'id', 'Restaurant Name', 'Restaurant Type', 'Address', and 'Phone No.'. The first 20 rows are shown, with the last row being '1000 Oaks Veg & Non-Veg Kalyani nagar Camp 9884687586'. Below the DataFrame, the schema is printed, showing the following fields: 'id' (string, nullable), 'Restaurant Name' (string, nullable), 'Restaurant Type' (string, nullable), 'Address' (string, nullable), 'Phone No' (string, nullable), 'Cuisine' (string, nullable), 'Orders_count' (string, nullable), 'Min_price' (string, nullable), 'Dining_Available' (string, nullable), 'Online_order_Available' (string, nullable), 'Payment_Mode' (string, nullable), 'Ratings' (string, nullable), and 'Rating_Count' (string, nullable). The bottom status bar indicates '0s completed at 8:00'.

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Gmail YouTube Maps Excel Exercises | Exc... NCSJHome: Nation... stock market part 2...
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[ ]
17 | Atmosphere 6 | Veg & Non-Veg | Vimannagar | 4484464755 |
18 | St Regis Hotels | Veg & Non-Veg | Kothrud | 8437463733 | Fast Food, Ch
19 | Hyatt | Veg & Non-Veg | Kalyani nagar | 7746464748 | Indian, Chine
20 | 1000 Oaks | Veg & Non-Veg | Camp | 9884687586 |
+-----+-----+-----+-----+-----+
only showing top 20 rows

### Check the schema
Food.printSchema()

root
|-- No: string (nullable = true)
|-- Restaurant Name: string (nullable = true)
|-- Restaurant Type: string (nullable = true)
|-- Address: string (nullable = true)
|-- Phone No: string (nullable = true)
|-- Cuisine: string (nullable = true)
|-- Orders_count: string (nullable = true)
|-- Min_price: string (nullable = true)
|-- Dining_Available: string (nullable = true)
|-- Online_order_Available: string (nullable = true)
|-- Payment_Mode: string (nullable = true)
|-- Ratings: string (nullable = true)
|-- Rating_Count: string (nullable = true)

[ ] Food=spark.read.csv('FoodExcel11.txt',header=True,inferSchema=True,sep='\t')
Food.show()

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FoodProject.ipynb - Colaboratory
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[ ] | 19 | Hyatt | Veg & Non-Veg | Kalyani nagar | //46464/48 | Indian, Chinese, ... | /0 | 400 | Yes | Yes | Both | 4.0 |
    | 20 | 1000 Oaks | Veg & Non-Veg | Camp | 9884687586 | Biryani | 60 | 300 | No | Yes | Online | 4.5 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
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```

type(Food)
pyspark.sql.dataframe.DataFrame

```

[ ] Food.head(3)

[Row(N=1, Restaurant Name='CityPride ', Restaurant Type='Veg', Address='Kothrud', Phone No=9223344221, Cuisine='Indian, Chinese, North Indian, South Indian', Orders_count=45, Min_price=300, Dining_Available='Yes', Online_order_Available='No', Payment_Mode='Both', Ratings=4.0, Rating_Count=40),
 Row(N=2, Restaurant Name='Divine', Restaurant Type='Non-Veg', Address='KoregaonPark', Phone No=9322445555, Cuisine='Biryani', Orders_count=40, Min_price=290, Dining_Available='No', Online_order_Available='Yes', Payment_Mode='Online', Ratings=2.5, Rating_Count=35),
 Row(N=3, Restaurant Name='Tiranga', Restaurant Type='Veg & Non-Veg', Address='Kothrud', Phone No=8513445456, Cuisine='Chinese, Indian, Biryani, North Indian', Orders_count=54, Min_price=350, Dining_Available='Yes', Online_order_Available='Yes', Payment_Mode='Both', Ratings=4.9, Rating_Count=50)]

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[ ] Food.tail(2)

[Row(N=29, Restaurant Name='EatClub', Restaurant Type='Veg & Non-Veg ', Address='Mahalunge', Phone No=6464654966, Cuisine='Fast Food, Chinese, Beverages', Orders_count=43, Min_price=260, Dining_Available='No', Online_order_Available='Yes', Payment_Mode='Online', Ratings=3.9, Rating_Count=43),
 Row(N=30, Restaurant Name='Coriander Kitchen', Restaurant Type='Veg & Non-Veg ', Address='Sangamvadi', Phone No=5964464984, Cuisine='Chinese, Indian, Biryani, North Indian', Orders_count=50, Min_price=300, Dining_Available='Yes', Online_order_Available='Yes', Payment_Mode='Both', Ratings=4.9, Rating_Count=49)]

```

```

[ ] Food.select('Restaurant Name', 'Address').show()

+-----+-----+
| Restaurant Name | Address |
+-----+-----+
| CityPride      | Kothrud |
| Divine         | KoregaonPark |
| Tiranga        | Kothrud |
| Delhi Kitchen  | Aundh   |
| Marriott       | SBRoad  |
| Vaishali Hotel | FC Road |
| Regency Hotel  | Baner   |
| Mandarin Oriental | Karvenagar |
| Four Seasons Hotel | Deccan |
| Rancho Casino  | Vimannagar |
| Clarion Hotel and... | Katraj |
| Natraj         | Swargate |
| Continental Hotel... | Hadapsar |
| Ritz Plaza Hotel | Wakad   |
| Nisarg         | Erandwane |
| W Hotel        | Kondhwa |
| Atmosphere 6   | Vimannagar |
| St Regis Hotels | Kothrud  |
| Hyatt          | Kalyani nagar |
| 1000 Oaks      | Camp     |
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[ ] Food.select('Restaurant Name', 'Address').show()

+-----+-----+
| Restaurant Name | Address |
+-----+-----+
| CityPride      | Kothrud |
| Divine         | KoregaonPark |
| Tiranga        | Kothrud |
| Delhi Kitchen  | Aundh   |
| Marriott       | SBRoad  |
| Vaishali Hotel | FC Road |
| Regency Hotel  | Baner   |
| Mandarin Oriental | Karvenagar |
| Four Seasons Hotel | Deccan |
| Rancho Casino  | Vimannagar |
| Clarion Hotel and... | Katraj |
| Natraj         | Swargate |
| Continental Hotel... | Hadapsar |
| Ritz Plaza Hotel | Wakad   |
| Nisarg         | Erandwane |
| W Hotel        | Kondhwa |
| Atmosphere 6   | Vimannagar |
| St Regis Hotels | Kothrud  |
| Hyatt          | Kalyani nagar |
| 1000 Oaks      | Camp     |
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[ ] Food.dtypes

[('No', 'int'),
 ('Restaurant Name', 'string'),
 ('Restaurant Type', 'string')]

```

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[ ] [ ]
Ritz Plaza Hotel | Wakad |
Nisarg | Erandwane |
W Hotel | Kondhwa |
Atmosphere 6 | Vimannagar |
St Regis Hotels | Kothrud |
Hyatt | Kalyani nagar |
1000 Oaks | Camp |
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[ ] Food.dtypes

[('No', 'int'),
 ('Restaurant Name', 'string'),
 ('Restaurant Type', 'string'),
 ('Address', 'string'),
 ('Phone No', 'bigint'),
 ('Cuisine', 'string'),
 ('Orders_count', 'int'),
 ('Min_price', 'int'),
 ('Dining_Available', 'string'),
 ('Online_order_Available', 'string'),
 ('Payment_Mode', 'string'),
 ('Ratings', 'double'),
 ('Rating_Count', 'int')]

[ ] Food.describe().show()
```

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Food.describe().show()

summary|No|Restaurant Name|Restaurant Type|Address|Phone No|Cuisine|Orders_count|Min_price|Dining_Available|Online_order_Available|Payment_Mode|Ratings|Rating_Count|
count|30|30|30|30|30|30|30|30|30|30|30|3.72|46.56666666666667|
mean|15.5|null|null|null|8.296981675366667|Biryani|48.83333333333333|308.3333333333333|null|null|null|3.72|46.56666666666667|
stddev|8.883488438829595|null|null|null|1.5176951801679897|Biryani|12.91372788222544|49.982281288458345|null|null|null|1.00948485771135|13.174383814626983|
min|1|1000 Oaks|Veg|Aundh|4484464755|Biryani|23|250|No|No|Both|1.0|20|
max|30|W Hotel|Veg & Non-Veg|Warje|9933442211|South Indian|70|450|Yes|Yes|Online|5.0|70|

Food.show()

|No|Restaurant Name|Restaurant Type|Address|Phone No|Cuisine|Orders_count|Min_price|Dining_Available|Online_order_Available|Payment_Mode|Ratings|Rating_Count|
|1|CityPride|Veg|Kothrud|9223344221|Indian, Chinese, ...|45|300|Yes|No|Both|4.0|40|
|2|Divine|Non-Veg|KoregaonPark|9322445555|Biryani|40|290|Yes|Online|2.5|35|
|3|Tiranga|Veg & Non-Veg|Kothrud|8513445456|Chinese, Indian, Bi...|54|350|Yes|Both|4.9|50|
|4|Delhi Kitchen|Veg & Non-Veg|Aundh|8155661215|North Indian|51|280|No|Yes|Both|3.0|48|
|5|Harriott|Non-Veg|SBRoad|9933442211|Indian, Chinese, ...|45|250|Yes|No|Offline|3.0|45|
|6|Vaishali Hotel|Veg|FC Road|9786461456|South Indian|64|300|Yes|Yes|Both|4.8|60|
|7|Regency Hotel|Veg|Baner|9234556622|Chinese, Indian, Bi...|60|350|No|Yes|Both|5.0|58|
|8|Mandarin Oriental|Veg|Karvenagar|9433225511|Chinese, Indian, Bi...|48|280|Yes|Yes|Offline|4.0|47|
|9|Four Seasons Hotel|Non-Veg|Deccan|9566333241|North Indian|47|250|Yes|Yes|Online|3.1|47|
|10|Rancho Casino|Veg|Vimannagar|9877664532|Chinese|43|300|Yes|No|Online|4.0|40|
|11|Clarion Hotel and...|Non-Veg|Katraj|9654324677|Indian, Chinese, ...|65|350|No|Yes|Both|4.9|64|
|12|Natraj|Veg & Non-Veg|Swargate|5578754655|Chinese, Indian, Bi...|45|300|Yes|Yes|Both|3.5|44|
|13|Continental Hotel...|Non-Veg|Hadapsar|9543245677|Chinese, Indian, Bi...|58|340|No|Yes|Both|4.0|57|
|14|Ritz Plaza Hotel|Non-Veg|Wakad|9545362253|Indian, Chinese, ...|56|280|Yes|Yes|Offline|4.0|55|
|15|Nisarg|Non-Veg|Erandwane|8451645423|Chinese, Indian, Bi...|59|380|Yes|Yes|Both|4.0|55|
|16|W Hotel|Veg|Kondhwa|9435662245|North Indian|35|300|No|Yes|Online|3.0|25|
|17|Atmosphere 6|Veg & Non-Veg|Vimannagar|4484464755|Biryani|70|450|Yes|Yes|Both|5.0|70|
|18|St Regis Hotels|Veg & Non-Veg|Kothrud|8437463733|Fast Food, Chines...|25|300|Yes|No|Offline|1.0|23|
|19|Hyatt|Veg & Non-Veg|Kalyani nagar|7746464748|Indian, Chinese, ...|70|400|Yes|Yes|Both|4.0|65|
|20|1000 Oaks|Veg & Non-Veg|Camp|9884687586|Biryani|60|300|No|Yes|Online|4.5|58|

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[ ] ## Rename the columns
Food.withColumnRenamed('Restaurant Name', 'Restaurant Full Name').show()
```

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Go to Settings to activate Windows.

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[ ] 18 | St Regis Hotels | Veg & Non-Veg | Kothrud | 9437463733 | Fast Food, Chinese... | 25 | 300 | Yes | No | Offline | 1.0 | 23 |
19 | Hyatt | Veg & Non-Veg | Kalyani nagar | 7746464748 | Indian, Chinese, ... | 70 | 400 | Yes | Yes | Both | 4.0 | 65 |
20 | 1000 Oaks | Veg & Non-Veg | Camp | 9884687586 | Biryani | 60 | 300 | No | Yes | Online | 4.5 | 58 |
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[ ] ### Rename the columns
Food.withColumnRenamed('Restaurant Name','Restaurant Full Name').show()
```

	No	Restaurant Full Name	Restaurant Type	Address	Phone No	Cuisine	Orders_count	Min_price	Dining_Available	Online_order_Available	Payment_Mode	Rating	Rating_Count
1		CityPride	Veg	Kothrud	9223344221	Indian, Chinese, ...	45	300	Yes	No	Both	4.0	40
2		Divine	Non-Veg	KoregaonPark	9322445555	Biryani	40	290	No	Yes	Online	2.5	35
3		Tiranga	Veg & Non-Veg	Kothrud	8513445456	Chinese,Indian,Bi...	54	350	Yes	Yes	Both	4.9	50
4		Delhi kitchen	Veg & Non-Veg	Aundh	8165661215	North Indian	51	280	No	Yes	Both	3.0	48
5		Harriott	Non-Veg	SBRoad	9933442211	Indian, Chinese, ...	45	250	Yes	No	Offline	3.0	45
6		Vaishali Hotel	Veg	FC Road	9786461456	South Indian	64	300	Yes	Yes	Both	4.8	60
7		Regency Hotel	Veg	Baner	9234556622	Chinese,Indian,Bi...	60	350	No	Yes	Both	5.0	58
8		Mandarin Oriental	Veg	Karvenagar	9433225511	Chinese,Indian,Bi...	48	280	Yes	Yes	Offline	4.0	47
9		Four Seasons Hotel	Non-Veg	Deccan	9566333241	North Indian	47	250	Yes	Yes	Online	3.1	47
10		Rancho Casino	Veg	Vimannagar	9877664532	Chinese	43	300	Yes	No	Online	4.0	40
11		Clarion Hotel and...	Non-Veg	Katraj	9654324677	Indian, Chinese, ...	65	350	No	Yes	Both	4.9	64
12		Natraj	Veg & Non-Veg	Swargate	5578754655	Chinese,Indian,Bi...	45	300	Yes	Yes	Both	3.5	44
13		Continental Hotel...	Non-Veg	Hadapsar	9543245677	Chinese,Indian,Bi...	58	340	No	Yes	Both	4.0	57
14		Ritz Plaza Hotel	Non-Veg	Wakad	9545362253	Indian, Chinese, ...	56	280	Yes	Yes	Offline	4.0	55
15		Nisarg	Non-Veg	Erandwane	8451645423	Chinese,Indian,Bi...	59	300	Yes	Yes	Both	4.0	55
16		W Hotel	Veg	Kondhwa	9435662245	North Indian	35	300	No	Yes	Online	3.0	25
17		Atmosphere 6	Veg & Non-Veg	Vimannagar	4484464755	Biryani	70	450	Yes	Yes	Both	5.0	70
18		St Regis Hotels	Veg & Non-Veg	Kothrud	9437463733	Fast Food, Chinese...	25	300	Yes	No	Offline	1.0	23
19		Hyatt	Veg & Non-Veg	Kalyani nagar	7746464748	Indian, Chinese, ...	70	400	Yes	Yes	Both	4.0	65
20		1000 Oaks	Veg & Non-Veg	Camp	9884687586	Biryani	60	300	No	Yes	Online	4.5	58

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Null Operation

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Null operation

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Null Operation

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[ ] Food1 = spark.read.csv('FoodExcel12.txt')
Food1.show()
```

	_c0	_c1	_c2	_c3	_c4	_c5	_c6	_c7	_c8	_c9	_c10	_c11	_c12
	null	CityPride	Veg	Kothrud	9223344221	Indian/Chinese/No...	45	300	Yes	No	Both	4	40
	null		Non-Veg	KoregaonPark	9322445555	Biryani	40	290	No	Yes	Online	2.5	35
	null			Kothrud	8513445456	Chinese/Indian/Bi...	54	350	Yes	Yes	Both	4.9	50
	null				8165661215	North Indian	51	280	No	Yes	Both	3	48
	null					Indian/Chinese/No...	45	250	Yes	No	Offline	3	45
6		Vaishali Hotel	Veg	FC Road	9786461456	South Indian	64	300	Yes	Yes	Both	4.8	60
7		Regency Hotel	Veg	Baner	9234556622	Chinese/Indian/Bi...	60	350	No	Yes	Both	null	null
8		Mandarin Oriental	Veg	Karvenagar	9433225511	Chinese/Indian/Bi...	48	280	Yes	null	null	4	47
9		Four Seasons Hotel	Non-Veg	Deccan	9566333241	North Indian	47	250	Yes	Yes	Online	3.1	47
10		Rancho Casino	Veg	Vimannagar	9877664532	Chinese	43	300	Yes	No	Online	4	40
11		Clarion Hotel and...	Non-Veg	Katraj	9654324677	Indian/Chinese/No...	65	350	No	Yes	Both	4.9	64
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13		Continental Hotel...	Non-Veg	Hadapsar	9543245677	Chinese/Indian/Bi...	58	340	No	Yes	Both	4	57
14		Ritz Plaza Hotel	Non-Veg	Wakad	9545362253	Indian/Chinese/No...	56	280	Yes	Yes	Offline	4	55
15		Nisarg	Non-Veg	Erandwane	8451645423	Chinese/Indian/Bi...	59	300	Yes	Yes	Both	4	55
16		W Hotel	Veg	Kondhwa	9435662245	North Indian	35	300	No	Yes	Online	3	25
17		Atmosphere 6	Veg & Non-Veg	Vimannagar	4484464755	Biryani	70	450	Yes	Yes	Both	5	70
18		St Regis Hotels	Veg & Non-Veg	Kothrud	9437463733	Fast Food/Chinese...	25	300	Yes	No	Offline	1	23
19		Hyatt	Veg & Non-Veg	Kalyani nagar	7746464748	Indian/Chinese/No...	70	400	Yes	Yes	Both	4	65
20		1000 Oaks	Veg & Non-Veg	Camp	9884687586	Biryani	60	300	No	Yes	Online	4.5	58

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```
[ ] Food1.columns
```

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[] Food1.columns

```
[ '_c0',
  '_c1',
  '_c2',
  '_c3',
  '_c4',
  '_c5',
  '_c6',
  '_c7',
  '_c8',
  '_c9',
  '_c10',
  '_c11',
  '_c12']
```

```
Food1=Food1.withColumnRenamed('_c0','No')\
.withColumnRenamed('_c1','Restaurant Name')\
.withColumnRenamed('_c2','Restaurant Type')\
.withColumnRenamed('_c3','Address')\
.withColumnRenamed('_c4','Phone No')\
.withColumnRenamed('_c5','Cuisine')\
```

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```
Food1=Food1.withColumnRenamed('_c0','No')\
.withColumnRenamed('_c1','Restaurant Name')\
.withColumnRenamed('_c2','Restaurant Type')\
.withColumnRenamed('_c3','Address')\
.withColumnRenamed('_c4','Phone No')\
.withColumnRenamed('_c5','Cuisine')\
.withColumnRenamed('_c6','Orders_Count')\
.withColumnRenamed('_c7','Min_Price')\
.withColumnRenamed('_c8','Dining_Available')\
.withColumnRenamed('_c9','Online_order_Available')\
.withColumnRenamed('_c10','Payment_Mode')\
.withColumnRenamed('_c11','Ratings')\
.withColumnRenamed('_c12','Rating_Count')
```

[] Food1.show()

No	Restaurant Name	Restaurant Type	Address	Phone No	Cuisine	Orders_Count	Min_Price	Dining_Available	Online_order_Available	Payment_Mode	Ratings	Rating_Count
null	CityPride	Veg	Kothrud	9223344221	Indian/Chinese/No...	45	300	Yes	No	Both	4	40
null	null	Non-Veg	KoregaonPark	9322445555	Biryani	40	290	No	Yes	Online	2.5	35
null	null	null	Kothrud	8513445456	Chinese/Indian/Bi...	54	350	Yes	Yes	Both	4.9	50
null	null	null	null	8165661215	North Indian	51	280	No	Yes	Both	3	48
null	null	null	null	null	Indian/Chinese/No...	45	250	Yes	No	Offline	3	45
6	Vaishali Hotel	Veg	FC Road	9786461456	South Indian	64	300	Yes	Yes	Both	4.8	60
7	Regency Hotel	Veg	Baner	9234556622	Chinese/Indian/Bi...	60	350	No	Yes	Both	null	null
8	Mandarin Oriental	Veg	Karvenagar	9433225511	Chinese/Indian/Bi...	48	280	Yes	null	Both	4	47
9	Four Seasons Hotel	Non-Veg	Deccan	9566333241	North Indian	47	250	Yes	Yes	Online	3.1	47
10	Rancho Casino	Veg	Vinannagar	9877664532	Chinese	43	300	Yes	No	Online	4	40
11	Clarion Hotel and...	Non-Veg	Katraj	9654324677	Indian/Chinese/No...	65	350	No	Yes	Both	4.9	64
12	Natraj	Veg & Non-Veg	Swargate	5578754655	Chinese/Indian/Bi...	45	300	Yes	Yes	Both	3.5	44
13	Continental Hotel...	Non-Veg	Hadapsar	9543245677	Chinese/Indian/Bi...	58	340	No	Yes	Both	4	57
14	Ritz Plaza Hotel	Non-Veg	Wakad	9545362253	Indian/Chinese/No...	56	280	Yes	Yes	Offline	4	55
15	Nisarg	Non-Veg	Erandwane	9451645423	Chinese/Indian/Bi...	59	300	Yes	Yes	Both	4	55
16	W Hotel	Veg	Kondhwa	9435662245	North Indian	35	300	No	Yes	Online	3	25
17	Atmosphere 6	Veg & Non-Veg	Vinannagar	4484464755	Biryani	70	450	Yes	Yes	Both	5	70
18	St Regis Hotels	Veg & Non-Veg	Kothrud	8437463733	Fast Food/Chinese...	25	300	Yes	No	Offline	1	23
19	Hyatt	Veg & Non-Veg	Kalyani nagar	7746464748	Indian/Chinese/No...	70	400	Yes	Yes	Both	4	85
20	1000 Oaks	Veg & Non-Veg	Camp	9884687586	Biryani	60	300	No	Yes	Online	4.5	58

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```
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[ ] Food1.columns

['No',
 'Restaurant Name',
 'Restaurant Type',
 'Address',
 'Phone No',
 'Cuisine',
 'Orders_count',
 'Min_price',
 'Dining_Available',
 'Online_order_Available',
 'Payment Mode',
 'Ratings',
 'Rating_Count']

[ ] Food1.select('Restaurant Name').show()

+-----+
| Restaurant Name |
+-----+
| CityPride       |
|                 |
|                 |
|                 |
|                 |
|                 |
| Vaishali Hotel  |
| Regency Hotel   |
| Mandarin Oriental |
| Four Seasons Hotel |
| Rancho Casino   |
| Clarion Hotel and... |
| Natraj          |
| Continental Hotel... |
| Ritz Plaza Hotel |
| Nisarg          |
| W Hotel         |
| Atmosphere 6    |
| St Regis Hotels |
| Hyatt           |
| 1000 Oaks       |
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```

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[ ] Atmosphere 6
St Regis Hotels
Hyatt
1000 Oaks
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[ ] Food1.na.drop(how="any", subset=['Restaurant Name']).show()

+-----+
| No | Restaurant Name | Restaurant Type | Address | Phone No | Cuisine | Orders_count | Min_price | Dining_Available | Online_order_Available | Payment Mode | Ratings | Rating_Count |
+-----+
| null | CityPride | Veg | Kothrud | 9223344221 | Indian/Chinese/No... | 45 | 300 | Yes | No | Both | 4 | 40 |
| 6 | Vaishali Hotel | Veg | FC Road | 9786461456 | South Indian | 64 | 300 | Yes | Yes | Both | 4.8 | 60 |
| 7 | Regency Hotel | Veg | Baner | 9234556622 | Chinese/Indian/Bi... | 60 | 350 | No | Yes | Both | null | null |
| 8 | Mandarin Oriental | Veg | Karvenagar | 9433225511 | Chinese/Indian/Bi... | 40 | 280 | Yes | null | null | 4 | 47 |
| 9 | Four Seasons Hotel | Non-Veg | Deccan | 9566333241 | North Indian | 47 | 250 | Yes | Yes | Online | 3.1 | 47 |
| 10 | Rancho Casino | Veg | Vimanagar | 9877664532 | Chinese | 43 | 300 | Yes | No | Online | 4 | 40 |
| 11 | Clarion Hotel and... | Non-Veg | Katraj | 9654324677 | Indian/Chinese/No... | 65 | 350 | No | Yes | Both | 4.9 | 64 |
| 12 | Natraj | Veg & Non-Veg | Swargate | 5578754655 | Chinese/Indian/Bi... | 45 | 300 | Yes | Yes | Both | 3.5 | 44 |
| 13 | Continental Hotel... | Non-Veg | Hadapsar | 9543245677 | Chinese/Indian/Bi... | 50 | 340 | No | Yes | Both | 4 | 57 |
| 14 | Ritz Plaza Hotel | Non-Veg | Wakad | 9545362253 | Indian/Chinese/No... | 56 | 280 | Yes | Yes | Offline | 4 | 55 |
| 15 | Nisarg | Non-Veg | Erandwane | 8451645423 | Chinese/Indian/Bi... | 59 | 300 | Yes | Yes | Both | 4 | 55 |
| 16 | W Hotel | Veg | Kondhwa | 9435662245 | North Indian | 35 | 300 | No | Yes | Online | 3 | 25 |
| 17 | Atmosphere 6 | Veg & Non-Veg | Vimanagar | 4484464755 | Biryani | 70 | 450 | Yes | Yes | Both | 5 | 70 |
| 18 | St Regis Hotels | Veg & Non-Veg | Kothrud | 8437463733 | Fast Food/Chinese... | 25 | 300 | Yes | No | Offline | 1 | 23 |
| 19 | Hyatt | Veg & Non-Veg | Kalyani nagar | 7746464748 | Indian/Chinese/No... | 70 | 400 | Yes | Yes | Both | 4 | 65 |
| 20 | 1000 Oaks | Veg & Non-Veg | Camp | 9884687586 | Biryani | 60 | 300 | No | Yes | Online | 4.5 | 58 |
| 21 | Belmond | Veg | Aundh | 8474738992 | Chinese | 30 | 250 | No | Yes | Offline | 2 | 28 |
| 22 | Rosewood Hotels &... | Non-Veg | Warje | 8337828282 | Chinese/Indian/Bi... | 45 | 290 | Yes | No | Both | 3 | 43 |
| 23 | Ritz-Carlton Hotel | Veg | PuneCity | 8399292838 | Indian/Chinese/No... | 31 | 280 | No | Yes | Offline | 2.9 | 30 |
| 24 | Kokani | Veg & Non-Veg | Kothrud | 7378929289 | Chinese/Indian/Bi... | 55 | 300 | No | Yes | Both | 3.9 | 55 |
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[ ] Food1.count()
```

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Food1.count()

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Food1.na.fill('values',['Restaurant Name']).show()

No	Restaurant Name	Restaurant Type	Address	Phone No	Cuisine	Orders_count	Min_price	Dining_Available	Online_order_Available	Payment Mode	Rating	Rating_Count
1	CityPride	Veg	Kothrud	9223344221	Indian/Chinese/No...	45	300	Yes	No	Both	4	40
2	values	Non-Veg	KoregaonPark	9322445555	Biryani	40	290	No	Yes	Online	2.5	35
3	values	null	Kothrud	8513445456	Chinese/Indian/BI...	54	350	Yes	Yes	Both	4.9	50
4	values	null	null	8165661215	North Indian	51	280	No	Yes	Both	3	48
5	values	null	null	null	Indian/Chinese/No...	45	250	Yes	No	Offline	3	45
6	Vaishali Hotel	Veg	FC Road	9786461456	South Indian	64	300	Yes	Yes	Both	4.8	60
7	Regency Hotel	Veg	Baner	9234556622	Chinese/Indian/BI...	60	350	No	Yes	Both	null	47
8	Mandarin Oriental	Veg	Karvenagar	9433225511	Chinese/Indian/BI...	48	280	Yes	null	Both	4	47
9	Four Seasons Hotel	Non-Veg	Deccan	9566333241	North Indian	47	250	Yes	Yes	Online	3.1	47
10	Rancho Casino	Veg	Vimannagar	9877664532	Chinese	43	300	Yes	No	Online	4	40
11	Clarion Hotel and...	Non-Veg	Katraj	9654324677	Indian/Chinese/No...	65	350	No	Yes	Both	4.9	64
12	Natraj	Veg & Non-Veg	Swargate	5578754655	Chinese/Indian/BI...	45	300	Yes	Yes	Both	3.5	44
13	Continental Hotel...	Non-Veg	Hadapsar	9543245677	Chinese/Indian/BI...	58	340	No	Yes	Both	4	57
14	Ritz Plaza Hotel	Non-Veg	Wakad	9545362253	Indian/Chinese/No...	56	280	Yes	Yes	Offline	4	55
15	Nisarg	Non-Veg	Erandwane	8451645423	Chinese/Indian/BI...	59	380	Yes	Yes	Both	4	55
16	W Hotel	Veg	Kondhwa	9435662245	North Indian	35	300	No	Yes	Online	3	25
17	Atmosphere 6	Veg & Non-Veg	Vimannagar	4484464755	Biryani	70	450	Yes	Yes	Both	5	70
18	St Regis Hotels	Veg & Non-Veg	Kothrud	8437463733	Fast Food/Chinese...	25	300	Yes	No	Offline	1	23
19	Hyatt	Veg & Non-Veg	Kalyani nagar	7746464748	Indian/Chinese/No...	70	400	Yes	Yes	Both	4	65
20	1000 Oaks	Veg & Non-Veg	Camp	9884687586	Biryani	60	300	No	Yes	Online	4.5	58

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Food1.na.drop(thresh=3).show()

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Food1.na.drop(thresh=10).show()

No	Restaurant Name	Restaurant Type	Address	Phone No	Cuisine	Orders_count	Min_price	Dining_Available	Online_order_Available	Payment_Mc
1	CityPride	Veg	Kothrud	9223344221	Indian, Chinese, ...	45	300	Yes	No	Bc
2	values	Non-Veg	KoregaonPark	9322445555	Biryani	40	290	No	Yes	Onli
3	values	null	Kothrud	8513445456	Chinese,Indian,Bi...	54	350	Yes	Yes	Bc
4	Vaishali Hotel	Veg	FC Road	9786461456	South Indian	64	300	Yes	Yes	Bc
5	Regency Hotel	Veg	Baner	9234556622	Chinese,Indian,Bi...	60	350	No	Yes	Bc
6	Mandarin Oriental	Veg	Karvenagar	9433225511	Chinese,Indian,Bi...	48	280	Yes	null	nu
7	Four Seasons Hotel	Non-Veg	Deccan	9566333241	North Indian	47	250	Yes	Yes	Onli
8	Rancho Casino	Veg	Vimannagar	9877664532	Chinese	43	300	Yes	No	Onli
9	Clarion Hotel and...	Non-Veg	Katraj	9654324677	Indian, Chinese, ...	65	350	No	Yes	Bc
10	Natraj	Veg & Non-Veg	Swargate	5578754655	Chinese,Indian,Bi...	45	300	Yes	Yes	Bc
11	Continental Hotel...	Non-Veg	Hadapsar	9543245677	Chinese,Indian,Bi...	58	340	No	Yes	Bc
12	Ritz Plaza Hotel	Non-Veg	Wakad	9545362253	Indian, Chinese, ...	56	280	Yes	Yes	Offli
13	Nisarg	Non-Veg	Erandwane	8451645423	Chinese,Indian,Bi...	59	380	Yes	Yes	Bc
14	W Hotel	Veg	Kondhwa	9435662245	North Indian	35	300	No	Yes	Onli
15	Atmosphere 6	Veg & Non-Veg	Vimannagar	4484464755	Biryani	70	450	Yes	Yes	Bc
16	St Regis Hotels	Veg & Non-Veg	Kothrud	8437463733	Fast Food, Chines...	25	300	Yes	No	Offli
17	Hyatt	Veg & Non-Veg	Kalyani nagar	7746464748	Indian, Chinese, ...	70	400	Yes	Yes	Bc
18	1000 Oaks	Veg & Non-Veg	Camp	9884687586	Biryani	60	300	No	Yes	Onli
19	Belmond	Veg	Aundh	8474738992	Chinese	30	250	No	Yes	Offli

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Imputer

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[ ] 19 | Hyatt | Veg & Non-Veg | Kalyani nagar | 7746464748 | Indian/Chinese/No... | 70 | 400 | Yes | Yes | Both | 4 | 65 |
    20 | 1000 Oaks | Veg & Non-Veg | Camp | 9884687586 | Biryani | 60 | 300 | No | Yes | Online | 4.5 | 58 |
```

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Imputer

```
from pyspark.ml.feature import Imputer

inputCols=['Orders_count','Min_price','Rating_Count'],
outputCols=['{}_imputed'.format(c) for c in ['Orders_count','Min_price','Rating_Count']]
).setStrategy("median")

imputer = Imputer(
    inputCols=inputCols,
    outputCols=outputCols,
    strategy="median"
)

imputer.fit(Food).transform(Food).show()
```

No	Restaurant Name	Restaurant Type	Address	Phone No	Cuisine	Orders_count	Min_price	Dining_Available	Online_order_Available	Payment_Mode	Ratings	Rating_Count	Orders_count_imputed	Min_price_imputed	Rating_Count_imputed
1	CityPride	Veg	Kothrud 9223344221		Indian, Chinese, ...	45	300	Yes	No	Both	4.0	40	45	300	40
2	Divine	Non-Veg	KoregaonPark 9322445555		Biryani	40	290	No	Yes	Online	2.5	35	40	290	35
3	Tiranga	Veg & Non-Veg	Kothrud 8513445456		Chinese, Indian, Bi...	54	350	Yes	Yes	Both	4.9	50	54	350	50
4	Delhi Kitchen	Veg & Non-Veg	Aundh 8165661215		North Indian	51	200	No	Yes	Both	3.0	48	51	200	48
5	Marriott	Non-Veg	SBRoad 9933442211		Indian, Chinese, ...	45	250	Yes	No	Offline	3.0	45	45	250	45
6	Vaishali Hotel	Veg	FC Road 9786461456		South Indian	64	300	Yes	Yes	Both	4.8	60	64	300	60
7	Regency Hotel	Veg	Baner 9234556622		Chinese, Indian, Bi...	60	350	No	Yes	Both	5.0	58	60	350	58
8	Mandarin Oriental	Veg	Karvenagar 9433225511		Chinese, Indian, Bi...	48	280	Yes	Yes	Offline	4.0	47	48	280	47
9	Four Seasons Hotel	Non-Veg	Deccan 9566332441		North Indian	47	250	Yes	Yes	Online	3.1	47	47	250	47
10	Rancho Casino	Veg	Vinannagar 9877664532		Chinese	43	300	Yes	No	Online	4.0	40	43	300	40
11	Clarion Hotel and...	Non-Veg	Katraj 9654324677		Indian, Chinese, ...	65	350	No	Yes	Both	4.9	64	65	350	64
12	Natraj	Veg & Non-Veg	Swargate 5578754655		Chinese, Indian, Bi...	45	300	Yes	Yes	Both	3.5	44	45	300	44
13	Continental Hotel...	Non-Veg	Hadapsar 9543245677		Chinese, Indian, Bi...	58	340	No	Yes	Both	4.0	57	58	340	57
14	Ritz Plaza Hotel	Non-Veg	Wakad 9545362253		Indian, Chinese, ...	56	280	Yes	Yes	Offline	4.0	55	56	280	55
15	Nisarg	Non-Veg	Erandwane 8451645423		Chinese, Indian, Bi...	59	300	Yes	Yes	Both	4.0	55	59	300	55
16	W Hotel	Veg	Kondhwa 9435662245		North Indian	35	300	No	Yes	Online	3.0	25	35	300	25
17	Atmosphere 6	Veg & Non-Veg	Vinannagar 4484647555		Biryani	70	450	Yes	Yes	Both	5.0	70	70	450	70
18	St Regis Hotels	Veg & Non-Veg	Kothrud 8437463733		Fast Food, Chines...	25	300	Yes	No	Offline	1.0	23	25	300	23
19	Hyatt	Veg & Non-Veg	Kalyani nagar 7746464748		Indian, Chinese, ...	70	400	Yes	Yes	Both	4.5	65	70	400	65
20	1000 Oaks	Veg & Non-Veg	Camp 9884687586		Biryani	60	300	No	Yes	Online	4.5	58	60	300	58

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Food.filter("Min_price<250").show()

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[ ] Food.filter("Min_price<250").show()
```

No	Restaurant Name	Restaurant Type	Address	Phone No	Cuisine	Orders_count	Min_price	Dining_Available	Online_order_Available	Payment_Mode	Ratings	Rating_Count
5	Marriott	Non-Veg	SBRoad 9933442211		Indian, Chinese, ...	45	250	Yes	No	Offline	3.0	45
9	Four Seasons Hotel	Non-Veg	Deccan 9566332441		North Indian	47	250	Yes	Yes	Online	3.1	47
21	Belmond	Veg	Aundh 6474738992		Chinese	30	250	No	Yes	Offline	2.0	20
26	Fort Harrison Hotel	Non-Veg	Kharadi 7373782828		Biryani	23	250	Yes	Yes	Both	2.0	20
28	Shabree	Veg Shiwajinagar	4949845649		Chinese, Indian, Bi...	40	250	Yes	Yes	Both	3.8	40

```
[ ] Food.filter((Food['Orders_count'] >=45) & (Food['Min_price'] >=250)).show()
```

No	Restaurant Name	Restaurant Type	Address	Phone No	Cuisine	Orders_count	Min_price	Dining_Available	Online_order_Available	Payment_Mode	Ratings	Rating_Count
1	CityPride	Veg	Kothrud 9223344221		Indian, Chinese, ...	45	300	Yes	No	Both	4.0	40
3	Tiranga	Veg & Non-Veg	Kothrud 8513445456		Chinese, Indian, Bi...	54	350	Yes	Yes	Both	4.9	50
4	Delhi Kitchen	Veg & Non-Veg	Aundh 8165661215		North Indian	51	200	No	Yes	Both	3.0	48
6	Vaishali Hotel	Veg	FC Road 9786461456		South Indian	64	300	Yes	Yes	Both	4.8	60
7	Regency Hotel	Veg	Baner 9234556622		Chinese, Indian, Bi...	60	350	No	Yes	Both	5.0	58
8	Mandarin Oriental	Veg	Karvenagar 9433225511		Chinese, Indian, Bi...	48	280	Yes	Yes	Offline	4.0	47
11	Clarion Hotel and...	Non-Veg	Katraj 9654324677		Indian, Chinese, ...	65	350	No	Yes	Both	4.9	64
12	Natraj	Veg & Non-Veg	Swargate 5578754655		Chinese, Indian, Bi...	45	300	Yes	Yes	Both	3.5	44
13	Continental Hotel...	Non-Veg	Hadapsar 9543245677		Chinese, Indian, Bi...	58	340	No	Yes	Both	4.0	57
14	Ritz Plaza Hotel	Non-Veg	Wakad 9545362253		Indian, Chinese, ...	56	280	Yes	Yes	Offline	4.0	55
15	Nisarg	Non-Veg	Erandwane 8451645423		Chinese, Indian, Bi...	59	300	Yes	Yes	Both	4.0	55
17	Atmosphere 6	Veg & Non-Veg	Vinannagar 4484647555		Biryani	70	450	Yes	Yes	Both	5.0	70
19	Hyatt	Veg & Non-Veg	Kalyani nagar 7746464748		Indian, Chinese, ...	70	400	Yes	Yes	Both	4.5	65
20	1000 Oaks	Veg & Non-Veg	Camp 9884687586		Biryani	60	300	No	Yes	Online	4.5	58
22	Rosewood Hotels &...	Non-Veg	Warje 8337828282		Chinese, Indian, Bi...	45	290	Yes	No	Both	3.0	43
24	Kokani	Veg & Non-Veg	Kothrud 7378292899		Chinese, Indian, Bi...	55	300	No	Yes	Both	3.9	55
27	Kondares	Veg & Non-Veg	Hinjewadi 7373828282		Indian, Chinese, ...	69	400	No	Yes	Both	5.0	65
30	Coriander Kitchen	Veg & Non-Veg	Sangamwadi 5964464894		Chinese, Indian, Bi...	50	300	Yes	Yes	Both	4.9	49

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Pyspark GroupBy And Aggregate Functions

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colab.google x FoodProject.ipynb - Colaboratory x
colab.research.google.com/drive/12gPTSmnnoAxfvGAb

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[ ]
+-----+-----+
| 27| Kondares | veg & Non-Veg | Hinjawadi|7373882828|Ind:
| 30| Coriender Kitchen| veg & Non-Veg | Sangamvadi|5964464984|Chi
+-----+-----+

Pyspark GroupBy And Aggregate Functions

[ ] spark=SparkSession.builder.appName('Agg').getOrCreate()

[ ] spark

SparkSession - in-memory
SparkContext
Spark UI
Version
V3.4.1
Master
local[*]
AppName
Dataframe

[ ] Food.groupby('Restaurant_Type').count().show()

+-----+-----+
|Restaurant_Type|count|
+-----+-----+
|Veg & Non-Veg| 5|
|Veg & Non-Veg| 6|
|Veg| 5|
|Non-Veg| 2|
|Non-Veg| 5|
|Veg| 1|
|Veg| 4|
|Non-Veg| 2|
+-----+-----+
```

```
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[ ]
+-----+-----+
|Non-Veg| 2|
|Non-Veg| 5|
|Veg| 1|
|Veg| 4|
|Non-Veg| 2|
+-----+-----+

[ ] Food.groupby('Payment_Mode').count().show()

+-----+-----+
|Payment_Mode|count|
+-----+-----+
|Both| 17|
|Online| 7|
|Offline| 6|
+-----+-----+

[ ] Food.agg({'Orders_count': 'sum'}).show()

+-----+-----+
|sum(Orders_count)|
+-----+-----+
| 1465|
+-----+-----+

[ ] Food.agg({'Min_price': 'sum', 'Orders_count': 'count'}).show()

+-----+-----+
|sum(Min_price)|count(Orders_count)|
+-----+-----+
| 9250| 30|
+-----+-----+
```