

```
In [1]: import pandas as pd  
pd.__version__
```

```
Out[1]: '2.2.2'
```

```
In [16]: store = r'D:\FSDS & AI\Pratice\Sample - Superstore_Orders.csv'  
df = pd.read_csv(store)  
df
```

Out[16]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Wi Fc X.
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	/
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Flt
...	
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	US-2023-143259	10009	Jo
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	US-2023-115427	94533	
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	US-2023-156720	80538	
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	US-2023-143259	10009	G
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	CA-2023-143500	C0A	

10194 rows × 19 columns



In [20]: id(df)

Out[20]: 2211049484992

In [17]: `len(df)`

Out[17]: 10194

In [18]: `df.shape`

Out[18]: (10194, 19)

In [19]: `df.columns`

Out[19]: Index(['Category', 'City', 'Country/Region', 'Customer Name', 'Manufacturer', 'Order Date', 'Order ID', 'Postal Code', 'Product Name', 'Region', 'Segment', 'Ship Date', 'Ship Mode', 'State/Province', 'Sub-Category', 'Discount', 'Profit', 'Quantity', 'Sales'], dtype='object')

In [21]: `len(df.columns)`

Out[21]: 19

In [23]: `df.isnull()`

Out[23]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name	Region
0	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False
...
10189	False	False	False	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False	False	False	False

10194 rows × 19 columns

In [24]: `df.isnull().sum()`

Out[24]:

Category	0
City	0
Country/Region	0
Customer Name	0
Manufacturer	0
Order Date	0
Order ID	0
Postal Code	0
Product Name	0
Region	0
Segment	0
Ship Date	0
Ship Mode	0
State/Province	0
Sub-Category	0
Discount	0
Profit	0
Quantity	0
Sales	0

dtype: int64

In [33]: df[1:3]

Out[33]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name	Region
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	GBC Standard Plastic Binding Systems Combs	Ce
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	Avery 508	Ce

In [39]: df[20:5:-5]

Out[39]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Prod Na
20	Furniture	Dover	United States	Seth Vernon	DAX	11/1/2020	US-2020-130092	19901	DAX V&U-Char Docum Fran Easel B
15	Office Supplies	Huntsville	United States	Vivek Sundaresam	Acco	7/1/2020	US-2020-105417	77340	Acco F Pocket F Ring Bin with L
10	Office Supplies	Henderson	United States	Maria Etezadi	Southworth	6/1/2020	US-2020-167199	42420	Southw 2 Cot Gra Pape Envelo

In [41]: df.head(10)

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Message Book, Wirebound, Four 5 1/2" X 4" Form...
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	GBC Standard Plastic Binding Systems Combs
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	Avery 508
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	SAFCO Boltless Steel Shelving
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Avery Hi-Liter EverBold Pen Style Fluorescent ...
5	Furniture	Henderson	United States	Maria Etezadi	Global	6/1/2020	US-2020-167199	42420	Global Deluxe High-Back Manager's Chair
6	Office Supplies	Henderson	United States	Maria Etezadi	Rogers	6/1/2020	US-2020-167199	42420	Rogers Handheld Barrel Pencil Sharpener
7	Office Supplies	Athens	United States	Jack O'Briant	Dixon	6/1/2020	US-2020-106054	30605	Dixon Prang Watercolor Pencils, 10-Color Set w...
8	Office Supplies	Henderson	United States	Maria Etezadi	Ibico	6/1/2020	US-2020-167199	42420	Ibico Hi-Tech Manual Binding System
9	Office Supplies	Henderson	United States	Maria Etezadi	Alliance	6/1/2020	US-2020-167199	42420	Alliance Super-Size Bands, Assorted Sizes

```
df.tail()
```

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	US-2023-143259	10009	Wilson Jones Legal Research Binder
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	US-2023-115427	94533	Color Binded copy
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	US-2023-156720	80538	Bagged Rubbed Balm
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	US-2023-143259	10009	Google Home AU37 Headset
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	CA-2023-143500	C0A	Wilson Jones Improved Binder

```
df.isna()
```

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name	Region
0	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False
...
10189	False	False	False	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False	False	False	False
10194 rows × 19 columns										

statistical concepts in pandas

In [47]: `df.describe()`

Out[47]:

	Discount	Profit	Quantity	Sales
count	10194.000000	10194.000000	10194.000000	10194.000000
mean	0.155385	28.673417	3.791838	228.225854
std	0.206249	232.465115	2.228317	619.906839
min	0.000000	-6599.978000	1.000000	0.444000
25%	0.000000	1.760800	2.000000	17.220000
50%	0.200000	8.690000	3.000000	53.910000
75%	0.200000	29.297925	5.000000	209.500000
max	0.800000	8399.976000	14.000000	22638.480000

In [48]: `df`

Out[48]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Wi Fc X.
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	/
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Flt
...	
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	US-2023-143259	10009	Jo
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	US-2023-115427	94533	
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	US-2023-156720	80538	
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	US-2023-143259	10009	G
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	CA-2023-143500	C0A	

10194 rows × 19 columns



In [49]:

```
df.columns
df[:5]
```

Out[49]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Message Book, Wirebound, Four 5 1/2" X 4" Form...
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	GBC Standard Plastic Binding Systems Combs
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	Avery 508
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	SAFCO Boltless Steel Shelving
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Avery Hi-Liter EverBold Pen Style Fluorescent ...



```
In [1]: import pandas as pd
pd.__version__
```

Out[1]: '2.2.2'

```
In [3]: data = r'D:\FSDS & AI\Pratice\Sample - Superstore_Orders.csv'
df_orders = pd.read_csv(data)
df_orders
```

Out[3]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Wi Fc X.
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	/
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Flt
...	
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	US-2023-143259	10009	Jo
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	US-2023-115427	94533	
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	US-2023-156720	80538	
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	US-2023-143259	10009	G
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	CA-2023-143500	C0A	

10194 rows × 19 columns



In [5]: df_orders.head()

Out[5]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Message Book, Wirebound, Four 5 1/2" X 4" Form...
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	GBC Standard Plastic Binding Systems Combs
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	Avery 508
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	SAFCO Boltless Steel Shelving
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Avery Hi-Liter EverBold Pen Style Fluorescent ...

In [6]:

df_orders.tail()

Out[6]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Prod Na
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	US-2023-143259	10009	Wil Jo Le ' F Binc
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	US-2023-115427	94533	(Binc cov
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	US-2023-156720	80538	Bagi Rub Ba
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	US-2023-143259	10009	G H AU37 Heac
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	CA-2023-143500	COA	Wil Jo Imp Binc

In [7]:

df_orders.columns

Out[7]:

Index(['Category', 'City', 'Country/Region', 'Customer Name', 'Manufacturer', 'Order Date', 'Order ID', 'Postal Code', 'Product Name', 'Region', 'Segment', 'Ship Date', 'Ship Mode', 'State/Province', 'Sub-Category', 'Discount', 'Profit', 'Quantity', 'Sales'], dtype='object')

In [11]:

df_orders.describe()

Out[11]:

	Discount	Profit	Quantity	Sales
count	10194.000000	10194.000000	10194.000000	10194.000000
mean	0.155385	28.673417	3.791838	228.225854
std	0.206249	232.465115	2.228317	619.906839
min	0.000000	-6599.978000	1.000000	0.444000
25%	0.000000	1.760800	2.000000	17.220000
50%	0.200000	8.690000	3.000000	53.910000
75%	0.200000	29.297925	5.000000	209.500000
max	0.800000	8399.976000	14.000000	22638.480000

In [12]:

df_orders[:]

Out[12]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Wi Fc X.
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	4/1/2020	US-2020-112326	60540	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	4/1/2020	US-2020-112326	60540	/
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	4/1/2020	US-2020-112326	60540	
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	5/1/2020	US-2020-141817	19143	Flt
...	
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	US-2023-143259	10009	Jo
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	US-2023-115427	94533	
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	US-2023-156720	80538	
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	US-2023-143259	10009	G
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	CA-2023-143500	C0A	

10194 rows × 19 columns



In [13]: df_orders[0:3]

Out[13]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Message Book, Wirebound, Four 5 1/2" X 4" Form...
1	Office Supplies	Naperville	United States	Phyllina Ober	GBC	4/1/2020	US-2020-112326	60540	GBC Standard Plastic Binding Systems Combs
2	Office Supplies	Naperville	United States	Phyllina Ober	Avery	4/1/2020	US-2020-112326	60540	Avery 508

In [15]:

df_orders.isnull()

Out[15]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name	Region
0	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False
...
10189	False	False	False	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False	False	False	False

10194 rows × 19 columns

In [16]:

id(df_orders)

Out[16]:

2209774880768

In [17]:

len(df_orders)

Out[17]:

10194

In [18]:

df_orders.size

Out[18]: 193686

In [19]: `df_orders.shape`

Out[19]: (10194, 19)

In [20]: `df_orders[0:100:10]`

Out[20]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	F
0	Office Supplies	Houston	United States	Darren Powers	Message Book	3/1/2020	US-2020-103800	77015	Wire Four 1/4"
10	Office Supplies	Henderson	United States	Maria Etezadi	Southworth	6/1/2020	US-2020-167199	42420	Source 25% Granite & En
20	Furniture	Dover	United States	Seth Vernon	DAX	11/1/2020	US-2020-130092	19901	DAX V (Do Frame
30	Office Supplies	San Francisco	United States	Brian Dahlen	Tennsco	13-01-2020	US-2020-157147	94109	Ten Comp
40	Office Supplies	Scottsdale	United States	Toby Swindell	GBC	19-01-2020	US-2020-146591	85254	GBC S R Cover
50	Office Supplies	Jonesboro	United States	Hunter Lopez	Newell	20-01-2020	US-2020-147627	72401	New
60	Furniture	Miami	United States	Tom Boeckenhauer	Ultra	21-01-2020	US-2020-110422	33180	Ult Pull
70	Furniture	Alexandria	United States	Shirley Daniels	GE	26-01-2020	US-2020-155502	22304	GE Use f Bu Watts
80	Office Supplies	New York City	United States	Jasper Cacioppo	Pressboard	28-01-2020	US-2020-100328	10024	Pre: Cov Hooks
90	Office Supplies	Escondido	United States	Mark Haberlin	GBC	4/2/2020	US-2020-104808	92025	GBC S R Cover

In [22]: df_orders.isna()

Out[22]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Product Name	Region
0	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False
...
10189	False	False	False	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False	False	False	False

10194 rows × 19 columns



In [25]:

```
df_orders.query('City==Miami')
```

```
-----  
KeyError                                Traceback (most recent call last)  
File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\scope.py:231, in Scope.resolve(self, key, is_local)  
    230 if self.has_resolvers:  
--> 231     return self.resolvers[key]  
    233 # if we're here that means that we have no locals and we also have  
    234 # no resolvers
```

```
File C:\ProgramData\anaconda3\Lib\collections\__init__.py:1015, in ChainMap.__getitem__(self, key)  
    1014     pass  
-> 1015 return self.__missing__(key)
```

```
File C:\ProgramData\anaconda3\Lib\collections\__init__.py:1007, in ChainMap.__missing__(self, key)  
    1006 def __missing__(self, key):  
-> 1007     raise KeyError(key)
```

KeyError: 'Miami'

During handling of the above exception, another exception occurred:

```
KeyError                                Traceback (most recent call last)  
File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\scope.py:242, in Scope.resolve(self, key, is_local)  
    238 try:  
    239     # last ditch effort we look in temporaries  
    240     # these are created when parsing indexing expressions  
    241     # e.g., df[df > 0]  
--> 242     return self.temps[key]  
    243 except KeyError as err:
```

KeyError: 'Miami'

The above exception was the direct cause of the following exception:

```
UndefinedVariableError                 Traceback (most recent call last)  
Cell In[25], line 1  
----> 1 df_orders.query('City==Miami')  
  
File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\frame.py:4823, in DataFrame.query(self, expr, inplace, **kwargs)  
    4821 kwargs["level"] = kwargs.pop("level", 0) + 1  
    4822 kwargs["target"] = None  
-> 4823 res = self.eval(expr, **kwargs)  
    4825 try:  
    4826     result = self.loc[res]
```

```
File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\frame.py:4949, in DataFrame.eval(self, expr, inplace, **kwargs)  
    4946     kwargs["target"] = self  
    4947     kwargs["resolvers"] = tuple(kwargs.get("resolvers", ())) + resolvers  
-> 4949 return _eval(expr, inplace=inplace, **kwargs)
```

```
File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\eval.py:336, in eval(expr, parser, engine, local_dict, global_dict, resolvers, level, target, inplace)  
    327 # get our (possibly passed-in) scope  
    328 env = ensure_scope(  
    329     level + 1,  
    330     global_dict=global_dict,
```

```

(...)
333     target=target,
334 )
--> 336 parsed_expr = Expr(expr, engine=engine, parser=parser, env=env)
338 if engine == "numexpr" and (
339     is_extension_array_dtype(parsed_expr.terms.return_type)
340     or getattr(parsed_expr.terms, "operand_types", None) is not None
(...))
344 )
345 ):
346     warnings.warn(
347         "Engine has switched to 'python' because numexpr does not support "
348         "extension array dtypes. Please set your engine to python manually.",
349         RuntimeWarning,
350         stacklevel=find_stack_level(),
351     )

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:809, in Expr.__init__(self, expr, engine, parser, env, level)

```

807 self.parser = parser
808 self._visitor = PARSERS[parser](self.env, self.engine, self.parser)
--> 809 self.terms = self.parse()

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:828, in Expr.parse(self)

```

824 def parse(self):
825     """
826     Parse an expression.
827     """
--> 828     return self._visitor.visit(self.expr)

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:412, in BaseExprVisitor.visit(self, node, **kwargs)

```

410 method = f"visit_{type(node).__name__}"
411 visitor = getattr(self, method)
--> 412 return visitor(node, **kwargs)

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:418, in BaseExprVisitor.visit_Module(self, node, **kwargs)

```

416     raise SyntaxError("only a single expression is allowed")
417 expr = node.body[0]
--> 418 return self.visit(expr, **kwargs)

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:412, in BaseExprVisitor.visit(self, node, **kwargs)

```

410 method = f"visit_{type(node).__name__}"
411 visitor = getattr(self, method)
--> 412 return visitor(node, **kwargs)

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:421, in BaseExprVisitor.visit_Expr(self, node, **kwargs)

```

420 def visit_Expr(self, node, **kwargs):
--> 421     return self.visit(node.value, **kwargs)

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:412, in BaseExprVisitor.visit(self, node, **kwargs)

```

410 method = f"visit_{type(node).__name__}"
411 visitor = getattr(self, method)
--> 412 return visitor(node, **kwargs)

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:719, in BaseExprVisitor.visit_Compare(self, node, **kwargs)

```

717 op = self.translate_In(ops[0])
718 binop = ast.BinOp(op=op, left=node.left, right=comps[0])
--> 719 return self.visit(binop)
721 # recursive case: we have a chained comparison, a CMP b CMP c, etc.
722 left = node.left

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:412, in BaseExprV
isitor.visit(self, node, **kwargs)
    410 method = f"visit_{type(node).__name__}"
    411 visitor = getattr(self, method)
--> 412 return visitor(node, **kwargs)

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:532, in BaseExprV
isitor.visit_BinOp(self, node, **kwargs)
    531 def visit_BinOp(self, node, **kwargs):
--> 532 op, op_class, left, right = self._maybe_transform_eq_ne(node)
    533 left, right = self._maybe_downcast_constants(left, right)
    534 return self._maybe_evaluate_binop(op, op_class, left, right)

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:454, in BaseExprV
isitor._maybe_transform_eq_ne(self, node, left, right)
    452 left = self.visit(node.left, side="left")
    453 if right is None:
--> 454 right = self.visit(node.right, side="right")
    455 op, op_class, left, right = self._rewrite_membership_op(node, left, right)
    456 return op, op_class, left, right

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:412, in BaseExprV
isitor.visit(self, node, **kwargs)
    410 method = f"visit_{type(node).__name__}"
    411 visitor = getattr(self, method)
--> 412 return visitor(node, **kwargs)

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\expr.py:545, in BaseExprV
isitor.visit_Name(self, node, **kwargs)
    544 def visit_Name(self, node, **kwargs) -> Term:
--> 545 return self.term_type(node.id, self.env, **kwargs)

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\ops.py:91, in Term.__init
__(self, name, env, side, encoding)
    89 tname = str(name)
    90 self.is_local = tname.startswith(LOCAL_TAG) or tname in DEFAULT_GLOBALS
---> 91 self._value = self._resolve_name()
    92 self.encoding = encoding

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\ops.py:115, in Term._reso
lve_name(self)
    110 if local_name in self.env.scope and isinstance(
    111     self.env.scope[local_name], type
    112 ):
    113     is_local = False
--> 115 res = self.env.resolve(local_name, is_local=is_local)
    116 self.update(res)
    118 if hasattr(res, "ndim") and res.ndim > 2:

```

```

File C:\ProgramData\anaconda3\Lib\site-packages\pandas\core\computation\scope.py:244, in Scope.re
solve(self, key, is_local)
    242 return self.temps[key]
    243 except KeyError as err:
--> 244 raise UndefinedVariableError(key, is_local) from err

```

UndefinedVariableError: name 'Miami' is not defined

