

P8

```
In [ ]: import pandas as pd
import numpy as np
csv = pd.read_csv('./Parking.csv')
print(csv.info())
print(csv.shape)
print(csv.describe())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 128 entries, 0 to 127
Data columns (total 10 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Summons Number        128 non-null   int64
1   Plate ID              128 non-null   object
2   Registration State     128 non-null   object
3   Plate Type            128 non-null   object
4   Issue Date            128 non-null   object
5   Violation Code        128 non-null   int64
6   Vehicle Body Type     128 non-null   object
7   Vehicle Make          128 non-null   object
8   Issuing Agency        128 non-null   object
9   Street Code1          98 non-null    float64
```

```
dtypes: float64(1), int64(2), object(7)
```

```
memory usage: 10.1+ KB
```

```
None
```

```
(128, 10)
```

	Summons Number	Violation Code	Street Code1
count	1.280000e+02	128.000000	98.000000
mean	6.806207e+09	34.328125	2450.979592
std	2.362242e+09	18.551104	2427.015120
min	1.400876e+09	5.000000	19.000000
25%	5.092465e+09	20.000000	630.500000
50%	8.124282e+09	36.000000	1777.000000
75%	8.482552e+09	46.000000	3450.500000
max	8.581154e+09	78.000000	16135.000000

```
In [ ]: df_deleted = csv.dropna()
print("DataFrame after deleting rows with missing data:")
print(df_deleted)

df_replaced = csv.fillna(value='replacement_value')
print("DataFrame after replacing missing data:")
print(df_replaced)

df_ffill = csv.ffill()
print("DataFrame after forward filling missing data:")
print(df_ffill)

df_bfill = csv.bfill()
print("DataFrame after backward filling missing data:")
print(df_bfill)
```

DataFrame after deleting rows with missing data:

	Summons Number	Plate ID	Registration State	Plate Type	Issue Date
3	8478629828	66623ME	NY	COM	6/14/2017 \
4	7868300310	37033JV	NY	COM	11/21/2016
6	1413609545	X20DCM	NJ	PAS	8/3/2016
11	8009901763	13657MD	NY	COM	9/27/2016
13	1416492320	FGR5997	NY	PAS	9/30/2016
..
123	8377006390	GCR2084	NY	PAS	7/19/2016
124	8482178982	76691MH	NY	COM	4/24/2017
125	1417599716	12203MG	NY	COM	12/1/2016
126	7813974049	GLS7002	NY	PAS	9/9/2016
127	8149510126	GTP8988	NY	PAS	8/10/2016

	Violation Code	Vehicle Body Type	Vehicle Make	Issuing Agency
3	47	REFG	MITSU	T \
4	69	DELV	INTER	T
6	40	SDN	TOYOT	P
11	19	DELV	KENWO	T
13	21	SDN	NISSA	P
..
123	48	4DSD	HONDA	T
124	47	VAN	FRUEH	T
125	46	VAN	FRUEH	P
126	40	SUBN	FORD	T
127	16	2DSD	SMART	T

	Street Code1
3	161.0
4	151.0
6	547.0
11	151.0
13	5362.0
..	...
123	5952.0
124	181.0
125	2569.0
126	2969.0
127	4133.0

[98 rows x 10 columns]

DataFrame after replacing missing data:

	Summons Number	Plate ID	Registration State	Plate Type	Issue Date
0	5092469481	GZH7067	NY	PAS	7/10/2016 \
1	5092451658	GZH7067	NY	PAS	7/8/2016
2	4006265037	FZX9232	NY	PAS	8/23/2016
3	8478629828	66623ME	NY	COM	6/14/2017
4	7868300310	37033JV	NY	COM	11/21/2016
..
123	8377006390	GCR2084	NY	PAS	7/19/2016
124	8482178982	76691MH	NY	COM	4/24/2017
125	1417599716	12203MG	NY	COM	12/1/2016
126	7813974049	GLS7002	NY	PAS	9/9/2016
127	8149510126	GTP8988	NY	PAS	8/10/2016

Violation Code	Vehicle Body Type	Vehicle Make	Issuing Agency
----------------	-------------------	--------------	----------------

0	7	SUBN	TOYOT	V \
1	7	SUBN	TOYOT	V
2	5	SUBN	FORD	V
3	47	REFG	MITSU	T
4	69	DELV	INTER	T
..
123	48	4DSD	HONDA	T
124	47	VAN	FRUEH	T
125	46	VAN	FRUEH	P
126	40	SUBN	FORD	T
127	16	2DSD	SMART	T

	Street Code1
0	replacement_value
1	replacement_value
2	replacement_value
3	161.0
4	151.0
..	...
123	5952.0
124	181.0
125	2569.0
126	2969.0
127	4133.0

[128 rows x 10 columns]

DataFrame after forward filling missing data:

	Summons Number	Plate ID	Registration State	Plate Type	Issue Date	
0	5092469481	GZH7067	NY	PAS	7/10/2016	\
1	5092451658	GZH7067	NY	PAS	7/8/2016	
2	4006265037	FZX9232	NY	PAS	8/23/2016	
3	8478629828	66623ME	NY	COM	6/14/2017	
4	7868300310	37033JV	NY	COM	11/21/2016	
..	
123	8377006390	GCR2084	NY	PAS	7/19/2016	
124	8482178982	76691MH	NY	COM	4/24/2017	
125	1417599716	12203MG	NY	COM	12/1/2016	
126	7813974049	GLS7002	NY	PAS	9/9/2016	
127	8149510126	GTP8988	NY	PAS	8/10/2016	

	Violation Code	Vehicle Body Type	Vehicle Make	Issuing Agency	
0	7	SUBN	TOYOT	V \	
1	7	SUBN	TOYOT	V	
2	5	SUBN	FORD	V	
3	47	REFG	MITSU	T	
4	69	DELV	INTER	T	
..	
123	48	4DSD	HONDA	T	
124	47	VAN	FRUEH	T	
125	46	VAN	FRUEH	P	
126	40	SUBN	FORD	T	
127	16	2DSD	SMART	T	

	Street Code1
0	NaN
1	NaN

```

2      NaN
3    161.0
4    151.0
..      ...
123   5952.0
124   181.0
125   2569.0
126   2969.0
127   4133.0

```

[128 rows x 10 columns]

DataFrame after backward filling missing data:

	Summons Number	Plate ID	Registration State	Plate Type	Issue Date
0	5092469481	GZH7067	NY	PAS	7/10/2016 \
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	Violation Code	Vehicle Body Type	Vehicle Make	Issuing Agency
0	7	SUBN	TOYOT	V \
1	7	SUBN	TOYOT	V
2	5	SUBN	FORD	V
3	47	REFG	MITSU	T
4	69	DELV	INTER	T
..
123	48	4DSD	HONDA	T
124	47	VAN	FRUEH	T
125	46	VAN	FRUEH	P
126	40	SUBN	FORD	T
127	16	2DSD	SMART	T

```

Street Code1
0      161.0
1      161.0
2      161.0
3      161.0
4      151.0
..      ...
123   5952.0
124   181.0
125   2569.0
126   2969.0
127   4133.0

```

[128 rows x 10 columns]

```

In [ ]: grouped = csv.groupby('Registration State')
        filtered_group = grouped.get_group('AZ')
        print(filtered_group)

```

	Summons Number	Plate ID	Registration State	Plate Type	Issue Date	
16	5093620865	AD80228	AZ	PAS	9/24/2016	\

	Violation Code	Vehicle Body Type	Vehicle Make	Issuing Agency	Street Code1
16	7	TK	FORD	V	NaN