

ptksretbn

June 24, 2023

```
[4]: import pandas as pd
```

```
[8]: df=pd.read_excel(r"C:\Users\nvdsd\Downloads\Customer Call List.xlsx")
df
```

```
[8]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	\
0	1001	Frodo	Baggins	123-545-5421	
1	1002	Abed	Nadir	123/643/9775	
2	1003	Walter	/White	7066950392	
3	1004	Dwight	Schrute	123-543-2345	
4	1005	Jon	Snow	876 678 3469	
5	1006	Ron	Swanson	304-762-2467	
6	1007	Jeff	Winger	NaN	
7	1008	Sherlock	Holmes	876 678 3469	
8	1009	Gandalf	NaN	N/a	
9	1010	Peter	Parker	123-545-5421	
10	1011	Samwise	Gamgee	NaN	
11	1012	Harry	...Potter	7066950392	
12	1013	Don	Draper	123-543-2345	
13	1014	Leslie	Knope	876 678 3469	
14	1015	Toby	Flenderson_	304-762-2467	
15	1016	Ron	Weasley	123-545-5421	
16	1017	Michael	Scott	123/643/9775	
17	1018	Clark	Kent	7066950392	
18	1019	Creed	Braton	N/a	
19	1020	Anakin	Skywalker	876 678 3469	
20	1020	Anakin	Skywalker	876 678 3469	

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Yes	No	
1	93 West Main Street	No	Yes	
2	298 Drugs Driveway	N	NaN	
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y	
4	123 Dragons Road	Y	No	
5	768 City Parkway	Yes	Yes	
6	1209 South Street	No	No	
7	98 Clue Drive	N	No	

8	123 Middle Earth	Yes	NaN
9	25th Main Street, New York	Yes	No
10	612 Shire Lane, Shire	Yes	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Yes	N
13	343 City Parkway	Yes	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	No	N
16	121 Paper Avenue, Pennsylvania	Yes	No
17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Yes	N
20	910 Tatooine Road, Tatooine	Yes	N

	Not_Useful_Column
0	True
1	False
2	True
3	True
4	True
5	True
6	False
7	False
8	False
9	True
10	True
11	True
12	False
13	False
14	False
15	False
16	False
17	True
18	True
19	True
20	True

```
[11]: df=df.drop_duplicates()
df
```

```
[11]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	\
0	1001	Frodo	Baggins	123-545-5421	
1	1002	Abed	Nadir	123/643/9775	
2	1003	Walter	/White	7066950392	
3	1004	Dwight	Schrute	123-543-2345	
4	1005	Jon	Snow	876 678 3469	
5	1006	Ron	Swanson	304-762-2467	

6	1007	Jeff	Winger	NaN
7	1008	Sherlock	Holmes	876 678 3469
8	1009	Gandalf	NaN	N/a
9	1010	Peter	Parker	123-545-5421
10	1011	Samwise	Gamgee	NaN
11	1012	Harry	...Potter	7066950392
12	1013	Don	Draper	123-543-2345
13	1014	Leslie	Knope	876 678 3469
14	1015	Toby	Flenderson_	304-762-2467
15	1016	Ron	Weasley	123-545-5421
16	1017	Michael	Scott	123/643/9775
17	1018	Clark	Kent	7066950392
18	1019	Creed	Braton	N/a
19	1020	Anakin	Skywalker	876 678 3469

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Yes	No	
1	93 West Main Street	No	Yes	
2	298 Drugs Driveway	N	NaN	
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y	
4	123 Dragons Road	Y	No	
5	768 City Parkway	Yes	Yes	
6	1209 South Street	No	No	
7	98 Clue Drive	N	No	
8	123 Middle Earth	Yes	NaN	
9	25th Main Street, New York	Yes	No	
10	612 Shire Lane, Shire	Yes	No	
11	2394 Hogwarts Avenue	Y	NaN	
12	2039 Main Street	Yes	N	
13	343 City Parkway	Yes	No	
14	214 HR Avenue	N	No	
15	2395 Hogwarts Avenue	No	N	
16	121 Paper Avenue, Pennsylvania	Yes	No	
17	3498 Super Lane	Y	NaN	
18	N/a	N/a	Yes	
19	910 Tatooine Road, Tatooine	Yes	N	

	Not_Useful_Column
0	True
1	False
2	True
3	True
4	True
5	True
6	False
7	False
8	False

```

9          True
10         True
11         True
12        False
13        False
14        False
15        False
16        False
17         True
18         True
19         True

```

```
[12]: df=df.drop(columns="Not_Useful_Column")
df
```

```
[12]:
```

	CustomerID	First_Name	Last_Name	Phone_Number \
0	1001	Frodo	Baggins	123-545-5421
1	1002	Abed	Nadir	123/643/9775
2	1003	Walter	/White	7066950392
3	1004	Dwight	Schrute	123-543-2345
4	1005	Jon	Snow	876 678 3469
5	1006	Ron	Swanson	304-762-2467
6	1007	Jeff	Winger	NaN
7	1008	Sherlock	Holmes	876 678 3469
8	1009	Gandalf	NaN	N/a
9	1010	Peter	Parker	123-545-5421
10	1011	Samwise	Gamgee	NaN
11	1012	Harry	...Potter	7066950392
12	1013	Don	Draper	123-543-2345
13	1014	Leslie	Knope	876 678 3469
14	1015	Toby	Flenderson_	304-762-2467
15	1016	Ron	Weasley	123-545-5421
16	1017	Michael	Scott	123/643/9775
17	1018	Clark	Kent	7066950392
18	1019	Creed	Braton	N/a
19	1020	Anakin	Skywalker	876 678 3469

	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Yes	No
1	93 West Main Street	No	Yes
2	298 Drugs Driveway	N	NaN
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	123 Dragons Road	Y	No
5	768 City Parkway	Yes	Yes
6	1209 South Street	No	No
7	98 Clue Drive	N	No
8	123 Middle Earth	Yes	NaN

9	25th Main Street, New York	Yes	No
10	612 Shire Lane, Shire	Yes	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Yes	N
13	343 City Parkway	Yes	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	No	N
16	121 Paper Avenue, Pennsylvania	Yes	No
17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Yes	N

```
[14]: df["Last_Name"]=df["Last_Name"].str.lstrip("...")
df["Last_Name"]=df["Last_Name"].str.lstrip("/")
df["Last_Name"]=df["Last_Name"].str.rstrip("_")
df
```

```
[14]: CustomerID First_Name Last_Name Phone_Number \
0      1001      Frodo      Baggins 123-545-5421
1      1002      Abed      Nadir 123/643/9775
2      1003      Walter      White 7066950392
3      1004      Dwight      Schrute 123-543-2345
4      1005      Jon      Snow 876|678|3469
5      1006      Ron      Swanson 304-762-2467
6      1007      Jeff      Winger NaN
7      1008      Sherlock      Holmes 876|678|3469
8      1009      Gandalf      NaN N/a
9      1010      Peter      Parker 123-545-5421
10     1011      Samwise      Gamgee NaN
11     1012      Harry      Potter 7066950392
12     1013      Don      Draper 123-543-2345
13     1014      Leslie      Knope 876|678|3469
14     1015      Toby      Flenderson 304-762-2467
15     1016      Ron      Weasley 123-545-5421
16     1017      Michael      Scott 123/643/9775
17     1018      Clark      Kent 7066950392
18     1019      Creed      Braton N/a
19     1020      Anakin      Skywalker 876|678|3469
```

	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Yes	No
1	93 West Main Street	No	Yes
2	298 Drugs Driveway	N	NaN
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	123 Dragons Road	Y	No
5	768 City Parkway	Yes	Yes
6	1209 South Street	No	No

7	98 Clue Drive	N	No
8	123 Middle Earth	Yes	NaN
9	25th Main Street, New York	Yes	No
10	612 Shire Lane, Shire	Yes	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Yes	N
13	343 City Parkway	Yes	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	No	N
16	121 Paper Avenue, Pennsylvania	Yes	No
17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Yes	N

```
[16]: df["Phone_Number"] = df["Phone_Number"].str.replace('[^a-zA-Z0-9]', '')
df
```

C:\Users\nvdsd\AppData\Local\Temp\ipykernel_20956\3872638371.py:1:

FutureWarning: The default value of regex will change from True to False in a future version.

```
df["Phone_Number"] = df["Phone_Number"].str.replace('[^a-zA-Z0-9]', '')
```

```
[16]:
```

	CustomerID	First_Name	Last_Name	Phone_Number \
0	1001	Frodo	Baggins	1235455421
1	1002	Abed	Nadir	1236439775
2	1003	Walter	White	NaN
3	1004	Dwight	Schrute	1235432345
4	1005	Jon	Snow	8766783469
5	1006	Ron	Swanson	3047622467
6	1007	Jeff	Winger	NaN
7	1008	Sherlock	Holmes	8766783469
8	1009	Gandalf	NaN	Na
9	1010	Peter	Parker	1235455421
10	1011	Samwise	Gamgee	NaN
11	1012	Harry	Potter	NaN
12	1013	Don	Draper	1235432345
13	1014	Leslie	Knope	8766783469
14	1015	Toby	Flenderson	3047622467
15	1016	Ron	Weasley	1235455421
16	1017	Michael	Scott	1236439775
17	1018	Clark	Kent	NaN
18	1019	Creed	Braton	Na
19	1020	Anakin	Skywalker	8766783469

	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Yes	No
1	93 West Main Street	No	Yes

2	298 Drugs Driveway	N	NaN
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	123 Dragons Road	Y	No
5	768 City Parkway	Yes	Yes
6	1209 South Street	No	No
7	98 Clue Drive	N	No
8	123 Middle Earth	Yes	NaN
9	25th Main Street, New York	Yes	No
10	612 Shire Lane, Shire	Yes	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Yes	N
13	343 City Parkway	Yes	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	No	N
16	121 Paper Avenue, Pennsylvania	Yes	No
17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Yes	N

```
[24]: df["Phone_Number"] = df["Phone_Number"].apply(lambda x: str(x))
```

```
[37]: df["Phone_Number"] = df["Phone_Number"].apply(lambda x: x[0:3] + '-' + x[3:7] + '-' + x[7:11])
df
```

```
[37]:
```

	CustomerID	First_Name	Last_Name	Phone_Number \
0	1001	Frodo	Baggins	123-545-5421
1	1002	Abed	Nadir	123-643-9775
2	1003	Walter	White	nan--
3	1004	Dwight	Schrute	123-543-2345
4	1005	Jon	Snow	876-678-3469
5	1006	Ron	Swanson	304-762-2467
6	1007	Jeff	Winger	nan--
7	1008	Sherlock	Holmes	876-678-3469
8	1009	Gandalf	NaN	Na--
9	1010	Peter	Parker	123-545-5421
10	1011	Samwise	Gamgee	nan--
11	1012	Harry	Potter	nan--
12	1013	Don	Draper	123-543-2345
13	1014	Leslie	Knope	876-678-3469
14	1015	Toby	Flenderson	304-762-2467
15	1016	Ron	Weasley	123-545-5421
16	1017	Michael	Scott	123-643-9775
17	1018	Clark	Kent	nan--
18	1019	Creed	Braton	Na--
19	1020	Anakin	Skywalker	876-678-3469

	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Yes	No
1	93 West Main Street	No	Yes
2	298 Drugs Driveway	N	NaN
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	123 Dragons Road	Y	No
5	768 City Parkway	Yes	Yes
6	1209 South Street	No	No
7	98 Clue Drive	N	No
8	123 Middle Earth	Yes	NaN
9	25th Main Street, New York	Yes	No
10	612 Shire Lane, Shire	Yes	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Yes	N
13	343 City Parkway	Yes	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	No	N
16	121 Paper Avenue, Pennsylvania	Yes	No
17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Yes	N

```
[41]: df["Phone_Number"]=df["Phone_Number"].str.replace("nan--",'')
df["Phone_Number"]=df["Phone_Number"].str.replace("Na--",'')
df
```

```
[41]: CustomerID First_Name Last_Name Phone_Number \
0      1001      Frodo      Baggins 123-545-5421
1      1002      Abed      Nadir 123-643-9775
2      1003      Walter      White
3      1004      Dwight      Schrute 123-543-2345
4      1005      Jon      Snow 876-678-3469
5      1006      Ron      Swanson 304-762-2467
6      1007      Jeff      Winger
7      1008      Sherlock      Holmes 876-678-3469
8      1009      Gandalf      NaN
9      1010      Peter      Parker 123-545-5421
10     1011      Samwise      Gamgee
11     1012      Harry      Potter
12     1013      Don      Draper 123-543-2345
13     1014      Leslie      Knope 876-678-3469
14     1015      Toby      Flenderson 304-762-2467
15     1016      Ron      Weasley 123-545-5421
16     1017      Michael      Scott 123-643-9775
17     1018      Clark      Kent
18     1019      Creed      Braton
19     1020      Anakin      Skywalker 876-678-3469
```


	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Yes	No
1	93 West Main Street	No	Yes
2	298 Drugs Driveway	N	NaN
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	123 Dragons Road	Y	No
5	768 City Parkway	Yes	Yes
6	1209 South Street	No	No
7	98 Clue Drive	N	No
8	123 Middle Earth	Yes	NaN
9	25th Main Street, New York	Yes	No
10	612 Shire Lane, Shire	Yes	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Yes	N
13	343 City Parkway	Yes	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	No	N
16	121 Paper Avenue, Pennsylvania	Yes	No
17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Yes	N

```
[46]: df[["Street_Address", "State", "Zip"]]=df["Address"].str.split(',',2,expand=True)
df
```

C:\Users\nvdsd\AppData\Local\Temp\ipykernel_20956\914732160.py:1: FutureWarning:
In a future version of pandas all arguments of StringMethods.split except for
the argument 'pat' will be keyword-only.

```
df[["Street_Address", "State", "Zip"]]=df["Address"].str.split(',',2,expand=True)
```

```
[46]: CustomerID First_Name Last_Name Phone_Number \
0      1001      Frodo      Baggins 123-545-5421
1      1002      Abed      Nadir 123-643-9775
2      1003      Walter      White
3      1004      Dwight      Schrute 123-543-2345
4      1005      Jon      Snow 876-678-3469
5      1006      Ron      Swanson 304-762-2467
6      1007      Jeff      Winger
7      1008      Sherlock      Holmes 876-678-3469
8      1009      Gandalf      NaN
9      1010      Peter      Parker 123-545-5421
10     1011      Samwise      Gamgee
11     1012      Harry      Potter
12     1013      Don      Draper 123-543-2345
13     1014      Leslie      Knope 876-678-3469
14     1015      Toby      Flenderson 304-762-2467
```

15	1016	Ron	Weasley	123-545-5421
16	1017	Michael	Scott	123-643-9775
17	1018	Clark	Kent	
18	1019	Creed	Braton	
19	1020	Anakin	Skywalker	876-678-3469

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Yes	No	
1	93 West Main Street	No	Yes	
2	298 Drugs Driveway	N	NaN	
3	980 Paper Avenue, Pennsylvania, 18503	Yes	Y	
4	123 Dragons Road	Y	No	
5	768 City Parkway	Yes	Yes	
6	1209 South Street	No	No	
7	98 Clue Drive	N	No	
8	123 Middle Earth	Yes	NaN	
9	25th Main Street, New York	Yes	No	
10	612 Shire Lane, Shire	Yes	No	
11	2394 Hogwarts Avenue	Y	NaN	
12	2039 Main Street	Yes	N	
13	343 City Parkway	Yes	No	
14	214 HR Avenue	N	No	
15	2395 Hogwarts Avenue	No	N	
16	121 Paper Avenue, Pennsylvania	Yes	No	
17	3498 Super Lane	Y	NaN	
18	N/a	N/a	Yes	
19	910 Tatooine Road, Tatooine	Yes	N	

	Street Address	State	Zip	Street_Address
0	123 Shire Lane	Shire	None	123 Shire Lane
1	93 West Main Street	None	None	93 West Main Street
2	298 Drugs Driveway	None	None	298 Drugs Driveway
3	980 Paper Avenue	Pennsylvania	18503	980 Paper Avenue
4	123 Dragons Road	None	None	123 Dragons Road
5	768 City Parkway	None	None	768 City Parkway
6	1209 South Street	None	None	1209 South Street
7	98 Clue Drive	None	None	98 Clue Drive
8	123 Middle Earth	None	None	123 Middle Earth
9	25th Main Street	New York	None	25th Main Street
10	612 Shire Lane	Shire	None	612 Shire Lane
11	2394 Hogwarts Avenue	None	None	2394 Hogwarts Avenue
12	2039 Main Street	None	None	2039 Main Street
13	343 City Parkway	None	None	343 City Parkway
14	214 HR Avenue	None	None	214 HR Avenue
15	2395 Hogwarts Avenue	None	None	2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania	None	121 Paper Avenue
17	3498 Super Lane	None	None	3498 Super Lane

18	N/a	None	None	N/a
19	910 Tatooine Road	Tatooine	None	910 Tatooine Road

```
[50]: df["Paying Customer"]=df["Paying Customer"].str.replace('Yes','Y')
df["Paying Customer"]=df["Paying Customer"].str.replace('No','N')
df
```

```
[50]: CustomerID First_Name Last_Name Phone_Number \
0      1001      Frodo      Baggins 123-545-5421
1      1002      Abed      Nadir 123-643-9775
2      1003      Walter      White
3      1004      Dwight      Schrute 123-543-2345
4      1005      Jon      Snow 876-678-3469
5      1006      Ron      Swanson 304-762-2467
6      1007      Jeff      Winger
7      1008      Sherlock      Holmes 876-678-3469
8      1009      Gandalf      NaN
9      1010      Peter      Parker 123-545-5421
10     1011      Samwise      Gamgee
11     1012      Harry      Potter
12     1013      Don      Draper 123-543-2345
13     1014      Leslie      Knope 876-678-3469
14     1015      Toby      Flenderson 304-762-2467
15     1016      Ron      Weasley 123-545-5421
16     1017      Michael      Scott 123-643-9775
17     1018      Clark      Kent
18     1019      Creed      Braton
19     1020      Anakin      Skywalker 876-678-3469
```

	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Y	No
1	93 West Main Street	N	Yes
2	298 Drugs Driveway	N	NaN
3	980 Paper Avenue, Pennsylvania, 18503	Y	Y
4	123 Dragons Road	Y	No
5	768 City Parkway	Y	Yes
6	1209 South Street	N	No
7	98 Clue Drive	N	No
8	123 Middle Earth	Y	NaN
9	25th Main Street, New York	Y	No
10	612 Shire Lane, Shire	Y	No
11	2394 Hogwarts Avenue	Y	NaN
12	2039 Main Street	Y	N
13	343 City Parkway	Y	No
14	214 HR Avenue	N	No
15	2395 Hogwarts Avenue	N	N
16	121 Paper Avenue, Pennsylvania	Y	No

17	3498 Super Lane	Y	NaN
18	N/a	N/a	Yes
19	910 Tatooine Road, Tatooine	Y	N

	Street Address	State	Zip	Street_Address
0	123 Shire Lane	Shire	None	123 Shire Lane
1	93 West Main Street	None	None	93 West Main Street
2	298 Drugs Driveway	None	None	298 Drugs Driveway
3	980 Paper Avenue	Pennsylvania	18503	980 Paper Avenue
4	123 Dragons Road	None	None	123 Dragons Road
5	768 City Parkway	None	None	768 City Parkway
6	1209 South Street	None	None	1209 South Street
7	98 Clue Drive	None	None	98 Clue Drive
8	123 Middle Earth	None	None	123 Middle Earth
9	25th Main Street	New York	None	25th Main Street
10	612 Shire Lane	Shire	None	612 Shire Lane
11	2394 Hogwarts Avenue	None	None	2394 Hogwarts Avenue
12	2039 Main Street	None	None	2039 Main Street
13	343 City Parkway	None	None	343 City Parkway
14	214 HR Avenue	None	None	214 HR Avenue
15	2395 Hogwarts Avenue	None	None	2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania	None	121 Paper Avenue
17	3498 Super Lane	None	None	3498 Super Lane
18	N/a	None	None	N/a
19	910 Tatooine Road	Tatooine	None	910 Tatooine Road

```
[51]: df["Do_Not_Contact"]=df["Do_Not_Contact"].str.replace('Yes','Y')
df["Do_Not_Contact"]=df["Do_Not_Contact"].str.replace('No','N')
df
```

```
[51]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	\
0	1001	Frodo	Baggins	123-545-5421	
1	1002	Abed	Nadir	123-643-9775	
2	1003	Walter	White		
3	1004	Dwight	Schrute	123-543-2345	
4	1005	Jon	Snow	876-678-3469	
5	1006	Ron	Swanson	304-762-2467	
6	1007	Jeff	Winger		
7	1008	Sherlock	Holmes	876-678-3469	
8	1009	Gandalf	NaN		
9	1010	Peter	Parker	123-545-5421	
10	1011	Samwise	Gamgee		
11	1012	Harry	Potter		
12	1013	Don	Draper	123-543-2345	
13	1014	Leslie	Knope	876-678-3469	
14	1015	Toby	Flenderson	304-762-2467	
15	1016	Ron	Weasley	123-545-5421	

16	1017	Michael	Scott	123-643-9775
17	1018	Clark	Kent	
18	1019	Creed	Braton	
19	1020	Anakin	Skywalker	876-678-3469

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Y	N	
1	93 West Main Street	N	Y	
2	298 Drugs Driveway	N	NaN	
3	980 Paper Avenue, Pennsylvania, 18503	Y	Y	
4	123 Dragons Road	Y	N	
5	768 City Parkway	Y	Y	
6	1209 South Street	N	N	
7	98 Clue Drive	N	N	
8	123 Middle Earth	Y	NaN	
9	25th Main Street, New York	Y	N	
10	612 Shire Lane, Shire	Y	N	
11	2394 Hogwarts Avenue	Y	NaN	
12	2039 Main Street	Y	N	
13	343 City Parkway	Y	N	
14	214 HR Avenue	N	N	
15	2395 Hogwarts Avenue	N	N	
16	121 Paper Avenue, Pennsylvania	Y	N	
17	3498 Super Lane	Y	NaN	
18	N/a	N/a	Y	
19	910 Tatooine Road, Tatooine	Y	N	

	Street Address	State	Zip	Street_Address
0	123 Shire Lane	Shire	None	123 Shire Lane
1	93 West Main Street	None	None	93 West Main Street
2	298 Drugs Driveway	None	None	298 Drugs Driveway
3	980 Paper Avenue	Pennsylvania	18503	980 Paper Avenue
4	123 Dragons Road	None	None	123 Dragons Road
5	768 City Parkway	None	None	768 City Parkway
6	1209 South Street	None	None	1209 South Street
7	98 Clue Drive	None	None	98 Clue Drive
8	123 Middle Earth	None	None	123 Middle Earth
9	25th Main Street	New York	None	25th Main Street
10	612 Shire Lane	Shire	None	612 Shire Lane
11	2394 Hogwarts Avenue	None	None	2394 Hogwarts Avenue
12	2039 Main Street	None	None	2039 Main Street
13	343 City Parkway	None	None	343 City Parkway
14	214 HR Avenue	None	None	214 HR Avenue
15	2395 Hogwarts Avenue	None	None	2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania	None	121 Paper Avenue
17	3498 Super Lane	None	None	3498 Super Lane
18	N/a	None	None	N/a

19	910 Tatooine Road	Tatooine	None	910 Tatooine Road
----	-------------------	----------	------	-------------------

```
[57]: df=df.replace('N/a','')
df
```

```
[57]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	\
0	1001	Frodo	Baggins	123-545-5421	
1	1002	Abed	Nadir	123-643-9775	
2	1003	Walter	White		
3	1004	Dwight	Schrute	123-543-2345	
4	1005	Jon	Snow	876-678-3469	
5	1006	Ron	Swanson	304-762-2467	
6	1007	Jeff	Winger		
7	1008	Sherlock	Holmes	876-678-3469	
8	1009	Gandalf	NaN		
9	1010	Peter	Parker	123-545-5421	
10	1011	Samwise	Gamgee		
11	1012	Harry	Potter		
12	1013	Don	Draper	123-543-2345	
13	1014	Leslie	Knope	876-678-3469	
14	1015	Toby	Flenderson	304-762-2467	
15	1016	Ron	Weasley	123-545-5421	
16	1017	Michael	Scott	123-643-9775	
17	1018	Clark	Kent		
18	1019	Creed	Braton		
19	1020	Anakin	Skywalker	876-678-3469	

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Y	N	
1	93 West Main Street	N	Y	
2	298 Drugs Driveway	N	NaN	
3	980 Paper Avenue, Pennsylvania, 18503	Y	Y	
4	123 Dragons Road	Y	N	
5	768 City Parkway	Y	Y	
6	1209 South Street	N	N	
7	98 Clue Drive	N	N	
8	123 Middle Earth	Y	NaN	
9	25th Main Street, New York	Y	N	
10	612 Shire Lane, Shire	Y	N	
11	2394 Hogwarts Avenue	Y	NaN	
12	2039 Main Street	Y	N	
13	343 City Parkway	Y	N	
14	214 HR Avenue	N	N	
15	2395 Hogwarts Avenue	N	N	
16	121 Paper Avenue, Pennsylvania	Y	N	
17	3498 Super Lane	Y	NaN	
18			Y	

19	910 Tatooine Road, Tatooine	Y	N
----	-----------------------------	---	---

	Street Address	State	Zip	Street_Address
0	123 Shire Lane	Shire	None	123 Shire Lane
1	93 West Main Street	None	None	93 West Main Street
2	298 Drugs Driveway	None	None	298 Drugs Driveway
3	980 Paper Avenue	Pennsylvania	18503	980 Paper Avenue
4	123 Dragons Road	None	None	123 Dragons Road
5	768 City Parkway	None	None	768 City Parkway
6	1209 South Street	None	None	1209 South Street
7	98 Clue Drive	None	None	98 Clue Drive
8	123 Middle Earth	None	None	123 Middle Earth
9	25th Main Street	New York	None	25th Main Street
10	612 Shire Lane	Shire	None	612 Shire Lane
11	2394 Hogwarts Avenue	None	None	2394 Hogwarts Avenue
12	2039 Main Street	None	None	2039 Main Street
13	343 City Parkway	None	None	343 City Parkway
14	214 HR Avenue	None	None	214 HR Avenue
15	2395 Hogwarts Avenue	None	None	2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania	None	121 Paper Avenue
17	3498 Super Lane	None	None	3498 Super Lane
18		None	None	
19	910 Tatooine Road	Tatooine	None	910 Tatooine Road

```
[61]: df=df.fillna('')
df
```

```
[61]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	\
0	1001	Frodo	Baggins	123-545-5421	
1	1002	Abed	Nadir	123-643-9775	
2	1003	Walter	White		
3	1004	Dwight	Schrute	123-543-2345	
4	1005	Jon	Snow	876-678-3469	
5	1006	Ron	Swanson	304-762-2467	
6	1007	Jeff	Winger		
7	1008	Sherlock	Holmes	876-678-3469	
8	1009	Gandalf			
9	1010	Peter	Parker	123-545-5421	
10	1011	Samwise	Gamgee		
11	1012	Harry	Potter		
12	1013	Don	Draper	123-543-2345	
13	1014	Leslie	Knope	876-678-3469	
14	1015	Toby	Flenderson	304-762-2467	
15	1016	Ron	Weasley	123-545-5421	
16	1017	Michael	Scott	123-643-9775	
17	1018	Clark	Kent		
18	1019	Creed	Braton		

19 1020 Anakin Skywalker 876-678-3469

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Y	N	
1	93 West Main Street	N	Y	
2	298 Drugs Driveway	N		
3	980 Paper Avenue, Pennsylvania, 18503	Y	Y	
4	123 Dragons Road	Y	N	
5	768 City Parkway	Y	Y	
6	1209 South Street	N	N	
7	98 Clue Drive	N	N	
8	123 Middle Earth	Y		
9	25th Main Street, New York	Y	N	
10	612 Shire Lane, Shire	Y	N	
11	2394 Hogwarts Avenue	Y		
12	2039 Main Street	Y	N	
13	343 City Parkway	Y	N	
14	214 HR Avenue	N	N	
15	2395 Hogwarts Avenue	N	N	
16	121 Paper Avenue, Pennsylvania	Y	N	
17	3498 Super Lane	Y		
18			Y	
19	910 Tatooine Road, Tatooine	Y	N	

	Street Address	State	Zip	Street_Address
0	123 Shire Lane	Shire		123 Shire Lane
1	93 West Main Street			93 West Main Street
2	298 Drugs Driveway			298 Drugs Driveway
3	980 Paper Avenue	Pennsylvania	18503	980 Paper Avenue
4	123 Dragons Road			123 Dragons Road
5	768 City Parkway			768 City Parkway
6	1209 South Street			1209 South Street
7	98 Clue Drive			98 Clue Drive
8	123 Middle Earth			123 Middle Earth
9	25th Main Street	New York		25th Main Street
10	612 Shire Lane	Shire		612 Shire Lane
11	2394 Hogwarts Avenue			2394 Hogwarts Avenue
12	2039 Main Street			2039 Main Street
13	343 City Parkway			343 City Parkway
14	214 HR Avenue			214 HR Avenue
15	2395 Hogwarts Avenue			2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania		121 Paper Avenue
17	3498 Super Lane			3498 Super Lane
18				
19	910 Tatooine Road	Tatooine		910 Tatooine Road


```
[62]: for x in df.index:
      if df.loc[x,"Do_Not_Contact"]=='Y':
          df.drop(x,inplace=True)

df
```

```
[62]: CustomerID First_Name Last_Name Phone_Number \
0      1001      Frodo      Baggins 123-545-5421
2      1003      Walter      White
4      1005        Jon      Snow 876-678-3469
6      1007        Jeff      Winger
7      1008  Sherlock      Holmes 876-678-3469
8      1009    Gandalf
9      1010      Peter      Parker 123-545-5421
10     1011    Samwise      Gamgee
11     1012      Harry      Potter
12     1013        Don      Draper 123-543-2345
13     1014      Leslie      Knope 876-678-3469
14     1015        Toby  Flenderson 304-762-2467
15     1016        Ron      Weasley 123-545-5421
16     1017  Michael      Scott 123-643-9775
17     1018      Clark      Kent
19     1020    Anakin    Skywalker 876-678-3469
```

```
Address Paying Customer Do_Not_Contact \
0      123 Shire Lane, Shire      Y      N
2      298 Drugs Driveway      N
4      123 Dragons Road      Y      N
6      1209 South Street      N      N
7      98 Clue Drive      N      N
8      123 Middle Earth      Y
9      25th Main Street, New York      Y      N
10     612 Shire Lane, Shire      Y      N
11     2394 Hogwarts Avenue      Y
12     2039 Main Street      Y      N
13     343 City Parkway      Y      N
14     214 HR Avenue      N      N
15     2395 Hogwarts Avenue      N      N
16 121 Paper Avenue, Pennsylvania      Y      N
17     3498 Super Lane      Y
19     910 Tatooine Road, Tatooine      Y      N
```

```
Street Address      State Zip      Street_Address
0      123 Shire Lane      Shire      123 Shire Lane
2      298 Drugs Driveway      298 Drugs Driveway
4      123 Dragons Road      123 Dragons Road
6      1209 South Street      1209 South Street
```

7	98 Clue Drive		98 Clue Drive
8	123 Middle Earth		123 Middle Earth
9	25th Main Street	New York	25th Main Street
10	612 Shire Lane	Shire	612 Shire Lane
11	2394 Hogwarts Avenue		2394 Hogwarts Avenue
12	2039 Main Street		2039 Main Street
13	343 City Parkway		343 City Parkway
14	214 HR Avenue		214 HR Avenue
15	2395 Hogwarts Avenue		2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania	121 Paper Avenue
17	3498 Super Lane		3498 Super Lane
19	910 Tatooine Road	Tatooine	910 Tatooine Road

```
[63]: for x in df.index:
      if df.loc[x,"Phone_Number"]=="':
          df.drop(x,inplace=True)
```

df

```
[63]: CustomerID First_Name Last_Name Phone_Number \
0      1001      Frodo      Baggins 123-545-5421
4      1005        Jon        Snow 876-678-3469
7      1008  Sherlock      Holmes 876-678-3469
9      1010    Peter      Parker 123-545-5421
12     1013      Don      Draper 123-543-2345
13     1014    Leslie      Knope 876-678-3469
14     1015      Toby  Flenderson 304-762-2467
15     1016      Ron      Weasley 123-545-5421
16     1017  Michael      Scott 123-643-9775
19     1020    Anakin    Skywalker 876-678-3469
```

	Address	Paying Customer	Do_Not_Contact
0	123 Shire Lane, Shire	Y	N
4	123 Dragons Road	Y	N
7	98 Clue Drive	N	N
9	25th Main Street, New York	Y	N
12	2039 Main Street	Y	N
13	343 City Parkway	Y	N
14	214 HR Avenue	N	N
15	2395 Hogwarts Avenue	N	N
16	121 Paper Avenue, Pennsylvania	Y	N
19	910 Tatooine Road, Tatooine	Y	N

	Street Address	State Zip	Street_Address
0	123 Shire Lane	Shire	123 Shire Lane
4	123 Dragons Road		123 Dragons Road
7	98 Clue Drive		98 Clue Drive

9	25th Main Street	New York	25th Main Street
12	2039 Main Street		2039 Main Street
13	343 City Parkway		343 City Parkway
14	214 HR Avenue		214 HR Avenue
15	2395 Hogwarts Avenue		2395 Hogwarts Avenue
16	121 Paper Avenue	Pennsylvania	121 Paper Avenue
19	910 Tatooine Road	Tatooine	910 Tatooine Road

```
[66]: df.reset_index(drop=True)
```

```
[66]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	\
0	1001	Frodo	Baggins	123-545-5421	
1	1005	Jon	Snow	876-678-3469	
2	1008	Sherlock	Holmes	876-678-3469	
3	1010	Peter	Parker	123-545-5421	
4	1013	Don	Draper	123-543-2345	
5	1014	Leslie	Knope	876-678-3469	
6	1015	Toby	Flenderson	304-762-2467	
7	1016	Ron	Weasley	123-545-5421	
8	1017	Michael	Scott	123-643-9775	
9	1020	Anakin	Skywalker	876-678-3469	

	Address	Paying Customer	Do_Not_Contact	\
0	123 Shire Lane, Shire	Y	N	
1	123 Dragons Road	Y	N	
2	98 Clue Drive	N	N	
3	25th Main Street, New York	Y	N	
4	2039 Main Street	Y	N	
5	343 City Parkway	Y	N	
6	214 HR Avenue	N	N	
7	2395 Hogwarts Avenue	N	N	
8	121 Paper Avenue, Pennsylvania	Y	N	
9	910 Tatooine Road, Tatooine	Y	N	

	Street Address	State	Zip	Street_Address
0	123 Shire Lane		Shire	123 Shire Lane
1	123 Dragons Road			123 Dragons Road
2	98 Clue Drive			98 Clue Drive
3	25th Main Street	New York		25th Main Street
4	2039 Main Street			2039 Main Street
5	343 City Parkway			343 City Parkway
6	214 HR Avenue			214 HR Avenue
7	2395 Hogwarts Avenue			2395 Hogwarts Avenue
8	121 Paper Avenue	Pennsylvania		121 Paper Avenue
9	910 Tatooine Road	Tatooine		910 Tatooine Road

```
[ ]:
```