

Data Cleaning in Pandas

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

```
In [11]: pip install --upgrade pandas
```

```
Requirement already satisfied: pandas in c:\users\dell\anaconda3\lib\site-packages (2.2.2)  
Requirement already satisfied: numpy>=1.23.2 in c:\users\dell\anaconda3\lib\site-packages  
(from pandas) (1.26.4)  
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\dell\anaconda3\lib\site-p  
ackages (from pandas) (2.8.2)  
Requirement already satisfied: pytz>=2020.1 in c:\users\dell\anaconda3\lib\site-packages (f  
rom pandas) (2023.3.post1)  
Requirement already satisfied: tzdata>=2022.7 in c:\users\dell\anaconda3\lib\site-packages  
(from pandas) (2023.3)  
Requirement already satisfied: six>=1.5 in c:\users\dell\anaconda3\lib\site-packages (from  
python-dateutil>=2.8.2->pandas) (1.16.0)  
Note: you may need to restart the kernel to use updated packages.
```

```
In [2]: df=pd.read_excel(r"D:\COURSES\YOUTUBE\ALEX THE ANALYST\PYTHON\Customer Call List.xlsx")
```

In [3]: df

Out[3]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Not_Useful_Co
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Yes	No	
1	1002	Abed	Nadir	123/643/9775	93 West Main Street	No	Yes	
2	1003	Walter	/White	7066950392	298 Drugs Driveway	N	NaN	
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Yes	Y	
4	1005	Jon	Snow	876 678 3469	123 Dragons Road	Y	No	
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Yes	Yes	
6	1007	Jeff	Winger	NaN	1209 South Street	No	No	
7	1008	Sherlock	Holmes	876 678 3469	98 Clue Drive	N	No	
8	1009	Gandalf	NaN	N/a	123 Middle Earth	Yes	NaN	
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Yes	No	
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Yes	No	
11	1012	Harry	...Potter	7066950392	2394 Hogwarts Avenue	Y	NaN	
12	1013	Don	Draper	123-543-2345	2039 Main Street	Yes	N	
13	1014	Leslie	Knope	876 678 3469	343 City Parkway	Yes	No	
14	1015	Toby	Flenderson_	304-762-2467	214 HR Avenue	N	No	
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	No	N	
16	1017	Michael	Scott	123/643/9775	121 Paper Avenue, Pennsylvania	Yes	No	
17	1018	Clark	Kent	7066950392	3498 Super Lane	Y	NaN	
18	1019	Creed	Braton	N/a	N/a	N/a	Yes	
19	1020	Anakin	Skywalker	876 678 3469	910 Tatooine Road, Tatooine	Yes	N	
20	1020	Anakin	Skywalker	876 678 3469	910 Tatooine Road, Tatooine	Yes	N	

```
In [9]: df = df.drop_duplicates()
df
```

Out[9]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Not_Useful_Co
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	
1	1002	Abed	Nadir	123/643/9775	93 West Main Street	N	Y	
2	1003	Walter	/White	7066950392	298 Drugs Driveway	N	NaN	
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y	
4	1005	Jon	Snow	876 678 3469	123 Dragons Road	Y	N	
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y	
6	1007	Jeff	Winger	NaN	1209 South Street	N	N	
7	1008	Sherlock	Holmes	876 678 3469	98 Clue Drive	N	N	
8	1009	Gandalf	NaN	N/a	123 Middle Earth	Y	NaN	
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Y	N	
11	1012	Harry	...Potter	7066950392	2394 Hogwarts Avenue	Y	NaN	
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	
13	1014	Leslie	Knope	876 678 3469	343 City Parkway	Y	N	
14	1015	Toby	Flenderson_	304-762-2467	214 HR Avenue	N	N	
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	
16	1017	Michael	Scott	123/643/9775	121 Paper Avenue, Pennsylvania	Y	N	
17	1018	Clark	Kent	7066950392	3498 Super Lane	Y	NaN	
18	1019	Creed	Braton	N/a	N/a	N/a	Y	
19	1020	Anakin	Skywalker	876 678 3469	910 Tatooine Road, Tatooine	Y	N	

```
In [10]: df = df.drop(columns = "Not_Useful_Column")
df
```

Out[10]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N
1	1002	Abed	Nadir	123/643/9775	93 West Main Street	N	Y
2	1003	Walter	/White	7066950392	298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y
4	1005	Jon	Snow	876 678 3469	123 Dragons Road	Y	N
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y
6	1007	Jeff	Winger	NaN	1209 South Street	N	N
7	1008	Sherlock	Holmes	876 678 3469	98 Clue Drive	N	N
8	1009	Gandalf	NaN	N/a	123 Middle Earth	Y	NaN
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Y	N
11	1012	Harry	...Potter	7066950392	2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N
13	1014	Leslie	Knope	876 678 3469	343 City Parkway	Y	N
14	1015	Toby	Flenderson_	304-762-2467	214 HR Avenue	N	N
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N
16	1017	Michael	Scott	123/643/9775	121 Paper Avenue, Pennsylvania	Y	N
17	1018	Clark	Kent	7066950392	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	N/a	N/a	N/a	Y
19	1020	Anakin	Skywalker	876 678 3469	910 Tatooine Road, Tatooine	Y	N

```
In [11]: #By default strip will only replace spaces. so we need to specify values
#Below is one method to use strip
#df["Last_Name"] = df["Last_Name"].str.lstrip("...")
#df["Last_Name"] = df["Last_Name"].str.lstrip("/")
#df["Last_Name"] = df["Last_Name"].str.rstrip("_")

#But we can put it all together in one list with proper syntax
df["Last_Name"] = df["Last_Name"].str.strip("123._/")
df
```

Out[11]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N
1	1002	Abed	Nadir	123/643/9775	93 West Main Street	N	Y
2	1003	Walter	White	7066950392	298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y
4	1005	Jon	Snow	876 678 3469	123 Dragons Road	Y	N
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y
6	1007	Jeff	Winger	NaN	1209 South Street	N	N
7	1008	Sherlock	Holmes	876 678 3469	98 Clue Drive	N	N
8	1009	Gandalf	NaN	N/a	123 Middle Earth	Y	NaN
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Y	N
11	1012	Harry	Potter	7066950392	2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N
13	1014	Leslie	Knope	876 678 3469	343 City Parkway	Y	N
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N
16	1017	Michael	Scott	123/643/9775	121 Paper Avenue, Pennsylvania	Y	N
17	1018	Clark	Kent	7066950392	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	N/a	N/a	N/a	Y
19	1020	Anakin	Skywalker	876 678 3469	910 Tatooine Road, Tatooine	Y	N

```
In [13]: df['Phone_Number']=df['Phone_Number'].str.replace('[^a-zA-Z0-9]', '', regex=True)
df
```

Out[13]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	1235455421	123 Shire Lane, Shire	Y	N
1	1002	Abed	Nadir	1236439775	93 West Main Street	N	Y
2	1003	Walter	White	NaN	298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	1235432345	980 Paper Avenue, Pennsylvania, 18503	Y	Y
4	1005	Jon	Snow	8766783469	123 Dragons Road	Y	N
5	1006	Ron	Swanson	3047622467	768 City Parkway	Y	Y
6	1007	Jeff	Winger	NaN	1209 South Street	N	N
7	1008	Sherlock	Holmes	8766783469	98 Clue Drive	N	N
8	1009	Gandalf	NaN	Na	123 Middle Earth	Y	NaN
9	1010	Peter	Parker	1235455421	25th Main Street, New York	Y	N
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Y	N
11	1012	Harry	Potter	NaN	2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	1235432345	2039 Main Street	Y	N
13	1014	Leslie	Knope	8766783469	343 City Parkway	Y	N
14	1015	Toby	Flenderson	3047622467	214 HR Avenue	N	N
15	1016	Ron	Weasley	1235455421	2395 Hogwarts Avenue	N	N
16	1017	Michael	Scott	1236439775	121 Paper Avenue, Pennsylvania	Y	N
17	1018	Clark	Kent	NaN	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	Na	N/a	N/a	Y
19	1020	Anakin	Skywalker	8766783469	910 Tatooine Road, Tatooine	Y	N

```
In [14]: df['Phone_Number']= df['Phone_Number'].apply(lambda x: str(x))
```

```
In [15]: df['Phone_Number'] = df['Phone_Number'].apply(lambda x: x[0:3]+'-' + x[3:6] + '-' + x[6:10])
df
```

Out[15]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	N	Y
2	1003	Walter	White	nan--	298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y
6	1007	Jeff	Winger	nan--	1209 South Street	N	N
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N
8	1009	Gandalf	NaN	Na--	123 Middle Earth	Y	NaN
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N
10	1011	Samwise	Gamgee	nan--	612 Shire Lane, Shire	Y	N
11	1012	Harry	Potter	nan--	2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N
17	1018	Clark	Kent	nan--	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	Na--	N/a	N/a	Y
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N

```
In [16]: df['Phone_Number'] = df['Phone_Number'].str.replace('nan--', '')
```

```
In [17]: df['Phone_Number'] = df['Phone_Number'].str.replace('Na--', '')
```

In [18]:

df

Out[18]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	N	Y
2	1003	Walter	White		298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y
6	1007	Jeff	Winger		1209 South Street	N	N
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N
8	1009	Gandalf	NaN		123 Middle Earth	Y	NaN
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Y	N
11	1012	Harry	Potter		2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N
17	1018	Clark	Kent		3498 Super Lane	Y	NaN
18	1019	Creed	Braton		N/a	N/a	Y
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N


```
In [19]: df[["Street_Address", "State", "Zip_Code"]] = df["Address"].str.split(' ', n=2, expand=True)
df
```

Out[19]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	N	Y	93 West Main Street
2	1003	Walter	White		298 Drugs Driveway	N	NaN	298 Drugs Driveway
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y	980 Paper Avenue
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y	768 City Parkway
6	1007	Jeff	Winger		1209 South Street	N	N	1209 South Street
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive
8	1009	Gandalf	NaN		123 Middle Earth	Y	NaN	123 Middle Earth
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Y	N	612 Shire Lane
11	1012	Harry	Potter		2394 Hogwarts Avenue	Y	NaN	2394 Hogwarts Avenue
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue
17	1018	Clark	Kent		3498 Super Lane	Y	NaN	3498 Super Lane
18	1019	Creed	Braton		N/a	N/a	Y	N/a
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road

```
In [20]: df['Paying Customer'] = df['Paying Customer'].str.replace('Yes', 'Y')
```

```
In [21]: df['Paying Customer'] = df['Paying Customer'].str.replace('No', 'N')
```

In [22]: df

Out[22]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	N	Y	93 West Main Street
2	1003	Walter	White		298 Drugs Driveway	N	NaN	298 Drugs Driveway
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y	980 Paper Avenue
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y	768 City Parkway
6	1007	Jeff	Winger		1209 South Street	N	N	1209 South Street
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive
8	1009	Gandalf	NaN		123 Middle Earth	Y	NaN	123 Middle Earth
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Y	N	612 Shire Lane
11	1012	Harry	Potter		2394 Hogwarts Avenue	Y	NaN	2394 Hogwarts Avenue
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue
17	1018	Clark	Kent		3498 Super Lane	Y	NaN	3498 Super Lane
18	1019	Creed	Braton		N/a	N/a	Y	N/a
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road

```
In [23]: df['Do_Not_Contact'] = df['Do_Not_Contact'].str.replace('Yes', 'Y')
df['Do_Not_Contact'] = df['Do_Not_Contact'].str.replace('No', 'N')
```

```
In [24]: df
```

```
Out[24]:
```

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	N	Y	93 West Main Street
2	1003	Walter	White		298 Drugs Driveway	N	NaN	298 Drugs Driveway
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y	980 Paper Avenue
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Y	Y	768 City Parkway
6	1007	Jeff	Winger		1209 South Street	N	N	1209 South Street
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive
8	1009	Gandalf	NaN		123 Middle Earth	Y	NaN	123 Middle Earth
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Y	N	612 Shire Lane
11	1012	Harry	Potter		2394 Hogwarts Avenue	Y	NaN	2394 Hogwarts Avenue
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue
17	1018	Clark	Kent		3498 Super Lane	Y	NaN	3498 Super Lane
18	1019	Creed	Braton		N/a	N/a	Y	N/a
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road

```
In [25]: df=df.replace('N/a','')
```

```
In [26]: df=df.fillna('')
```

```
In [27]: df
```

```
Out[27]:
```

First_Name	Last_Name	Phone_Number	Address	Paying_Customer	Do_Not_Contact	Street_Address	State	Zip_Code
Arwen	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane	Shire	
Alfred	Nadir	123-643-9775	93 West Main Street	N	Y	93 West Main Street		
Alter	White		298 Drugs Driveway	N		298 Drugs Driveway		
Archie	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Y	Y	980 Paper Avenue	Pennsylvania	18503
Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road		
Ron	Swanson	304-762-2467	768 City Parkway	Y	Y	768 City Parkway		
Jeff	Winger		1209 South Street	N	N	1209 South Street		
Lock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive		
Idalf			123 Middle Earth	Y		123 Middle Earth		
Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street	New York	
Arwen	Gamgee		612 Shire Lane, Shire	Y	N	612 Shire Lane	Shire	
Harry	Potter		2394 Hogwarts Avenue	Y		2394 Hogwarts Avenue		
Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street		
Aslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway		
Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue		
Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue		
Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue	Pennsylvania	
Clark	Kent		3498 Super Lane	Y		3498 Super Lane		
Reed	Braton				Y			
Lakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road	Tatooine	

```
In [28]: for x in df.index:
        if df.loc[x, "Do_Not_Contact"] == 'Y':
            df.drop(x, inplace = True)
df
```

Out[28]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane
2	1003	Walter	White		298 Drugs Driveway	N		298 Drugs Driveway
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road
6	1007	Jeff	Winger		1209 South Street	N	N	1209 South Street
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive
8	1009	Gandalf			123 Middle Earth	Y		123 Middle Earth
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Y	N	612 Shire Lane
11	1012	Harry	Potter		2394 Hogwarts Avenue	Y		2394 Hogwarts Avenue
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue
17	1018	Clark	Kent		3498 Super Lane	Y		3498 Super Lane
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road

```
In [29]: for x in df.index:
          if df.loc[x, "Phone_Number"] == '':
              df.drop(x, inplace = True)

df

#Another way to drop null values
#df=df.dropna((subset="Phone_Number"),inplace=True)
```

Out[29]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street
12	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road

In [30]: `df=df.reset_index(drop=True)`
`df`

Out[30]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Y	N	123 Shire Lane
1	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	N	123 Dragons Road
2	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	N	98 Clue Drive
3	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Y	N	25th Main Street
4	1013	Don	Draper	123-543-2345	2039 Main Street	Y	N	2039 Main Street
5	1014	Leslie	Knope	876-678-3469	343 City Parkway	Y	N	343 City Parkway
6	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	N	214 HR Avenue
7	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	N	N	2395 Hogwarts Avenue
8	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Y	N	121 Paper Avenue
9	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Y	N	910 Tatooine Road

In []: