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

```python
In [2]: data = pd.read_excel('Customer Call List.xlsx')
        # Read the data from local
        data
```

Out[2]:

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

```
In [3]: data.isnull().sum()
        # check for Null values
```

```
Out[3]: CustomerID          0
        First_Name          0
        Last_Name           1
        Phone_Number        2
        Address             0
        Paying Customer     0
        Do_Not_Contact      4
        Not_Useful_Column   0
        dtype: int64
```

```
In [4]: data.dtypes
        # check for data types
```

```
Out[4]: CustomerID           int64
        First_Name          object
        Last_Name           object
        Phone_Number        object
        Address             object
        Paying Customer     object
        Do_Not_Contact      object
        Not_Useful_Column     bool
        dtype: object
```

```
In [5]: data = data.drop(columns='Not_Useful_Column')
        # Drop unwanted column
```

```
In [7]: data
        # After dropping column 'Not_Useful_Column'
```

Out[7]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
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]: data['Last_Name'] = data['Last_Name'].str.replace('/', '')
        data['Last_Name'] = data['Last_Name'].str.replace('...', '')
        data['Last_Name'] = data['Last_Name'].str.replace('_', '')
        # Removing unwanted special characters for 'Last_Name' column
        data
```

Out[9]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	1235455421	123 Shire Lane, Shire	Yes	No
1	1002	Abed	Nadir	1236439775	93 West Main Street	No	Yes
2	1003	Walter	White	NaN	298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	1235432345	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	1005	Jon	Snow	8766783469	123 Dragons Road	Y	No
5	1006	Ron	Swanson	3047622467	768 City Parkway	Yes	Yes
6	1007	Jeff	Winger	NaN	1209 South Street	No	No
7	1008	Sherlock	Holmes	8766783469	98 Clue Drive	N	No
8	1009	Gandalf	NaN	Na	123 Middle Earth	Yes	NaN
9	1010	Peter	Parker	1235455421	25th Main Street, New York	Yes	No
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Yes	No
11	1012	Harry	Potter	NaN	2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	1235432345	2039 Main Street	Yes	N
13	1014	Leslie	Knope	8766783469	343 City Parkway	Yes	No
14	1015	Toby	Flenderson	3047622467	214 HR Avenue	N	No
15	1016	Ron	Weasley	1235455421	2395 Hogwarts Avenue	No	N
16	1017	Michael	Scott	1236439775	121 Paper Avenue, Pennsylvania	Yes	No
17	1018	Clark	Kent	NaN	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	Na	N/a	N/a	Yes
19	1020	Anakin	Skywalker	8766783469	910 Tatooine Road, Tatooine	Yes	N
20	1020	Anakin	Skywalker	8766783469	910 Tatooine Road, Tatooine	Yes	N

```
In [8]: data['Phone_Number'] = data['Phone_Number'].str.replace('/', '')
        data['Phone_Number'] = data['Phone_Number'].str.replace('-', '')
        data['Phone_Number'] = data['Phone_Number'].str.replace('|', '')
        # Removing unwanted special characters for 'Phone_Number' column
        data
```

Out[8]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
0	1001	Frodo	Baggins	1235455421	123 Shire Lane, Shire	Yes	No
1	1002	Abed	Nadir	1236439775	93 West Main Street	No	Yes
2	1003	Walter	/White	NaN	298 Drugs Driveway	N	NaN
3	1004	Dwight	Schrute	1235432345	980 Paper Avenue, Pennsylvania, 18503	Yes	Y
4	1005	Jon	Snow	8766783469	123 Dragons Road	Y	No
5	1006	Ron	Swanson	3047622467	768 City Parkway	Yes	Yes
6	1007	Jeff	Winger	NaN	1209 South Street	No	No
7	1008	Sherlock	Holmes	8766783469	98 Clue Drive	N	No
8	1009	Gandalf	NaN	Na	123 Middle Earth	Yes	NaN
9	1010	Peter	Parker	1235455421	25th Main Street, New York	Yes	No
10	1011	Samwise	Gamgee	NaN	612 Shire Lane, Shire	Yes	No
11	1012	Harry	...Potter	NaN	2394 Hogwarts Avenue	Y	NaN
12	1013	Don	Draper	1235432345	2039 Main Street	Yes	N
13	1014	Leslie	Knope	8766783469	343 City Parkway	Yes	No
14	1015	Toby	Flenderson_	3047622467	214 HR Avenue	N	No
15	1016	Ron	Weasley	1235455421	2395 Hogwarts Avenue	No	N
16	1017	Michael	Scott	1236439775	121 Paper Avenue, Pennsylvania	Yes	No
17	1018	Clark	Kent	NaN	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	Na	N/a	N/a	Yes
19	1020	Anakin	Skywalker	8766783469	910 Tatooine Road, Tatooine	Yes	N
20	1020	Anakin	Skywalker	8766783469	910 Tatooine Road, Tatooine	Yes	N

```
In [11]: data['Phone_Number'] = data['Phone_Number'].apply(lambda x: str(x))
         # converting 'Phone_Number' column into string to avoid error while formating the phone numbers
         # ex. 1234567899 -> 123-456-7899
```

```
In [14]: data['Phone_Number'] = data['Phone_Number'].apply(lambda x: x[0:3] + '-' + x[3:6] + '-' + x[6:10])
         # Formating the phone numbers
```

```
In [15]: data
```

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	Yes	No
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	No	Yes
2	1003	Walter	White	nan--	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	Na--	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	nan--	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	nan--	3498 Super Lane	Y	NaN
18	1019	Creed	Braton	Na--	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 [17]: data['Phone_Number'] = data['Phone_Number'].str.replace('nan--', '')
         data['Phone_Number'] = data['Phone_Number'].str.replace('Na--', '')
         # Removing NaN values from 'Phone_Number' column
         data
```

Out[17]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact
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		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		1209 South Street	No	No
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	No
8	1009	Gandalf	NaN		123 Middle Earth	Yes	NaN
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Yes	No
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Yes	No
11	1012	Harry	Potter		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		3498 Super Lane	Y	NaN
18	1019	Creed	Braton		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 [26]: data['Address'].str.split(',', expand=True)
         # Splitting the 'Address' column by comma separated
```

Out[26]:

	0	1	2
0	123 Shire Lane	Shire	None
1	93 West Main Street	None	None
2	298 Drugs Driveway	None	None
3	980 Paper Avenue	Pennsylvania	18503
4	123 Dragons Road	None	None
5	768 City Parkway	None	None
6	1209 South Street	None	None
7	98 Clue Drive	None	None
8	123 Middle Earth	None	None
9	25th Main Street	New York	None
10	612 Shire Lane	Shire	None
11	2394 Hogwarts Avenue	None	None
12	2039 Main Street	None	None
13	343 City Parkway	None	None
14	214 HR Avenue	None	None
15	2395 Hogwarts Avenue	None	None
16	121 Paper Avenue	Pennsylvania	None
17	3498 Super Lane	None	None
18	N/a	None	None
19	910 Tatooine Road	Tatooine	None
20	910 Tatooine Road	Tatooine	None

```
In [27]: data[['Street_Address', 'State', 'Zip_Code']] = data['Address'].str.split(',', expand=True)
         # Create columns and Append splitted Address into actual Dataframe
         data
```

Out[27]:

	CustomerID	First_Name	Last_Name	Phone_Number	Address	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	123 Shire Lane, Shire	Yes	No	123 Shire Lane	Shire	None
1	1002	Abed	Nadir	123-643-9775	93 West Main Street	No	Yes	93 West Main Street	None	None
2	1003	Walter	White		298 Drugs Driveway	N	NaN	298 Drugs Driveway	None	None
3	1004	Dwight	Schrute	123-543-2345	980 Paper Avenue, Pennsylvania, 18503	Yes	Y	980 Paper Avenue	Pennsylvania	18503
4	1005	Jon	Snow	876-678-3469	123 Dragons Road	Y	No	123 Dragons Road	None	None
5	1006	Ron	Swanson	304-762-2467	768 City Parkway	Yes	Yes	768 City Parkway	None	None
6	1007	Jeff	Winger		1209 South Street	No	No	1209 South Street	None	None
7	1008	Sherlock	Holmes	876-678-3469	98 Clue Drive	N	No	98 Clue Drive	None	None
8	1009	Gandalf	NaN		123 Middle Earth	Yes	NaN	123 Middle Earth	None	None
9	1010	Peter	Parker	123-545-5421	25th Main Street, New York	Yes	No	25th Main Street	New York	None
10	1011	Samwise	Gamgee		612 Shire Lane, Shire	Yes	No	612 Shire Lane	Shire	None
11	1012	Harry	Potter		2394 Hogwarts Avenue	Y	NaN	2394 Hogwarts Avenue	None	None
12	1013	Don	Draper	123-543-2345	2039 Main Street	Yes	N	2039 Main Street	None	None
13	1014	Leslie	Knope	876-678-3469	343 City Parkway	Yes	No	343 City Parkway	None	None
14	1015	Toby	Flenderson	304-762-2467	214 HR Avenue	N	No	214 HR Avenue	None	None
15	1016	Ron	Weasley	123-545-5421	2395 Hogwarts Avenue	No	N	2395 Hogwarts Avenue	None	None
16	1017	Michael	Scott	123-643-9775	121 Paper Avenue, Pennsylvania	Yes	No	121 Paper Avenue	Pennsylvania	None
17	1018	Clark	Kent		3498 Super Lane	Y	NaN	3498 Super Lane	None	None
18	1019	Creed	Braton		N/a	N/a	Yes	N/a	None	None
19	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Yes	N	910 Tatooine Road	Tatooine	None
20	1020	Anakin	Skywalker	876-678-3469	910 Tatooine Road, Tatooine	Yes	N	910 Tatooine Road	Tatooine	None

```
In [28]: data = data.drop(columns='Address')
         # Dropping 'Address' column, as we don't need it anymore
         data
```

Out[28]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	Yes	No	123 Shire Lane	Shire	None
1	1002	Abed	Nadir	123-643-9775	No	Yes	93 West Main Street	None	None
2	1003	Walter	White		N	NaN	298 Drugs Driveway	None	None
3	1004	Dwight	Schrute	123-543-2345	Yes	Y	980 Paper Avenue	Pennsylvania	18503
4	1005	Jon	Snow	876-678-3469	Y	No	123 Dragons Road	None	None
5	1006	Ron	Swanson	304-762-2467	Yes	Yes	768 City Parkway	None	None
6	1007	Jeff	Winger		No	No	1209 South Street	None	None
7	1008	Sherlock	Holmes	876-678-3469	N	No	98 Clue Drive	None	None
8	1009	Gandalf	NaN		Yes	NaN	123 Middle Earth	None	None
9	1010	Peter	Parker	123-545-5421	Yes	No	25th Main Street	New York	None
10	1011	Samwise	Gamgee		Yes	No	612 Shire Lane	Shire	None
11	1012	Harry	Potter		Y	NaN	2394 Hogwarts Avenue	None	None
12	1013	Don	Draper	123-543-2345	Yes	N	2039 Main Street	None	None
13	1014	Leslie	Knope	876-678-3469	Yes	No	343 City Parkway	None	None
14	1015	Toby	Flenderson	304-762-2467	N	No	214 HR Avenue	None	None
15	1016	Ron	Weasley	123-545-5421	No	N	2395 Hogwarts Avenue	None	None
16	1017	Michael	Scott	123-643-9775	Yes	No	121 Paper Avenue	Pennsylvania	None
17	1018	Clark	Kent		Y	NaN	3498 Super Lane	None	None
18	1019	Creed	Braton		N/a	Yes	N/a	None	None
19	1020	Anakin	Skywalker	876-678-3469	Yes	N	910 Tatooine Road	Tatooine	None
20	1020	Anakin	Skywalker	876-678-3469	Yes	N	910 Tatooine Road	Tatooine	None

```
In [45]: data['Paying Customer'] = data['Paying Customer'].str.replace('Yes', 'Y')
         data['Paying Customer'] = data['Paying Customer'].str.replace('No', 'N')
         # Formating Yes and No in 'Paying Customer'
         data
```

Out[45]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	Y	No	123 Shire Lane	Shire	None
1	1002	Abed	Nadir	123-643-9775	N	Yes	93 West Main Street	None	None
2	1003	Walter	White		N	NaN	298 Drugs Driveway	None	None
3	1004	Dwight	Schrute	123-543-2345	Y	Y	980 Paper Avenue	Pennsylvania	18503
4	1005	Jon	Snow	876-678-3469	Y	No	123 Dragons Road	None	None
5	1006	Ron	Swanson	304-762-2467	Y	Yes	768 City Parkway	None	None
6	1007	Jeff	Winger		N	No	1209 South Street	None	None
7	1008	Sherlock	Holmes	876-678-3469	N	No	98 Clue Drive	None	None
8	1009	Gandalf	NaN		Y	NaN	123 Middle Earth	None	None
9	1010	Peter	Parker	123-545-5421	Y	No	25th Main Street	New York	None
10	1011	Samwise	Gamgee		Y	No	612 Shire Lane	Shire	None
11	1012	Harry	Potter		Y	NaN	2394 Hogwarts Avenue	None	None
12	1013	Don	Draper	123-543-2345	Y	N	2039 Main Street	None	None
13	1014	Leslie	Knope	876-678-3469	Y	No	343 City Parkway	None	None
14	1015	Toby	Flenderson	304-762-2467	N	No	214 HR Avenue	None	None
15	1016	Ron	Weasley	123-545-5421	N	N	2395 Hogwarts Avenue	None	None
16	1017	Michael	Scott	123-643-9775	Y	No	121 Paper Avenue	Pennsylvania	None
17	1018	Clark	Kent		Y	NaN	3498 Super Lane	None	None
18	1019	Creed	Braton		N/a	Yes	N/a	None	None
19	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	None
20	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	None

```
In [46]: data['Do_Not_Contact'] = data['Do_Not_Contact'].str.replace('Yes', 'Y')
         data['Do_Not_Contact'] = data['Do_Not_Contact'].str.replace('No', 'N')
         data
```

Out[46]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	Y	N	123 Shire Lane	Shire	None
1	1002	Abed	Nadir	123-643-9775	N	Y	93 West Main Street	None	None
2	1003	Walter	White		N	NaN	298 Drugs Driveway	None	None
3	1004	Dwight	Schrute	123-543-2345	Y	Y	980 Paper Avenue	Pennsylvania	18503
4	1005	Jon	Snow	876-678-3469	Y	N	123 Dragons Road	None	None
5	1006	Ron	Swanson	304-762-2467	Y	Y	768 City Parkway	None	None
6	1007	Jeff	Winger		N	N	1209 South Street	None	None
7	1008	Sherlock	Holmes	876-678-3469	N	N	98 Clue Drive	None	None
8	1009	Gandalf	NaN		Y	NaN	123 Middle Earth	None	None
9	1010	Peter	Parker	123-545-5421	Y	N	25th Main Street	New York	None
10	1011	Samwise	Gamgee		Y	N	612 Shire Lane	Shire	None
11	1012	Harry	Potter		Y	NaN	2394 Hogwarts Avenue	None	None
12	1013	Don	Draper	123-543-2345	Y	N	2039 Main Street	None	None
13	1014	Leslie	Knope	876-678-3469	Y	N	343 City Parkway	None	None
14	1015	Toby	Flenderson	304-762-2467	N	N	214 HR Avenue	None	None
15	1016	Ron	Weasley	123-545-5421	N	N	2395 Hogwarts Avenue	None	None
16	1017	Michael	Scott	123-643-9775	Y	N	121 Paper Avenue	Pennsylvania	None
17	1018	Clark	Kent		Y	NaN	3498 Super Lane	None	None
18	1019	Creed	Braton		N/a	Y	N/a	None	None
19	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	None
20	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	None

```
In [47]: data = data.fillna('')
         # Filling up NaN, None values as empty
         data
```

Out[47]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	Y	N	123 Shire Lane	Shire	
1	1002	Abed	Nadir	123-643-9775	N	Y	93 West Main Street		
2	1003	Walter	White			N	298 Drugs Driveway		
3	1004	Dwight	Schrute	123-543-2345	Y	Y	980 Paper Avenue	Pennsylvania	18503
4	1005	Jon	Snow	876-678-3469	Y	N	123 Dragons Road		
5	1006	Ron	Swanson	304-762-2467	Y	Y	768 City Parkway		
6	1007	Jeff	Winger		N	N	1209 South Street		
7	1008	Sherlock	Holmes	876-678-3469	N	N	98 Clue Drive		
8	1009	Gandalf			Y		123 Middle Earth		
9	1010	Peter	Parker	123-545-5421	Y	N	25th Main Street	New York	
10	1011	Samwise	Gamgee		Y	N	612 Shire Lane	Shire	
11	1012	Harry	Potter		Y		2394 Hogwarts Avenue		
12	1013	Don	Draper	123-543-2345	Y	N	2039 Main Street		
13	1014	Leslie	Knope	876-678-3469	Y	N	343 City Parkway		
14	1015	Toby	Flenderson	304-762-2467	N	N	214 HR Avenue		
15	1016	Ron	Weasley	123-545-5421	N	N	2395 Hogwarts Avenue		
16	1017	Michael	Scott	123-643-9775	Y	N	121 Paper Avenue	Pennsylvania	
17	1018	Clark	Kent		Y		3498 Super Lane		
18	1019	Creed	Braton		N/a	Y	N/a		
19	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	
20	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	

```
In [49]: for drop_yes in data.index:
             if data.loc[drop_yes, 'Do_Not_Contact'] == 'Y':
                 data.drop(drop_yes, inplace=True)
         # Dropping Customers, who we not gonna call again
         data
```

Out[49]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	Y	N	123 Shire Lane	Shire	
2	1003	Walter	White		N		298 Drugs Driveway		
4	1005	Jon	Snow	876-678-3469	Y	N	123 Dragons Road		
6	1007	Jeff	Winger		N	N	1209 South Street		
7	1008	Sherlock	Holmes	876-678-3469	N	N	98 Clue Drive		
8	1009	Gandalf			Y		123 Middle Earth		
9	1010	Peter	Parker	123-545-5421	Y	N	25th Main Street	New York	
10	1011	Samwise	Gamgee		Y	N	612 Shire Lane	Shire	
11	1012	Harry	Potter		Y		2394 Hogwarts Avenue		
12	1013	Don	Draper	123-543-2345	Y	N	2039 Main Street		
13	1014	Leslie	Knope	876-678-3469	Y	N	343 City Parkway		
14	1015	Toby	Flenderson	304-762-2467	N	N	214 HR Avenue		
15	1016	Ron	Weasley	123-545-5421	N	N	2395 Hogwarts Avenue		
16	1017	Michael	Scott	123-643-9775	Y	N	121 Paper Avenue	Pennsylvania	
17	1018	Clark	Kent		Y		3498 Super Lane		
19	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	
20	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	

```
In [50]:  for empty_numbers in data.index:
              if data.loc[empty_numbers, 'Phone_Number'] == '':
                  data.drop(empty_numbers, inplace=True)
          # Dropping Customers, who's phone numbers doesn't exists
          data

          # Another way to drop Customers, who's phone numbers doesn't exists
          # data = data.dropna(subset='Phone_Number'), inplace=True)
```

Out[50]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State	Zip_Code
0	1001	Frodo	Baggins	123-545-5421	Y	N	123 Shire Lane	Shire	
4	1005	Jon	Snow	876-678-3469	Y	N	123 Dragons Road		
7	1008	Sherlock	Holmes	876-678-3469	N	N	98 Clue Drive		
9	1010	Peter	Parker	123-545-5421	Y	N	25th Main Street	New York	
12	1013	Don	Draper	123-543-2345	Y	N	2039 Main Street		
13	1014	Leslie	Knope	876-678-3469	Y	N	343 City Parkway		
14	1015	Toby	Flenderson	304-762-2467	N	N	214 HR Avenue		
15	1016	Ron	Weasley	123-545-5421	N	N	2395 Hogwarts Avenue		
16	1017	Michael	Scott	123-643-9775	Y	N	121 Paper Avenue	Pennsylvania	
19	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	
20	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine	

```
In [51]: data = data.drop(columns= 'Zip_Code')
         # Drop 'Zip_Code' column
         data
```

Out[51]:

	CustomerID	First_Name	Last_Name	Phone_Number	Paying Customer	Do_Not_Contact	Street_Address	State
0	1001	Frodo	Baggins	123-545-5421	Y	N	123 Shire Lane	Shire
4	1005	Jon	Snow	876-678-3469	Y	N	123 Dragons Road	
7	1008	Sherlock	Holmes	876-678-3469	N	N	98 Clue Drive	
9	1010	Peter	Parker	123-545-5421	Y	N	25th Main Street	New York
12	1013	Don	Draper	123-543-2345	Y	N	2039 Main Street	
13	1014	Leslie	Knope	876-678-3469	Y	N	343 City Parkway	
14	1015	Toby	Flenderson	304-762-2467	N	N	214 HR Avenue	
15	1016	Ron	Weasley	123-545-5421	N	N	2395 Hogwarts Avenue	
16	1017	Michael	Scott	123-643-9775	Y	N	121 Paper Avenue	Pennsylvania
19	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine
20	1020	Anakin	Skywalker	876-678-3469	Y	N	910 Tatooine Road	Tatooine

```
In [52]: data = data.drop_duplicates()
         # Drop duplicates, forgot to do it at initial
         data
```

Out[52]:

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

```
In [53]: data = data.reset_index(drop=True)
         # Resetting the index values
         data
```

Out[53]:

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

```
In [ ]:
```