ptksretbn

June 24, 2023

```
import pandas as pd
[8]: df=pd.read_excel(r"C:\Users\nvdsd\Downloads\Customer Call List.xlsx")
[8]:
         CustomerID First_Name
                                     Last_Name
                                                 Phone_Number
     0
                1001
                           Frodo
                                       Baggins
                                                 123-545-5421
                1002
     1
                            Abed
                                          Nadir
                                                 123/643/9775
     2
                1003
                          Walter
                                         /White
                                                    7066950392
     3
                1004
                                       Schrute
                                                 123-543-2345
                          Dwight
     4
                1005
                              Jon
                                           Snow
                                                  876 | 678 | 3469
     5
                1006
                                       Swanson
                                                  304-762-2467
                             Ron
     6
                1007
                             Jeff
                                         Winger
                                                           NaN
     7
                1008
                        Sherlock
                                         Holmes
                                                 876 | 678 | 3469
     8
                1009
                         Gandalf
                                            NaN
                                                           N/a
     9
                1010
                           Peter
                                                  123-545-5421
                                         Parker
     10
                1011
                         Samwise
                                         Gamgee
                                                           NaN
                1012
                                     ...Potter
     11
                           Harry
                                                  7066950392
     12
                1013
                                         Draper
                                                 123-543-2345
                             Don
     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
                                                           N/a
                           Creed
                                         Braton
     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
     1
                             93 West Main Street
                                                                  No
                                                                                  Yes
     2
                               298 Drugs Driveway
                                                                   N
                                                                                  NaN
                                                                                    Y
     3
         980 Paper Avenue, Pennsylvania, 18503
                                                                 Yes
     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]: df=df.drop_duplicates() df

11

12

13

14

15

16

17

18

19

20

```
Last_Name
                                                 Phone_Number
[11]:
          CustomerID First_Name
                                       Baggins
                           Frodo
                                                 123-545-5421
      0
                 1001
      1
                 1002
                             Abed
                                          Nadir
                                                 123/643/9775
      2
                 1003
                          Walter
                                        /White
                                                   7066950392
      3
                 1004
                                       Schrute
                          Dwight
                                                 123-543-2345
      4
                 1005
                              Jon
                                           Snow
                                                 876 | 678 | 3469
      5
                 1006
                              Ron
                                       Swanson
                                                 304-762-2467
```

True

False

False

False

False

False

True

True

True

True

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	${\tt Gamgee}$	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 NaN3 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 612 Shire Lane, Shire 10 Yes No 11 2394 Hogwarts Avenue Y NaN 12 2039 Main Street Yes N 13 No 343 City Parkway Yes 14 214 HR Avenue N No 15 2395 Hogwarts Avenue No N 16 121 Paper Avenue, Pennsylvania Yes No 17 3498 Super Lane Y NaN18 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
                        False
      14
      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
                            Frodo
                                                   123-545-5421
                 1001
                                         Baggins
      0
      1
                  1002
                              Abed
                                           Nadir
                                                   123/643/9775
      2
                  1003
                           Walter
                                          /White
                                                     7066950392
      3
                  1004
                                         Schrute
                           Dwight
                                                   123-543-2345
      4
                  1005
                               Jon
                                            Snow
                                                   876 | 678 | 3469
                                                   304-762-2467
      5
                  1006
                               Ron
                                         Swanson
      6
                  1007
                              Jeff
                                          Winger
                                                             NaN
      7
                                                   876 | 678 | 3469
                  1008
                         Sherlock
                                          Holmes
      8
                  1009
                          Gandalf
                                             NaN
                                                             N/a
      9
                                                   123-545-5421
                  1010
                            Peter
                                          Parker
      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
                                           Scott
                                                   123/643/9775
                  1017
                         Michael
      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
                                                                                     Y
                                                                   Yes
      4
                                  123 Dragons Road
                                                                     Y
                                                                                    No
      5
                                  768 City Parkway
                                                                   Yes
                                                                                   Yes
      6
                                 1209 South Street
                                                                    No
                                                                                    No
```

N

Yes

No

NaN

98 Clue Drive

123 Middle Earth

7

8

```
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
                                     214 HR Avenue
      14
                                                                   N
                                                                                   No
      15
                             2395 Hogwarts Avenue
                                                                  No
                                                                                   N
      16
                  121 Paper Avenue, Pennsylvania
                                                                 Yes
                                                                                   No
                                                                   Y
      17
                                   3498 Super Lane
                                                                                 NaN
      18
                                                N/a
                                                                 N/a
                                                                                  Yes
      19
                     910 Tatooine Road, Tatooine
                                                                                    N
                                                                 Yes
[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(" ")
[14]:
          CustomerID First Name
                                     Last_Name
                                                 Phone Number
                 1001
                            Frodo
      0
                                       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
                                                 304-762-2467
                              Ron
                                       Swanson
      6
                 1007
                             Jeff
                                        Winger
                                                           NaN
      7
                                                 876 | 678 | 3469
                 1008
                         Sherlock
                                        Holmes
      8
                 1009
                         Gandalf
                                           NaN
                                                           N/a
      9
                 1010
                            Peter
                                        Parker
                                                 123-545-5421
                                        Gamgee
      10
                 1011
                          Samwise
                                                           NaN
                 1012
                                                   7066950392
      11
                            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
                                         Scott
                                                 123/643/9775
                         Michael
      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
                                                                         {\tt 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
                                                           Y
                           3498 Super Lane
                                                                         NaN
18
                                                         N/a
                                                                         Yes
               910 Tatooine Road, Tatooine
19
                                                         Yes
                                                                           N
```

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

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]:		${\tt CustomerID}$	$First_Name$	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 93 West Main Street 1 No Yes

```
2
                               298 Drugs Driveway
                                                                   N
                                                                                 NaN
      3
          980 Paper Avenue, Pennsylvania, 18503
                                                                                   Y
                                                                 Yes
      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
                            612 Shire Lane, Shire
      10
                                                                                  No
                                                                 Yes
      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
                                                                   Y
      17
                                  3498 Super Lane
                                                                                 NaN
      18
                                               N/a
                                                                 N/a
                                                                                 Yes
      19
                     910 Tatooine Road, Tatooine
                                                                                   N
                                                                 Yes
     df ["Phone_Number"] = df ["Phone_Number"] . apply (lambda x: str(x))
[24]:
[37]: df["Phone_Number"]=df["Phone_Number"].apply(lambda x: x[0:3] +'' + x[3:7] +'-'_
       +x[7:11])
      df
[37]:
          CustomerID First_Name
                                               Phone_Number
                                    Last_Name
                                                123-545-5421
                 1001
                            Frodo
                                       Baggins
                 1002
                                                123-643-9775
      1
                             Abed
                                         Nadir
      2
                 1003
                           Walter
                                         White
                                                        nan--
      3
                           Dwight
                 1004
                                                123-543-2345
                                       Schrute
      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
                 1009
                         Gandalf
      8
                                           NaN
                                                         Na--
      9
                 1010
                            Peter
                                       Parker
                                                 123-545-5421
                 1011
      10
                         Samwise
                                        Gamgee
                                                        nan--
      11
                 1012
                                       Potter
                            Harry
                                                        nan--
      12
                 1013
                              Don
                                        Draper
                                                123-543-2345
      13
                 1014
                          Leslie
                                         Knope
                                                876-678-3469
                 1015
                                                304-762-2467
      14
                             Toby
                                   Flenderson
      15
                 1016
                              Ron
                                       Weasley
                                                123-545-5421
                                                123-643-9775
      16
                 1017
                        Michael
                                         Scott
                            Clark
      17
                 1018
                                          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
                                                                                   No
                                                                 Yes
      1
                              93 West Main Street
                                                                  No
                                                                                  Yes
      2
                               298 Drugs Driveway
                                                                   N
                                                                                  NaN
      3
          980 Paper Avenue, Pennsylvania, 18503
                                                                                    Y
                                                                 Yes
      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
                                                                                  NaN
                                                                 Yes
                       25th Main Street, New York
      9
                                                                 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
                                                                   Y
                                   3498 Super Lane
                                                                                  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
                 1002
                             Abed
                                         Nadir
                                                 123-643-9775
      1
      2
                 1003
                           Walter
                                         White
      3
                 1004
                           Dwight
                                       Schrute
                                                 123-543-2345
      4
                 1005
                                                 876-678-3469
                              Jon
                                          Snow
      5
                                                 304-762-2467
                 1006
                              Ron
                                       Swanson
      6
                 1007
                             Jeff
                                        Winger
      7
                                        Holmes
                                                 876-678-3469
                 1008
                         Sherlock
      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
                                                 876-678-3469
                                         Knope
      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
                 1019
                            Creed
      18
                                        Braton
      19
                 1020
                                     Skywalker
                           Anakin
                                                 876-678-3469
```

Address Paying Customer Do_Not_Contact 0 123 Shire Lane, Shire 1 93 West Main Street No Yes 2 298 Drugs Driveway NaNN 3 980 Paper Avenue, Pennsylvania, 18503 Y Yes 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 NaN12 2039 Main Street N Yes 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 NaN18 N/a N/a Yes 19 910 Tatooine Road, Tatooine N Yes

[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]:	${\tt CustomerID}$	$First_Name$	${\tt Last_Name}$	Phone_Number	١
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 16 17 18 19	1016 Ron 1017 Michael 1018 Clark 1019 Creed 1020 Anakin	Scott Kent Braton	123-545-5 123-643-9 876-678-3	775		
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	93 W 298 980 Paper Avenue, Penn 1 7 12 1 25th Main S 612 Sh 2394 2 3 2395 121 Paper Avenue	ire Lane, Shi est Main Stre Drugs Drivev sylvania, 185 23 Dragons Ro 68 City Parkv 09 South Stre 98 Clue Dri 23 Middle Ear treet, New Yo ire Lane, Shi Hogwarts Aver 039 Main Stre 43 City Parkv 214 HR Aver Hogwarts Aver e, Pennsylvar 3498 Super La	eet yay 503 bad yay eet Lve orth brk tre nue eet yay nue nue nia nne	Customer Do_No Yes No N Yes Yes No N Yes	ot_Contact No Yes NaN Y No Yes No No NaN No No NaN No No NaN No No NaN No	
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	Street Address 123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway 214 HR Avenue 2395 Hogwarts Avenue 121 Paper Avenue 3498 Super Lane	State Shire None None Pennsylvania None None None None None None None None	None None None None None None None None	123 Middle 25th Main 612 Shin 2394 Hogwarts 2039 Main 343 City F	re Lane Street riveway Avenue ns Road Parkway Street e Drive e Earth Street re Lane Avenue Street Parkway Avenue Avenue Avenue	

```
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
                 1001
                            Frodo
                                                123-545-5421
      0
                                      Baggins
      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
                                                304-762-2467
                              Ron
                                      Swanson
      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
                                       Potter
                            Harry
      12
                 1013
                              Don
                                       Draper
                                                123-543-2345
                                        Knope
      13
                 1014
                          Leslie
                                                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
                                                                  γ
                                                                                  Nο
      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
                                                                  Y
      16
                  121 Paper Avenue, Pennsylvania
                                                                                  No
```

```
17
                                  3498 Super Lane
                                                                   Y
                                                                                 NaN
      18
                                               N/a
                                                                                 Yes
                                                                 N/a
      19
                     910 Tatooine Road, Tatooine
                                                                   Y
                                                                                   N
                 Street Address
                                           State
                                                                  Street_Address
                                                      Zip
      0
                 123 Shire Lane
                                           Shire
                                                     None
                                                                  123 Shire Lane
      1
           93 West Main Street
                                                     None
                                                            93 West Main Street
                                            None
      2
            298 Drugs Driveway
                                            None
                                                     None
                                                             298 Drugs Driveway
      3
               980 Paper Avenue
                                                                980 Paper Avenue
                                   Pennsylvania
                                                    18503
      4
               123 Dragons Road
                                                                123 Dragons Road
                                            None
                                                     None
      5
               768 City Parkway
                                                     None
                                                                768 City Parkway
                                            None
      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
                                                           2394 Hogwarts Avenue
                                            None
      12
               2039 Main Street
                                                                2039 Main Street
                                            None
                                                     None
      13
               343 City Parkway
                                            None
                                                     None
                                                                343 City Parkway
      14
                  214 HR Avenue
                                                     None
                                                                   214 HR Avenue
                                            None
      15
          2395 Hogwarts Avenue
                                            None
                                                     None
                                                           2395 Hogwarts Avenue
                                   Pennsylvania
               121 Paper Avenue
                                                                121 Paper Avenue
      16
                                                     None
      17
                3498 Super Lane
                                                     None
                                                                 3498 Super Lane
                                            None
                                                     None
      18
                             N/a
                                            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')
[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
                                      Swanson
                                                304-762-2467
                              Ron
      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
                 1016
                                      Weasley
                                                123-545-5421
      15
                              Ron
```

16 17 18 19	1017 Michael 1018 Clark 1019 Creed 1020 Anakin	Scott Kent Braton Skywalker	123-643-9 876-678-3			
		Addre	ess Paying	Customer Do_Not_	_Contact	\
0	123 Sh	ire Lane, Shi		Y	N	
1		est Main Str		N	Y	
2	298	Drugs Drive	<i>i</i> ay	N	NaN	
3	980 Paper Avenue, Penn	_	•	Y	Y	
4	_	23 Dragons Ro		Y	N	
5	7	68 City Parky	<i>i</i> ay	Y	Y	
6		09 South Stre	•	N	N	
7		98 Clue Dri	ive	N	N	
8	1	23 Middle Ear	rth	Y	NaN	
9	25th Main S	treet, New Yo	ork	Y	N	
10	612 Sh	ire Lane, Shi	ire	Y	N	
11	2394	Hogwarts Aver	nue	Y	NaN	
12	2	039 Main Stre	eet	Y	N	
13	3	43 City Parky	<i>v</i> ay	Y	N	
14		214 HR Aver	nue	N	N	
15	2395	Hogwarts Aver	nue	N	N	
16	121 Paper Avenu	e, Pennsylvar	nia	Y	N	
17		3498 Super La	ane	Y	NaN	
18		1	V/a	N/a	Y	
19	910 Tatooine	Road, Tatoo	ine	Y	N	
	Street Address	State	o 7in	Stroot Add	drogg	
0	123 Shire Lane	Shire	-	Street_Add 123 Shire		
1	93 West Main Street	None		93 West Main St		
2	298 Drugs Driveway	None		298 Drugs Driv		
3	•	Pennsylvania		980 Paper Av	•	
4	123 Dragons Road	None		123 Dragons		
5	768 City Parkway	None		768 City Par		
6	1209 South Street	None		1209 South St	-	
7	98 Clue Drive	None		98 Clue I		
8	123 Middle Earth	None		123 Middle H		
9	25th Main Street	New York		25th Main St		
10	612 Shire Lane	Shire		612 Shire		
11	2394 Hogwarts Avenue	None		2394 Hogwarts Av		
12	2039 Main Street	None		2039 Main St		
13	343 City Parkway	None		343 City Par		
14	214 HR Avenue	None		214 HR A	-	
15	2395 Hogwarts Avenue	None		2395 Hogwarts Av		
16	121 Paper Avenue	Pennsylvania		121 Paper Av		
17	3498 Super Lane	None		3498 Super		
18	N/a	None		0100 Duper	N/a	
10	11/ a	140116	, wone		11/ 4	

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			
			Addr	ess Paying Cus	tomer	Do Not	Contact
0		123 Sh	ire Lane, Sh		Y		ľ
1			est Main Str		N		}
2		298	Drugs Drive	wav	N		Nal
3	980 Paper A		sylvania, 18	•	Y		}
4	r		23 Dragons R		Y		ľ
-		_					_

	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	<u>-</u>		Y

N

Y

\

```
Street Address
                                    State
                                              Zip
                                                          Street_Address
0
          123 Shire Lane
                                                          123 Shire Lane
                                    Shire
                                             None
1
     93 West Main Street
                                     None
                                             None
                                                     93 West Main Street
2
      298 Drugs Driveway
                                                      298 Drugs Driveway
                                     None
                                             None
3
        980 Paper Avenue
                                            18503
                                                        980 Paper Avenue
                            Pennsylvania
4
        123 Dragons Road
                                                        123 Dragons Road
                                     None
                                             None
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
                                     None
11
    2394 Hogwarts Avenue
                                             None
                                                    2394 Hogwarts Avenue
                                                        2039 Main Street
12
        2039 Main Street
                                     None
                                             None
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
                                                         3498 Super Lane
                                     None
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	${\tt Gamgee}$	
	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	

		Address	Paying	Customer Do_Not	_Contact `
0	123 Sh	nire Lane, Shire		Y	N
1	93 V	West Main Street		N	Y
2	298	B Drugs Driveway		N	
3	980 Paper Avenue, Penr	nsylvania, 18503		Y	Y
4	1	123 Dragons Road		Y	N
5	7	768 City Parkway		Y	Y
6	12	209 South Street		N	N
7		98 Clue Drive		N	N
8	1	123 Middle Earth		Y	
9	25th Main S	Street, New York		Y	N
10	612 Sh	nire Lane, Shire		Y	N
11	2394	Hogwarts Avenue		Y	
12	2	2039 Main Street		Y	N
13	3	343 City Parkway		Y	N
14		214 HR Avenue		N	N
15	2395	Hogwarts Avenue		N	N
16	121 Paper Avenu	ıe, Pennsylvania		Y	N
17		3498 Super Lane		Y	
18					Y
19	910 Tatooine	e Road, Tatooine		Y	N
	g	a		g	_
•	Street Address	State	Zip	Street_Add	
0	123 Shire Lane	State Shire	Zip	123 Shire	Lane
1	123 Shire Lane 93 West Main Street		Zip	123 Shire 93 West Main St	Lane treet
1 2	123 Shire Lane 93 West Main Street 298 Drugs Driveway	Shire	-	123 Shire 93 West Main St 298 Drugs Driv	Lane treet veway
1 2 3	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue		Zip 18503	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av	Lane treet veway venue
1 2 3 4	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road	Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons	Lane treet veway venue Road
1 2 3 4 5	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway	Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pa	Lane treet veway venue Road rkway
1 2 3 4 5 6	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street	Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Par 1209 South St	Lane treet veway venue Road rkway treet
1 2 3 4 5 6 7	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive	Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St	Lane treet veway venue Road rkway treet
1 2 3 4 5 6 7 8	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth	Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St 98 Clue I 123 Middle I	Lane treet veway venue Road rkway treet Drive Earth
1 2 3 4 5 6 7 8	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street	Shire Pennsylvania New York	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Par 1209 South St 98 Clue I 123 Middle I 25th Main St	Lane treet veway venue Road rkway treet Drive Earth treet
1 2 3 4 5 6 7 8 9 10	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane	Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire	Lane treet veway venue Road rkway treet Drive Earth treet Lane
1 2 3 4 5 6 7 8 9 10	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue	Shire Pennsylvania New York	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue
1 2 3 4 5 6 7 8 9 10 11 12	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street	Shire Pennsylvania New York	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet
1 2 3 4 5 6 7 8 9 10 11 12 13	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway	Shire Pennsylvania New York	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St 343 City Pax	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet rkway
1 2 3 4 5 6 7 8 9 10 11 12 13 14	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway 214 HR Avenue	Shire Pennsylvania New York	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pax 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St 343 City Pax 214 HR Av	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet rkway venue
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway 214 HR Avenue	Shire Pennsylvania New York Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pat 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St 343 City Pat 214 HR Av 2395 Hogwarts Av	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet rkway venue venue
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway 214 HR Avenue 2395 Hogwarts Avenue	Shire Pennsylvania New York	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Par 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St 343 City Par 214 HR Av 2395 Hogwarts Av 121 Paper Av	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet rkway venue venue venue
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway 214 HR Avenue	Shire Pennsylvania New York Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Pat 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St 343 City Pat 214 HR Av 2395 Hogwarts Av	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet rkway venue venue venue
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	123 Shire Lane 93 West Main Street 298 Drugs Driveway 980 Paper Avenue 123 Dragons Road 768 City Parkway 1209 South Street 98 Clue Drive 123 Middle Earth 25th Main Street 612 Shire Lane 2394 Hogwarts Avenue 2039 Main Street 343 City Parkway 214 HR Avenue 2395 Hogwarts Avenue	Shire Pennsylvania New York Shire	-	123 Shire 93 West Main St 298 Drugs Driv 980 Paper Av 123 Dragons 768 City Par 1209 South St 98 Clue I 123 Middle I 25th Main St 612 Shire 2394 Hogwarts Av 2039 Main St 343 City Par 214 HR Av 2395 Hogwarts Av 121 Paper Av	Lane treet veway venue Road rkway treet Drive Earth treet Lane venue treet rkway venue venue venue Lane

```
[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
                                       Holmes
                 1008
                        Sherlock
                                                876-678-3469
                         Gandalf
      8
                 1009
                           Peter
      9
                 1010
                                       Parker
                                                123-545-5421
      10
                 1011
                         Samwise
                                       Gamgee
                 1012
                                       Potter
      11
                           Harry
      12
                 1013
                             Don
                                       Draper
                                                123-543-2345
      13
                 1014
                          Leslie
                                        Knope
                                                876-678-3469
      14
                                   Flenderson
                 1015
                            Toby
                                                304-762-2467
      15
                 1016
                             Ron
                                      Weaslev
                                                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
                                                          Y
      4
                         123 Dragons Road
                                                                          N
                        1209 South Street
      6
                                                          N
                                                                          N
      7
                            98 Clue Drive
                                                          N
                                                                          N
      8
                         123 Middle Earth
                                                          Υ
              25th Main Street, New York
      9
                                                          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
                                                          Y
      16
          121 Paper Avenue, Pennsylvania
                                                                          N
      17
                          3498 Super Lane
                                                          Y
      19
             910 Tatooine Road, Tatooine
                                                          Y
                                                                          N
                 Street Address
                                                             Street_Address
                                          State Zip
                 123 Shire Lane
                                                             123 Shire Lane
      0
                                          Shire
      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
          2394 Hogwarts Avenue
                                                      2394 Hogwarts Avenue
      11
      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
                                                          121 Paper Avenue
                                   Pennsylvania
      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
                 1001
                           Frodo
                                      Baggins
                                               123-545-5421
      0
      4
                 1005
                                         Snow 876-678-3469
                             Jon
      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
                 1020
      19
                          Anakin
                                    Skywalker
                                               876-678-3469
                                   Address Paying Customer Do_Not_Contact
      0
                    123 Shire Lane, Shire
                                                          Y
                                                                          N
                                                          Y
      4
                         123 Dragons Road
                                                                          N
      7
                            98 Clue Drive
                                                          N
                                                                          N
      9
              25th Main Street, New York
                                                          Y
                                                                          N
                         2039 Main Street
                                                          Y
      12
                                                                          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
                  98 Clue Drive
      7
                                                             98 Clue Drive
```

```
9
              25th Main Street
                                       New York
                                                           25th Main Street
              2039 Main Street
      12
                                                           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
                1005
      1
                             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
                                       Knope
                1014
                         Leslie
                                               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
         121 Paper Avenue, Pennsylvania
                                                         Y
      8
                                                                          N
      9
            910 Tatooine Road, Tatooine
                                                         Υ
                                                                          N
                Street Address
                                         State Zip
                                                            Street Address
      0
                123 Shire Lane
                                         Shire
                                                            123 Shire Lane
             123 Dragons Road
                                                          123 Dragons Road
      1
      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
            910 Tatooine Road
                                                         910 Tatooine Road
                                      Tatooine
```

[]: