Get all the streets (names) in South Boston

In [ ]:
```
import urllib.request
import json

url = "https://data.boston.gov/api/3/action/datastore_search?resource_id=a07cc1c6-aa78-4eb3-a005-dcf7a949249f&limit=18992"
response = urllib.request.urlopen(url).read().decode("utf-8")
r = json.loads(response)
r = (r['result']['records'])
south_boston_streets = set()
for record in r:
    if str(record['NBHD_R']) == "South Boston":
        if record['ST_NAME'] != None and record['ST_TYPE'] != None:
            south_boston_streets.add(record['ST_NAME'] + ' ' + record['ST_TYPE'])
        elif record['ST_TYPE'] == None:
            south_boston_streets.add(record['ST_NAME'])
```

Scrape Assessors for all South Boston streets to get the exact address of buildings on those streets and stroing the results in a csv file

In [ ]:
```
import selenium
import pandas as pd
from selenium import webdriver

def scrapeAssessors(address_list):

        print("Scraping Boston gov for details of properties")
        #driver = webdriver.Chrome("/usr/bin/chromedriver")
        #driver.get("https://www.cityofboston.gov/assessing/search/")

        results = []

        for address in address_list:

            if address != None:
                driver = webdriver.Chrome("/usr/bin/chromedriver")
                driver.get("https://www.cityofboston.gov/assessing/search/")

                search_field = driver.find_element_by_xpath("//input[@type='search']")
                search_field.send_keys(address)

                submit = driver.find_element_by_xpath("//input[@type='submit']")
                submit.click()

                if len(driver.find_elements_by_tag_name("table")) >= 4:
                    table = driver.find_elements_by_tag_name("table")[3]
                    rows = table.find_elements_by_tag_name("tr")

                    for row in rows:

                        columns = (row.find_elements_by_tag_name("td"))
                        data = {}
                        data_keys = ["PARCEL ID", "ADDRESS", "OWNER", "VALUE"]
                        for i in range (0, len(columns) -2):
                            data[data_keys[i]] = columns[i].text
                            if len(data.keys()) > 0:
                                results.append(data)
                driver.close()

        return results
```

```
##############################################################################


south_boston_buildings = scrapeAssessors(list(south_boston_streets))


dataDict = {}
rowIndex = 1
for result in south_boston_buildings:
    row = [result["PARCEL ID"],result["ADDRESS"],result["OWNER"],result["VALUE"]]
    dataDict[rowIndex] = row
    rowIndex += 1

south_boston_buildings_df = pd.DataFrame.from_dict(dataDict, orient='index', columns=["PARCEL ID",
 "ADDRESS", "OWNER", "VALUE"])
south_boston_buildings_df.to_csv('south-boston-buildings-info.csv', encoding='utf-8', index=False)
```

Find all the properties owned by people in voter file by scrape Assessors for all the names in voter file and store the result in csv file

the reason we do this is because people on voter file are the only ones whose contact information we have

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

voter_df = pd.read_excel('Voter File_Polish Triangle.xls', header=0)

voter_names = []
for index, row in voter_df.iterrows():
        voter_names.append(row['Last Name'] + " " + row['First Name'])

property_per_voter = scrapeAssessors(list(voter_names))

dataDict = {}
rowIndex = 1

for result in property_per_voter:
    row = [result["PARCEL ID"],result["ADDRESS"],result["OWNER"],result["VALUE"]]
    dataDict[rowIndex] = row
    rowIndex += 1

property_per_voter_df = pd.DataFrame.from_dict(dataDict, orient='index', columns=["PARCEL ID", "AD
DRESS", "OWNER", "VALUE"])
property_per_voter_df.to_csv('property_per_voter.csv', encoding='utf-8', index=False)
```

Find latitude and longitude all addresses found in South Boston using googlemaps geocode api

we need latitude and longitude since we want to show the results in a map

In [ ]:
```
import googlemaps

south_boston_buidings_df = pd.read_csv('south-boston-buildings-info.csv', header=0)
south_boston_buidings_df = south_boston_buidings_df.drop_duplicates()

api_key = 'AIzaSyCGcx9z58SqBB8CualaptqGQcxzJDMM5lY'

def get_location(address):
    gm = googlemaps.Client(key = api_key)
    result = gm.geocode(address)
    if len(result) > 0:
        location = result[0]['geometry']['location']
    else:
        location= {}
        location['lat'] = 'nan'
        location['lng'] = 'nan'
    return location

def get_location_dict(addresses):
    addresses = list(set(addresses))
    data_dict = {}
    row_index = 0
    for address in addresses:
        location = get_location(address + ' Boston')
        row = [address, location['lat'], location['lng']]
        data_dict[row_index] = row
        row_index += 1
    return data_dict

addresses = south_boston_buidings_df['ADDRESS'].tolist()
data_dict = get_location_dict(addresses)
addr_lat_lng_df = pd.DataFrame.from_dict(data_dict, orient='index', columns=['ADDRESS','LATITUDE',
'LONGITUDE'])
addr_lat_lng_df.to_csv('addr_lat_lng.csv')

addresses = property_per_voter_df['ADDRESS'].tolist()
addresses = list(set(addresses))
data_dict = get_location_dict(addresses)
addr_lat_lng_df2 = pd.DataFrame.from_dict(data_dict, orient='index', columns=['ADDRESS','LATITUDE'
,'LONGITUDE'])
addr_lat_lng_df2.to_csv('addr_lat_lng2.csv')
```

Get all the buildings in south boston And merging latitude and longitude values

In [2]:
```
import pandas as pd

south_boston_buildings_df = pd.read_csv('south-boston-buildings-info.csv', header=0)
south_boston_buildings_df = south_boston_buildings_df.drop_duplicates()
addr_lat_lng_df = pd.read_csv('addr_lat_lng.csv', header=0, index_col=0)
addr_lat_lng_df
south_boston_buildings_df = south_boston_buildings_df.merge(addr_lat_lng_df, on='ADDRESS')
south_boston_buildings_df = south_boston_buildings_df.dropna()
south_boston_buildings_df
```

Out[2]:

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE
0	702191000	SALERNO PL	WHITE CLAIRE L IF	$24,600	42.332552	-71.039370
1	702193000	SALERNO PL	KEENAN FRED	$9,600	42.332552	-71.039370
2	702194000	SALERNO PL	KEENAN FRED	$9,600	42.332552	-71.039370
3	702195000	SALERNO PL	ALA SALERNO PLACE	$24,300	42.332552	-71.039370
4	702197000	SALERNO PL	ALA SALERNO PLACE	$24,400	42.332552	-71.039370
5	702198000	SALERNO PL	ALA SALERNO PLACE	$24,400	42.332552	-71.039370
6	702192000	5 SALERNO PL	SULLIVAN CLIFTON G	$24,600	40.682441	14.768096
7	702196000	6 SALERNO PL	ALA SALERNO PLACE	$24,400	42.332552	-71.039370
8	601607000	E ST	LANCIONE STEPHEN A	$38,300	42.339151	-71.047722
9	602836010	E ST	MASSACHUSETTS CONVENTION	$4,798,400	42.339151	-71.047722
10	602838040	E ST	MASSACHUSETTS PORT AUTHORITY	$662,300	42.339151	-71.047722
11	700353020	156 E ST	BYRNE PATRICK	$518,100	42.333892	-71.054274
12	700354010	159 E ST	PICKUP MICHAEL G	$785,500	42.333751	-71.053964
13	700353010	160 E ST	BYRNE EDWARD F JR	$748,700	42.333932	-71.054199
14	700352000	162 E ST	ONE62 E STREET CONDO TR	$0	42.333979	-71.054153
15	700352002	162 E ST Apt. 1	DWYER CARA	$378,700	42.333981	-71.054158
16	700352004	162 E ST Apt. 2	SARKIS MANUEL G	$317,800	42.333981	-71.054158
17	700352006	162 E ST Apt. 3	HENNESSY CAITLIN	$359,100	42.333981	-71.054158
18	700356000	163 E ST	AUSTIN MARIANNE T	$579,100	42.333881	-71.053786
19	700351000	164 E ST	BRIZZOLARA ZOE E	$475,200	42.334023	-71.054083
20	700350000	168 E ST	BYRNE MARILYN	$377,200	42.334086	-71.054013
21	700524000	177 E ST	DAVIS WILLIAM J TS	$904,900	42.334113	-71.053468
22	700525000	181 E ST	DAVIS WILLIAM J TS	$9,900	42.334147	-71.053444
23	700298000	182 E ST	STECKLOFF JONATHAN R	$580,100	42.334352	-71.053561
24	700526000	183 E ST	MULDOWNEY JOHN E ETAL	$9,900	42.334184	-71.053386
25	700297000	184 E ST	BYRNE JOHN JOSEPH	$463,300	42.334378	-71.053557

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE
26	700527000	185 E ST	MULDOWNEY JOHN E ETAL	$523,400	42.334217	-71.053305
27	700528000	187 E ST	187 E STREET LLC	$328,000	42.334320	-71.053208
28	600796020	194 E ST Apt. 194-1	ONE-94 E REALTY LLC	$465,600	42.334697	-71.053189
29	600796022	194 E ST Apt. 194-2	CARPENTER JESSICA L	$451,900	42.334697	-71.053189
...	...	...	...	...	...	...
12784	700545014	275 OLD COLONY AV Apt. 7	MCNAMARA DANIEL	$651,900	42.330609	-71.053021
12785	700545016	275 OLD COLONY AV Apt. 8	ROBERTS ALISTAIR J	$652,900	42.330609	-71.053021
12786	700545018	275 OLD COLONY AV Apt. 9	CABOT RESIDENTIAL INC	$598,300	42.330609	-71.053021
12787	700545030	275 OLD COLONY AV Apt. COMM-A	CABOT RESIDENTIAL INC	$109,000	42.330641	-71.053143
12788	700545032	275 OLD COLONY AV Apt. COMM-B	CABOT RESIDENTIAL INC	$164,500	42.330641	-71.053143
12789	700545042	275 OLD COLONY AV Apt. PS-10	BEDNARZ MICHAEL	$40,000	42.330641	-71.053143
12790	700545043	275 OLD COLONY AV Apt. PS-11	NIGRIN DANIEL	$40,000	42.330641	-71.053143
12791	700545044	275 OLD COLONY AV Apt. PS-12	FERRETTI KRISTA E	$40,000	42.330641	-71.053143
12792	700545045	275 OLD COLONY AV Apt. PS-13	KOLLER MARCUS K	$40,000	42.330641	-71.053143
12793	700545046	275 OLD COLONY AV Apt. PS-14	KOLLER MARCUS K	$40,000	42.330641	-71.053143
12794	700545034	275 OLD COLONY AV Apt. PS-2	MCNAMARA DANIEL	$40,000	42.330641	-71.053143
12795	700545035	275 OLD COLONY AV Apt. PS-3	ROBERTS ALISTAIR J	$40,000	42.330641	-71.053143
12796	700545036	275 OLD COLONY AV Apt. PS-4	RICHARD A BARRY REVOCABLE	$40,000	42.330641	-71.053143
12797	700545037	275 OLD COLONY AV Apt. PS-5	BEDNARZ ALANA	$40,000	42.330641	-71.053143
12798	700545038	275 OLD COLONY AV Apt. PS-6	VELOZO GUSTAVO ZACALESKI	$40,000	42.330641	-71.053143
12799	700545039	275 OLD COLONY AV Apt. PS-7	WILLIAMS PURRIS	$40,000	42.330641	-71.053143
12800	700545040	275 OLD COLONY AV Apt. PS-8	CARR LORRIE	$40,000	42.330641	-71.053143
12801	700545041	275 OLD COLONY AV Apt. PS-9	CABOT RESIDENTIAL INC	$40,000	42.330641	-71.053143
12802	700546000	283 OLD COLONY AV	283 OLD COLONY LLC	$153,500	42.330345	-71.052876
12803	700549000	287 OLD COLONY AV	VU REALTY LLC	$762,500	42.330155	-71.052853
12804	700599000	295 OLD COLONY AV	TWO 95 OLD COLONY REALTY LLC	$573,500	42.329941	-71.052957
12805	700567010	309 OLD COLONY AV	309 OLD COLONY RLTY TR LLC	$1,349,000	42.329629	-71.052980

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE
12806	700772000	333 OLD COLONY AV	ROMAN CATH ARCH OF BOS	$2,865,100	42.328990	-71.053098
12807	700773000	345 OLD COLONY AV	BOSTON HOUSING AUTHORITY	$29,676,500	42.328743	-71.052940
12808	702847000	391 OLD COLONY AV	BOSTON HOUSING AUTHORITY	$26,208,000	42.326809	-71.052520
12809	702855000	505 OLD COLONY AV	COMM OF MASS MBTA	$946,200	42.323507	-71.052795
12810	600325000	54 OLD COLONY AV	COLE DEVELOPMENT LLC	$2,574,000	42.336634	-71.055836
12811	600314000	6 OLD COLONY AV	COLE DEVELOPMENT LLC	$792,840	42.337836	-71.056658
12812	600368000	60 OLD COLONY AV	COLE DEVELOPMENT LLC	$2,767,165	42.336177	-71.055575
12813	700276005	75 OLD COLONY AV	GALATIS WILLIAM P TS	$564,500	42.335730	-71.055975

12806 rows × 6 columns

Get all the buildings owned by people in voter file and And merging latitude and longitude values

In [3]:
```
import json

data_dict = {}
row_index = 0
content = None

with open('Property-Per-Voter.json') as f:
    for line in f:
        content = json.loads(line)

for data in content:
    data_dict[row_index] = [data['PARCEL ID'], data['ADDRESS'], data['OWNER'], data['VALUE']]
    row_index += 1

property_per_voter_df = pd.DataFrame.from_dict(data_dict, orient='index', columns=['PARCEL ID', 'A
DDRESS','OWNER','VALUE'])
property_per_voter_df = property_per_voter_df.drop_duplicates()
property_per_voter_df

addr_lat_lng_df2 = pd.read_csv('addr_lat_lng2.csv', header=0, index_col=0)
#addr_lat_lng_df2
property_per_voter_df = property_per_voter_df.merge(addr_lat_lng_df2, on='ADDRESS')
property_per_voter_df
```

Out[3]:

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE
0	0502442380	145 PINCKNEY ST Apt. 630	HIGGINS SEAN R	$480,600	42.359098	-71.071592
1	0502442382	145 PINCKNEY ST Apt. 632	HIGGINS SEAN R	$541,700	42.359098	-71.071592
2	0703064000	12 ST MARGARET ST	DELLACHIESA JOYCE S	$479,200	42.322310	-71.060246
3	0703072002	84 ROSECLAIR ST Apt. 1	FITZGERALD SEAN M	$409,100	42.321385	-71.057529
4	0703072004	84 ROSECLAIR ST Apt. 2	HORNSBY MITCHELL R	$409,100	42.321385	-71.057529
5	0703072006	84 ROSECLAIR ST Apt. 3	AUCLAIR RICHARD J	$409,100	42.321385	-71.057529
6	0702991010	16 ROSECLAIR ST	CALABRESE JOHN	$529,800	42.321030	-71.060584
7	0101305000	1128 SARATOGA ST	RUSSO JOHN M	$524,600	42.384807	-71.001001
8	0106474000	275R HAVRE ST	RUSSO JOHN	$27,200	42.375972	-71.034203
9	0106475000	275 HAVRE ST	RUSSO JOHN	$372,000	42.376070	-71.034277
10	1904155000	88 SYCAMORE ST	LORUSSO JOHN	$431,200	42.284289	-71.125530
11	2008892000	27 TEMPLE ST	DELLORUSSO JOHN T	$605,800	42.360442	-71.063728
12	2201146000	76 BRENTWOOD ST	COLARUSSO JOHN	$822,700	42.360447	-71.133190
13	2201176000	15 RAYMOND ST	COLARUSSO JOHN	$922,800	42.361410	-71.134825
14	1810356000	6 LORING ST	MORALES MARJORIE K	$347,500	42.334475	-71.051622
15	0703125002	48 HARVEST ST Apt. 1	CASSIDY THERESA	$360,000	42.323062	-71.058993
16	0703125004	48 HARVEST ST Apt. 2	KINDELAN MEGHAN	$490,200	42.323002	-71.059003
17	0703264016	8 HOWELL ST Apt. 3	GIUSTINO ROCCO	$514,000	42.324741	-71.057079
18	0703264012	8 HOWELL ST Apt. 1	LAWLER PATRICK	$601,500	42.324741	-71.057079
19	0703264020	8 HOWELL ST Apt. 5	VIEDMA GEORGE A	$547,500	42.324741	-71.057079
20	0703264020	8 HOWELL ST Apt. 5	SARAF JAMES P	$547,500	42.324741	-71.057079
21	0703264022	8 HOWELL ST Apt. 6	STEWART TRAVIS	$541,200	42.324741	-71.057079
22	0703264014	8 HOWELL ST Apt. 2	WEIL TODD	$609,700	42.324741	-71.057079
23	0201114000	30 AUBURN ST	MCLAUGHLIN JANET TS	$804,700	42.381239	-71.069253
24	0703145000	11 HARVEST ST	BASSILL LESTER JR	$609,800	42.322776	-71.057321
25	0703145000	11 HARVEST ST	BASSILL HELEN	$609,800	42.322776	-71.057321

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE
26	0703147006	15 HARVEST ST Apt. 3	PHILLIPS TAYLOR	$397,300	42.322900	-71.057528
27	0703147006	15 HARVEST ST Apt. 3	LOMOND LEAH	$397,300	42.322900	-71.057528
28	0703147002	15 HARVEST ST Apt. 1	LEGER NICHOLAS J	$428,300	42.322900	-71.057528
29	0400309002	144 WARREN AV Apt. 1	SHERMAN JOHN W	$1,661,100	42.343907	-71.074871
...	...	...	...	...	...	...
1436	0502668006	277 BEACON ST Apt. 1-B	CAREY KENNETH D	$671,100	42.353094	-71.080121
1437	0703331020	24 RAWSON ST Apt. PS-16	CAREY KENNETH	$29,400	42.326010	-71.057959
1438	0703331020	24 RAWSON ST Apt. PS-16	URBAN KERRIE A	$29,400	42.326010	-71.057959
1439	1901852004	100 POND ST Apt. 2	MCCAREY KENNETH	$709,300	42.313689	-71.118616
1440	0703316008	27 WASHBURN ST Apt. 4	URBAN KERRIE A	$591,200	42.325824	-71.057918
1441	0703316008	27 WASHBURN ST Apt. 4	BLAKESLEY-BALL RICHARD	$591,200	42.325824	-71.057918
1442	0703316004	27 WASHBURN ST Apt. 2	SATO STEPHANIE	$588,400	42.325824	-71.057918
1443	0703316010	27 WASHBURN ST Apt. 5	WHISLER MEAGHAN B	$590,700	42.325824	-71.057918
1444	0500764000	48 MELROSE ST	DONALD SIMONINI TS	$0	42.348932	-71.068870
1445	0703458002	155 BOSTON ST Apt. 1	MUI MONICA G	$535,700	42.324469	-71.059902
1446	0702971022	246 BOSTON ST Apt. 6	RILEY BETHANY ANN	$588,300	42.321376	-71.061024
1447	0702971028	246 BOSTON ST Apt. 9	BOWKER MATTHEW C	$639,600	42.321376	-71.061024
1448	0702971028	246 BOSTON ST Apt. 9	BOWKER AMANDA B	$639,600	42.321376	-71.061024
1449	0702971026	246 BOSTON ST Apt. 8	FAULISO LENORE	$623,900	42.321376	-71.061024
1450	0702971018	246 BOSTON ST Apt. 4	BARRY BRENDEN E	$588,200	42.321376	-71.061024
1451	0702971024	246 BOSTON ST Apt. 7	FISHER SEAN	$588,300	42.321376	-71.061024
1452	0703238006	19 BELLFLOWER ST Apt. 3	RAYMOND PRESTON M	$523,800	42.324635	-71.058203
1453	0703238010	19 BELLFLOWER ST Apt. 5	DUBAS EMILY M	$546,500	42.324635	-71.058203
1454	2000775000	11 WESTBOURNE ST	GILL CHRISTINA	$692,400	42.281013	-71.142832
1455	0502861012	90 MARLBOROUGH ST Apt. 6	ONEIL JENNIFER E TRUSTEE	$3,748,800	42.353327	-71.076035
1456	0502861020	90 MARLBOROUGH ST Apt. PS-1	ONEIL JENNIFER E TRUSTEE	$49,500	42.353332	-71.076033
1457	0502861021	90 MARLBOROUGH ST Apt. PS-2	ONEIL JENNIFER E TRUSTEE	$49,500	42.353332	-71.076033

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE
1458	1700070000	13 ALGONQUIN ST	RUDD-ONEIL JENNIFER (PRES)	$33,200	42.298001	-71.073503
1459	2102211054	1746 COMMONWEALTH AV Apt. 12A	WU HAO	$383,600	42.341041	-71.149440
1460	0703244000	134 BOSTON ST	WU CRYSTAL P	$477,500	42.324826	-71.059106
1461	0703244000	134 BOSTON ST	WU GRACE Y	$477,500	42.324826	-71.059106
1462	2101539044	59 BRAINERD RD Apt. 402	WU TIFFANY HAL YAN	$357,500	42.348048	-71.132825
1463	0702953016	17 ROSECLAIR ST Apt. 3	CHAUDHARY FARRAH K	$587,200	42.320784	-71.060736
1464	0702953012	17 ROSECLAIR ST Apt. 1	TOKARSKI JUSTIN	$449,500	42.320784	-71.060736
1465	0702953018	17 ROSECLAIR ST Apt. 4	DEGRUTTOLA MATTHEW J	$632,100	42.320784	-71.060736

1466 rows × 6 columns

Find the properties that are not on the market by mergin the data we have by the data obtained from zillow search

based on the results below non of the building we have found are on the maket

In [4]:
```
zillow_df = pd.read_csv('zillow.csv', header=0)
zillow_df = zillow_df.drop_duplicates()
on_market = south_boston_buildings_df.merge(zillow_df, how='inner', left_on=['ADDRESS','LATITUDE',
 'LONGITUDE'], right_on=['address','latitude','longitude'])
on_market2 = property_per_voter_df.merge(zillow_df, how='inner', left_on=['ADDRESS','LATITUDE', 'L
ONGITUDE'], right_on=['address','latitude','longitude'])
#on_market
#zillow_df
#on_market2
```

Merge property per owner and south boston buildings.

This is gonna be an outter merge by doing so we include only properties in property per owners that are in South Boston. for this subset of data we have the contact information of owners.

In [5]:
```
south_boston_buildings_df['PARCEL ID'] = south_boston_buildings_df['PARCEL ID'].astype(str)
property_per_voter_df['PARCEL ID'] = property_per_voter_df['PARCEL ID'].astype(str)
property_per_voter_sb = property_per_voter_df.merge(south_boston_buildings_df, how='inner', on=['A
DDRESS','LATITUDE', 'LONGITUDE'])
property_per_voter_sb = property_per_voter_sb.rename(index=str, columns={"PARCEL ID_x": "PARCEL I
D", "OWNER_x": "OWNER", "VALUE_x": "VALUE"})
property_per_voter_sb = property_per_voter_sb.drop(['PARCEL ID_y', 'OWNER_y', 'VALUE_y'], axis=1)
property_per_voter_sb
voter_df = pd.read_excel('Voter File_Polish Triangle.xls', header=0)
voter_df['Phone .'] = voter_df['Phone .'].astype(str)
voter_df['DOB'] = voter_df['DOB'].astype(str)

voter_dict = {}
for index, row in voter_df.iterrows():
    key = row['Last Name'] + ' ' + row['First Name']
    value = {'DOB': row['DOB'], 'OCCUPATION': row['Occupation'], 'PHONE': row['Phone .']}
    if key in voter_dict:
        voter_dict[key].append(value)
    else:
        voter_dict[key] = [value]
#print(voter_dict['SMITH EDWARD'])
'''for key in voter_dict:
    if len(voter_dict[key]) > 1:
        print(key)
        print(voter_dict[key])'''

data_dict = {}
idx = 1
for index, row in property_per_voter_sb.iterrows():
    key = row['OWNER']
    if key in voter_dict:
        row['DOB'] = '-'.join([value['DOB'] for value in voter_dict[key]])
        row['OCCUPATION'] = '-'.join([value['OCCUPATION'] for value in voter_dict[key]])
        row['PHONE'] = '-'.join([value['PHONE'] for value in voter_dict[key]])
    data_dict[idx] = row
    idx += 1

property_per_voter_sb_df  = pd.DataFrame.from_dict(data_dict, orient='index', columns=["PARCEL ID"
, "ADDRESS", "OWNER", "VALUE", "LATITUDE", "LONGITUDE","DOB","OCCUPATION","PHONE"])
property_per_voter_sb_df['PHONE'] = property_per_voter_sb_df['PHONE'].astype(str)
property_per_voter_sb_df['DOB'] = property_per_voter_sb_df['DOB'].astype(str)
property_per_voter_sb_df['OCCUPATION'] = property_per_voter_sb_df['OCCUPATION'].astype(str)
```

```
property_per_voter_sb_df.to_csv('property_per_voter_sb.csv', encoding='utf-8', index=False)

property_per_voter_sb_df
#voter_df
#property_per_voter_sb
#print(voter_dict)
```

Out[5]:

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE	DOB	OCCUPATION	PHONE
1	1810356000	6 LORING ST	MORALES MARJORIE K	$347,500	42.334475	-71.051622	nan	nan	nan
2	1810356000	6 LORING ST	MORALES MARJORIE K	$347,500	42.334475	-71.051622	nan	nan	nan
3	0602902018	117 DRESSER ST Apt. 4	BAKER RICHARD D	$1,123,700	42.337210	-71.044124	nan	nan	nan
4	0603113000	33 I ST	MCCARTHY KEVIN M	$680,600	42.336999	-71.040108	nan	nan	nan
5	0603114000	35 I ST	MCCARTHY KEVIN M	$831,000	42.336929	-71.040131	nan	nan	nan
6	0701100004	68 TELEGRAPH ST Apt. 68-2	BANDA ALISON KELLY	$427,800	42.333122	-71.047780	nan	nan	nan
7	0400167010	12 DARTMOUTH PL Apt. 12-2	SMITH EDWARD	$479,400	42.345082	-71.073652	1983-12-22	UNKNOWN	nan
8	0400167012	12 DARTMOUTH PL Apt. 12-3	SMITH EDWARD	$867,800	42.345082	-71.073652	1983-12-22	UNKNOWN	nan
9	0701271006	69 GATES ST Apt. 3	MORGAN SEAN	$461,100	42.331573	-71.048446	1991-03-11	UNKNOWN	nan
10	0701723002	33 STORY ST Apt. 1	MACDOUGALL ANDREW R	$595,100	42.333294	-71.042814	nan	nan	nan
11	0601904002	277 SILVER ST Apt. 1	CONTE ELIZABETH S	$355,800	42.336227	-71.047971	nan	nan	nan
12	0701554004	20 WINFIELD ST Apt. 2	MURPHY LAUREN ASHLEY	$623,700	42.331629	-71.042393	nan	nan	nan
13	0701793006	30 STORY ST Apt. 3	MURPHY LAUREN	$561,700	42.333497	-71.042938	1980-12-30	UNKNOWN	6178278964.0
14	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
15	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
16	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
17	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE	DOB	OCCUPATION	PHONE
18	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
19	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
20	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
21	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
22	0601281000	W SECOND ST	FLAHERTY JOHN TS	$0	42.340596	-71.049963	nan	nan	nan
23	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
24	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
25	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
26	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
27	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
28	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
29	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
30	0601253020	W SECOND ST	FITZGERALD THOMAS	$69,200	42.340596	-71.049963	1990-12-31	LABORER	6172658984.0
...	...	...	...	...	...	...	...	...	...
173	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
174	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
175	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
176	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE	DOB	OCCUPATION	PHONE
177	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
178	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
179	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
180	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
181	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
182	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
183	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
184	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
185	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
186	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
187	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
188	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
189	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
190	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
191	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
192	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan
193	0703229001	DORCHESTER AV	FISHER EDMUND	$6,100	42.307900	-71.058368	1937-10-08	RETIRED	nan

	PARCEL ID	ADDRESS	OWNER	VALUE	LATITUDE	LONGITUDE	DOB	OCCUPATION	PHONE
194	0703458002	155 BOSTON ST Apt. 1	MUI MONICA G	$535,700	42.324469	-71.059902	nan	nan	nan
195	0702971022	246 BOSTON ST Apt. 6	RILEY BETHANY ANN	$588,300	42.321376	-71.061024	nan	nan	nan
196	0702971028	246 BOSTON ST Apt. 9	BOWKER MATTHEW C	$639,600	42.321376	-71.061024	nan	nan	nan
197	0702971028	246 BOSTON ST Apt. 9	BOWKER AMANDA B	$639,600	42.321376	-71.061024	nan	nan	nan
198	0702971026	246 BOSTON ST Apt. 8	FAULISO LENORE	$623,900	42.321376	-71.061024	1973-01-26	UNKNOWN	nan
199	0702971018	246 BOSTON ST Apt. 4	BARRY BRENDEN E	$588,200	42.321376	-71.061024	nan	nan	nan
200	0702971024	246 BOSTON ST Apt. 7	FISHER SEAN	$588,300	42.321376	-71.061024	1984-08-02	UNKNOWN	nan
201	0703244000	134 BOSTON ST	WU CRYSTAL P	$477,500	42.324826	-71.059106	nan	nan	nan
202	0703244000	134 BOSTON ST	WU GRACE Y	$477,500	42.324826	-71.059106	nan	nan	nan

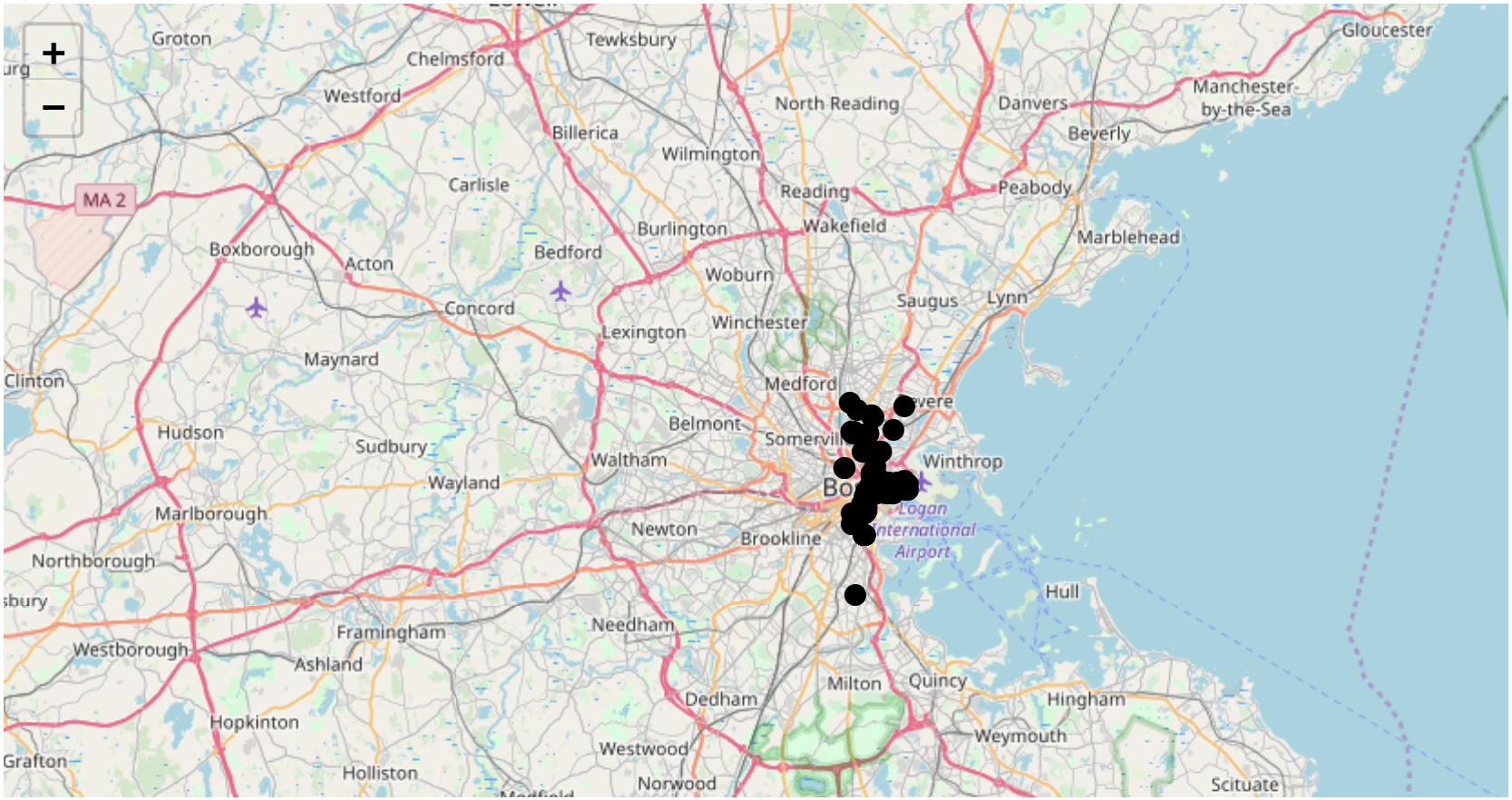
202 rows × 9 columns

show the properties whose owner existed on voter file it means we have some personal infomation about their owners

In [9]:
```
import folium


m = folium.Map(location=[42.33343, -71.04949])
for index, row in property_per_voter_sb_df .iterrows():
    folium.Marker([row['LATITUDE'], row['LONGITUDE']], popup='<i>' + "Owner: " + row['OWNER'] +
                                                             '<br>' + "Phone:" + row['PHONE'].spli
t('.')[0] +
                                                             '<br>' + "Occupation:" + row['OCCUPAT
ION'] +
                                                             '<br>' + "DOB:" + row['DOB'] +
                                                             '<br>' + "Value:" + row['VALUE'] +
                                                             '<br>' + "ParcelID:" + row['PARCEL I
D'] +
                                                             '</i>',
                                                             icon=folium.Icon(color='red' if row[
'PHONE'] != 'nan'
                                                            else 'green', prefix='fa', icon='circ
le'),
                                                             tooltip=row['ADDRESS']).add_to(m)


legend_html = '''
     <div style="position: fixed;
     bottom: 50px; left: 50px; width: 100px; height: 90px;
     border:2px solid grey; z-index:9999; font-size:14px;
     ">  Legend <br>
       red: with contact info   <i class="fa fa-map-marker fa-2x"
                  style="color:green"></i><br>
       green:without contatct info   <i class="fa fa-map-marker fa-2x"
                  style="color:red"></i>
      </div>
     '''

m.get_root().html.add_child(folium.Element(legend_html))
m.save('map.html')
m
```

Out[9]:

Legend
red: with contact info
green:without contatct info



In [ ]: