Final Project:

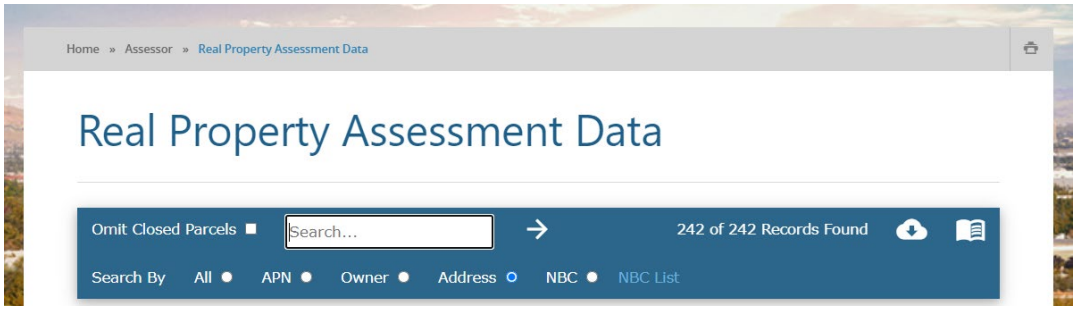
In this project, you will write a program to scrape the data from the Washoe County Real Property Assessment tool: https://www.washoecounty.gov/assessor/cama/. The difficulty with using this tool is that the content is generated dynamically, so we will use the Selenium library in python to scrape the data. You are required to use Selenium in python.

Your program must take one mandatory and one optional argument from the command line. Your program needs to deal with the issues around command line arguments (i.e. making sure that they are provided before trying to use them). The input arguments are:

- Mandatory argument: A single word search term
- Optional argument: An integer indicating the maximum number of results

If the `num_results` argument is provided on the command line, your program should scrape only the minimum of either the `num_results` or the number of actual results on the webpage.

Your program should press the address radio button (so that only addresses containing the `search_term` are matched) and then the `search_term` input argument must be sent to the search box of the webpage. Your program should then press the Enter key to perform the search. The website code sends the request once the input element is updated, but we will press the Enter key to ensure the query is sent.

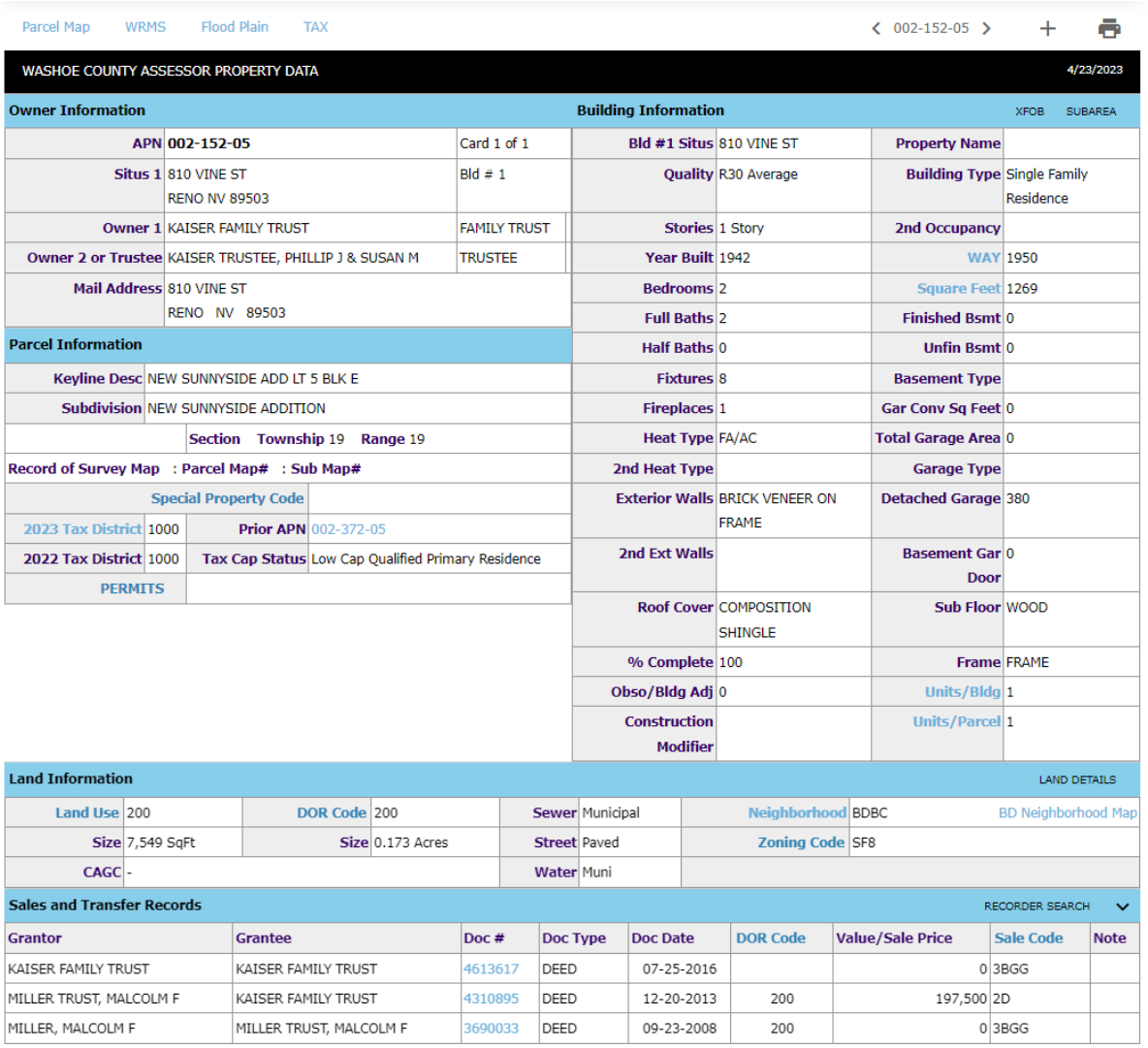


You will need to manage the delay of the network response with the expectation of your program for the response data to be available by inserting `sleep()` delays at various points in your program. Do not use excessive sleeps however, it should not take more than 10 minutes to download 30 records of the data for the search term “vine”.

Note: This is a public dataset, on a real server. Please do not send so many requests that the server thinks it is under attack. **Your program should not send requests any faster than once every 3 seconds.**

Once the results are populated, your program will need to inspect the results. You may try to implement a system of clicking on each result and then pressing back to go to the next record. However, I found it simpler to just get the list of APNs from the results page and then update the URL with the APN for each property and iterate over the list of APNs to get the detailed record for each property.

The detailed record page looks like:



Parcel Map WRMS Flood Plain TAX 002-152-05

WASHOE COUNTY ASSESSOR PROPERTY DATA 4/23/2023

Owner Information

APN	002-152-05	Card 1 of 1
Situs 1	810 VINE ST RENO NV 89503	Bld # 1
Owner 1	KAISER FAMILY TRUST	FAMILY TRUST
Owner 2 or Trustee	KAISER TRUSTEE, PHILLIP J & SUSAN M	TRUSTEE
Mail Address	810 VINE ST RENO NV 89503	

Parcel Information

Keyline Desc	NEW SUNNYSIDE ADD LT 5 BLK E		
Subdivision	NEW SUNNYSIDE ADDITION		
	Section Township 19 Range 19		
Record of Survey Map : Parcel Map# : Sub Map#			
Special Property Code			
2023 Tax District	1000	Prior APN	002-372-05
2022 Tax District	1000	Tax Cap Status	Low Cap Qualified Primary Residence
PERMITS			

Building Information XFOB SUBAREA

Bld #1 Situs	810 VINE ST	Property Name	
Quality	R30 Average	Building Type	Single Family Residence
Stories	1 Story	2nd Occupancy	
Year Built	1942	WAY	1950
Bedrooms	2	Square Feet	1269
Full Baths	2	Finished Bsmt	0
Half Baths	0	Unfin Bsmt	0
Fixtures	8	Basement Type	
Fireplaces	1	Gar Conv Sq Feet	0
Heat Type	FA/AC	Total Garage Area	0
2nd Heat Type		Garage Type	
Exterior Walls	BRICK VENEER ON FRAME	Detached Garage	380
2nd Ext Walls		Basement Gar Door	0
Roof Cover	COMPOSITION SHINGLE	Sub Floor	WOOD
% Complete	100	Frame	FRAME
Obso/Bldg Adj	0	Units/Bldg	1
Construction Modifier		Units/Parcel	1

Land Information LAND DETAILS

Land Use	200	DOR Code	200	Sewer	Municipal	Neighborhood	BDBC BD Neighborhood Map
Size	7,549 SqFt	Size	0.173 Acres	Street	Paved	Zoning Code	SF8
CAGC	-			Water	Muni		

Sales and Transfer Records RECORDER SEARCH

Grantor	Grantee	Doc #	Doc Type	Doc Date	DOR Code	Value/Sale Price	Sale Code	Note
KAISER FAMILY TRUST	KAISER FAMILY TRUST	4613617	DEED	07-25-2016		0	3BGG	
MILLER TRUST, MALCOLM F	KAISER FAMILY TRUST	4310895	DEED	12-20-2013	200	197,500	2D	
MILLER, MALCOLM F	MILLER TRUST, MALCOLM F	3690033	DEED	09-23-2008	200	0	3BGG	

You need to extract the following pieces of data:

- From the Owner Information box:
  - `Situs 1`
  - `Owner 1`
- From the Building Information box:
  - Every key/value pair where the value is not empty. For example, you would collect the `Unfin Bsmt` because the value is zero, but you would not collect the `Basement Type` because the value is blank.
- From the Land Information box:
  - `Size` (Acres, not SqFt)
  - `Sewer`
  - `Street`
  - `Water`

The address data fields (i.e. `Situs 1`) typically embed a newline character, likely for display purposes. This is a nuisance for us, replace the newline character with a space.

You must save the data into subsections, so the Building Information data is inside a sub dictionary, keyed by "`Building Info`" and the Land Information is inside a sub dictionary, keyed by "`Land Info`".

Save the data as a JSON file called `washoeProperty_searchTerm.txt`, where `searchTerm` is the search term from the command line input.

Your output file should look something like (`search_term = vine`):


```
{
    "002-152-05": {
        "Situs": "810 VINE ST RENO NV 89503",
        "Owner": "KAISER FAMILY TRUST",
        "Building Info": {
            "Bld #1 Situs": "810 VINE ST",
            "Quality": "R30 Average",
            "Building Type": "Single Family Residence",
            "Stories": "1 Story",
            "Year Built": "1942",
            "WAY": "1950",
            "Bedrooms": "2",
            "Square Feet": "1269",
            "Full Baths": "2",
            "Finished Bsmt": "0",
            "Half Baths": "0",
            "Unfin Bsmt": "0",
            "Fixtures": "8",
            "Fireplaces": "1",
            "Gar Conv Sq Feet": "0",
            "Heat Type": "FA/AC",
            "Total Garage Area": "0",
            "Exterior Walls": "BRICK VENEER ON FRAME",
            "Detached Garage": "380",
            "Basement Gar Door": "0",
            "Roof Cover": "COMPOSITION SHINGLE",
            "Sub Floor": "WOOD",
            "% Complete": "100",
            "Frame": "FRAME",
            "Obso/Bldg Adj": "0",
            "Units/Bldg": "1",
            "Units/Parcel": "1"
        },
        "Land Info": {
            "Size": "0.173 Acres",
            "Sewer": "Municipal",
            "Street": "Paved",
            "Water": "Muni"
        }
    },
    "002-152-06": {
        "Situs": "814 VINE ST RENO NV 89503",
        "Owner": "CHIARITO 2018 LIVING TRUST, CLAUDIA",
```

[IS 615 only] Submit just one file, but your program also needs to output a CSV file, as well as the JSON file. Use the vertical bar as the delimiter character. You should only output a column if there is data somewhere in it. This will be an issue in the Building Information section. If none of the results have a value for a particular key, it should not be a column in your CSV data. Make sure that the keys remain in the order that they appear on the webpage, so all the Land keys should be after the Building keys, which are after the Situs and Owner keys.

Name your CSV file `washoeProperty_searchTerm_CSV.txt`. Your output should look something like (`search_term = vine` and `num_results = 3`):

```
1 APN|Situs|Owner|Bldg_Bld #1 Situs|Bldg_Quality|Bldg_Building
  Type|Bldg_Stories|Bldg_Year Built|Bldg_WAY|Bldg_Bedrooms|Bldg_Square
  Feet|Bldg_Full Baths|Bldg_Finished Bsmt|Bldg_Half Baths|Bldg_Unfin
  Bsmt|Bldg_Fixtures|Bldg_Basement Type|Bldg_Fireplaces|Bldg_Gar Conv Sq
  Feet|Bldg_Heat Type|Bldg_Total Garage Area|Bldg_Exterior Walls|Bldg_Detached
  Garage|Bldg_Basement Gar Door|Bldg_Roof Cover|Bldg_Sub Floor|Bldg_%
  Complete|Bldg_Frame|Bldg_Obso/Bldg
  Adj|Bldg_Units/Bldg|Bldg_Units/Parcel|Land_Size|Land_Sewer|Land_Street|Land_Water
2 002-152-05|810 VINE ST RENO NV 89503|KAISER FAMILY TRUST|810 VINE ST|R30
  Average|Single Family Residence|1
  Story|1942|1950|2|1269|2|0|0|0|8||1|0|FA/AC|0|BRICK VENEER ON
  FRAME|380|0|COMPOSITION SHINGLE|WOOD|100|FRAME|0|1|1|0.173
  Acres|Municipal|Paved|Muni
3 002-152-06|814 VINE ST RENO NV 89503|CHIARITO 2018 LIVING TRUST, CLAUDIA|814 VINE
  ST|R30 Average|Single Family Residence|1
  Story|1939|1939|2|1825|2|348|0|1133|9|DUGOUT|1|0|FORCED AIR|0|BRICK VENEER ON
  FRAME|308|0|COMPOSITION SHINGLE|WOOD|100|FRAME|0|1|1|0.156
  Acres|Municipal|Paved|Muni
4 002-152-07|820 VINE ST RENO NV 89503|WYNNYCZUK, PETER J|820 VINE ST|R30
  Average|Single Family Residence|1
  Story|1941|1941|2|1203|1|216|0|192|5|DUGOUT|1|0|FORCED AIR|0|BRICK VENEER ON
  FRAME|220|0|COMPOSITION SHINGLE|WOOD|100|FRAME|0|1|1|0.187
  Acres|Municipal|Paved|Muni
5
```