

# **PROJECT 3: SEMANTIC DATA RETRIEVAL CECS 571**



<https://github.com/parthshah1/CECS-571-Project-3>

**Team 7**

- Nikhil Parekh
- Mayur Patil
- Parth Shah
- Meet Shah



# Selected Dataset



We wanted to select a dataset which can have an impact.

We selected dataset which gave information regarding planting space, populated plantation and suitable habitat for certain plants and species.

Furthermore, we wanted two such datasets of one place using which we can get a idea of cleared land in parks where we can certain plant that matches its habitat type.

# Dataset

1

A	B	C	D	E	F	G	H	I	
1	OBJECTID	Borough	Number	Street	PSSite	PlantingSp	Width	Length	ParkName
2	283721	Brooklyn	62	RIVER STR	Street		0	0	
3	7669836	Queens			Park		0	0	Astoria Park
4	7123408	Brooklyn			Park		0	0	Asser Levy
5	4984076	Queens	22-23	149 ST	Street		0	0	
6	7187037	Queens			Park		0	0	Juniper Park
7	7187023	Brooklyn			Park		0	0	Marine Park
8	1023281	Queens			Park		0	0	Kissena Park
9	7174401	Bronx			Park		0	0	Garrison Park
10	7110794	Brooklyn			Park		0	0	Farmers Park
11	5255314	Manhattan			Park		0	0	
12	727664	Manhattan			Street		0	0	
13	5019824	Queens	Jan-14	MALBA DF	Street		0	0	

2

A	B	C	D	E	F	G	H
1	Parkname	Sanctuary	Borough	Acres	Directions	Description	HabitatType
2	Arden Heights Woods	Private	Staten Island	185	<B>Public Transit	<p>Most of Arden Heights Woods is a forest, with some freshwater wetlands.	
3	Blue Heron Park	Preserve	Staten Island	169	<B>Public Transit	<p>Blue Heron Park is a mix of forest, grassland, shrubland, and wetlands.	
4	Clove Lake Park	Preserve	Staten Island	131	<B>Public Transit	<p>Clove Lake Park is a mix of forest, meadow, salt marsh, and freshwater wetlands.	
5	Conference House Park	State	Staten Island	105	<B>Public Transit	<p>Long before it became a park, it was a forest, with some freshwater wetlands.	
6	Deer Park Preserve		Staten Island	40	<B>Public Transit	<p>Kettle hole Forest	
7	Eibs Pond Park	Preserve	Staten Island	39	<B>Public Transit	<p>In 1987, the park was created from a grassland, freshwater wetland, and forest.	
8	Evergreen Park	Preserve	Staten Island	22	<B>Public Transit	<p>Although it is a park, it is still a forest.	
9	Isle of Meadows	Preserve	Staten Island	100	<B>Isle of Meadows	<p>Isle Of Meadows is a mix of meadow, salt marsh, and freshwater wetlands.	
10	Islington Pond Park	Private	Staten Island	22	<B>Public Transit	<p>Islington Pond Park is a mix of forest, grassland, and freshwater wetlands.	
11	Lemon Creek Park	Preserve	Staten Island	16	<B>Public Transit	<p>Lemon Creek Park is a mix of salt marsh, freshwater wetlands, and forest.	
12	Long Pond Park	Preserve	Staten Island	115	<B>By Car: </B> Take	<p>Long Pond Park is a mix of forest, grassland, and freshwater wetlands.	
13	Pralls Island Harbor	Heritage	Staten Island	74	<B>Pralls Island Pres	<p>The Pralls Island Preserve is located in a salt marsh.	
14	Reeds Basket Willow	State	Staten Island	49	<B>Public Transit	<p>Reed's Basin is a mix of forest, grassland, and freshwater wetlands.	

- 
- 1 First we mapped all the properties useful for SPARQL query.
  - 2 According to the properties we rearranged and normalized the dataset.
  - 3 Improving data properties, based on our previous ontology.

# Normalizing Dataset

B	C	D	E	F	G	H	I	J
ParkID	Name	ParkZone	Acre	Latitude	Longitude	HabitatType	isSituatedIn	hasSite
1	Alley Pond Park Preserve	B018-ZN01	549	40.74160122	-73.7486545	Forest, Salt Marsh, Freshwater Wetland	Borough1	PlantingSpaceSit
2	Arden Heights Woods Preserve	B018-ZN01	185	40.55116029	-74.1891473	Forest, Freshwater Wetland	Borough2	PlantingSpaceSit
3	Bloomingdale Park Preserve	B018-ZN01	110	40.53354232	-74.2226359	Forest, Freshwater Wetland	Borough2	PlantingSpaceSit
4	Blue Heron Park Preserve	B018-ZN03	169	40.52594952	-74.1758644	Forest, Grassland, Shrubland, Freshwater Wetlan	Borough2	PlantingSpaceSit
5	Bronx Park Preserve	B018-ZN04	35	40.74891263	-73.7223383	Forest, Freshwater Wetland	Borough3	PlantingSpaceSit
6	Central Park Preserve	B018-ZN04	34	40.74760146	-73.7205167	Forest	Borough4	PlantingSpaceSit
7	Central Park Preserve	B019	119	40.7471757	-73.7206077	Forest	Borough4	PlantingSpaceSit
8	Clove Lake Park Preserve	B023	131	40.74705437	-73.7233499	Forest, Meadow, Salt Marsh, Freshwater Wetland	Borough2	PlantingSpaceSit
9	Conference House Park Preserves	B028-ZN01	105	40.74660212	-73.7209472	Forest, Freshwater Wetland	Borough2	PlantingSpaceSit
10	Cunningham Park Preserve	B028-ZN01	243	40.74784211	-73.722292	Forest, Freshwater Wetland	Borough1	PlantingSpaceSit
11	Deer Park Preserve	B029-ZN05	40	40.74736185	-73.7202592	Forest	Borough2	PlantingSpaceSit
12	Dubos Point Wildlife Sanctuary	B029-ZN06	33	40.74579605	-73.7230163	Grassland, Salt Marsh	Borough1	PlantingSpaceSit
13	Eibs Pond Park Preserve	B029-ZN06	39	40.74747341	-73.7202506	Grassland, Freshwater Wetland	Borough2	PlantingSpaceSit
14	Evergreen Park Preserve	B032-ZN01	22	40.7486303	73.7207047	Forest	Borough2	PlantingSpaceSit
15	Fairview Park Preserve	B032-ZN01	22	40.74679302	-73.7211678	Forest, Freshwater Wetland	Borough2	PlantingSpaceSit
16	Flushing Meadows-Corona Park	B032-ZN01	106	40.74726255	-73.7203882	Freshwater Wetland	Borough1	PlantingSpaceSit
17	Forest Park Preserve	B035	274	40.74783938	-73.7197013	Forest	Borough1	PlantingSpaceSit
18	Four Sparrow Marsh Preserve	B042	67	40.74731725	-73.7208819	Salt Marsh	Borough6	PlantingSpaceSit
19	Fresh Creek Park Preserve	B051	92	40.74712616	-73.7211977	Salt Marsh	Borough6	PlantingSpaceSit
20	High Rock Park Preserve	B052	90	40.74721423	-73.7208131	Forest, Freshwater Wetland	Borough2	PlantingSpaceSit
21	Highland Park Preserve	B056	43	40.74651207	-73.7219268	Forest, Freshwater Wetland, Meadow	Borough1	PlantingSpaceSit
22	Idlewild Park Preserve	B056	242	40.74687224	73.720557	Grassland, Salt Marsh, Freshwater Wetland	Borough1	PlantingSpaceSit
23	Inwood Hill Park	B058	136	40.74719646	, -73.7192304	Forest, Salt Marsh	Borough4	PlantingSpaceSit
24	Isle of Meadows Preserve	B058-ZN01	100	40.74160122	-73.7486545	Meadow, Salt Marsh	Borough2	PlantingSpaceSit
25	Islington Pond Park Preserve	B058-ZN01	22	40.55116029	-74.1891473	Forest, Freshwater Wetland	Borough2	PlantingSpaceSit
26	Kempton Creek Park Preserve	B059-ZN02	16	40.52354222	-74.2226359	Salt Marsh, Freshwater Wetland, Forest	Borough2	PlantingSpaceSit

Park	Sanctury	PSSite	Borough	PSStatus	
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# METHOD

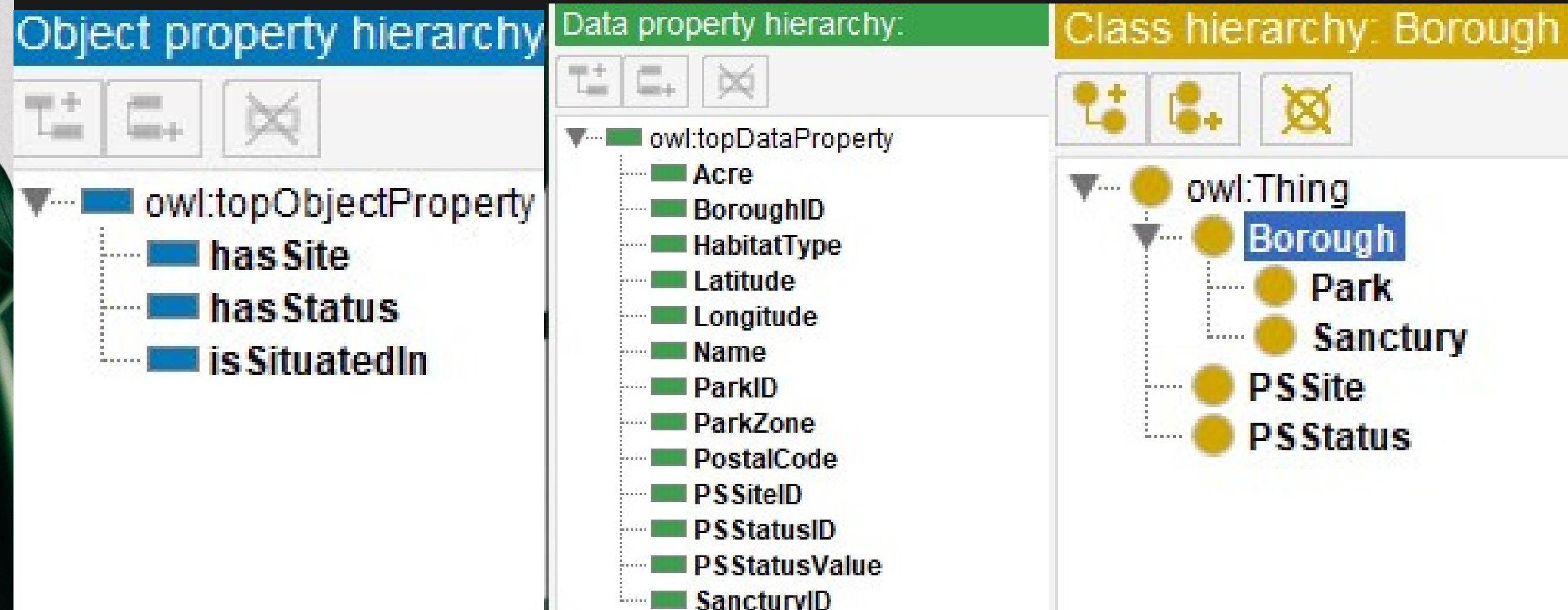
**Process : Developing SPARQL query  
and displaying the output in HTML.**

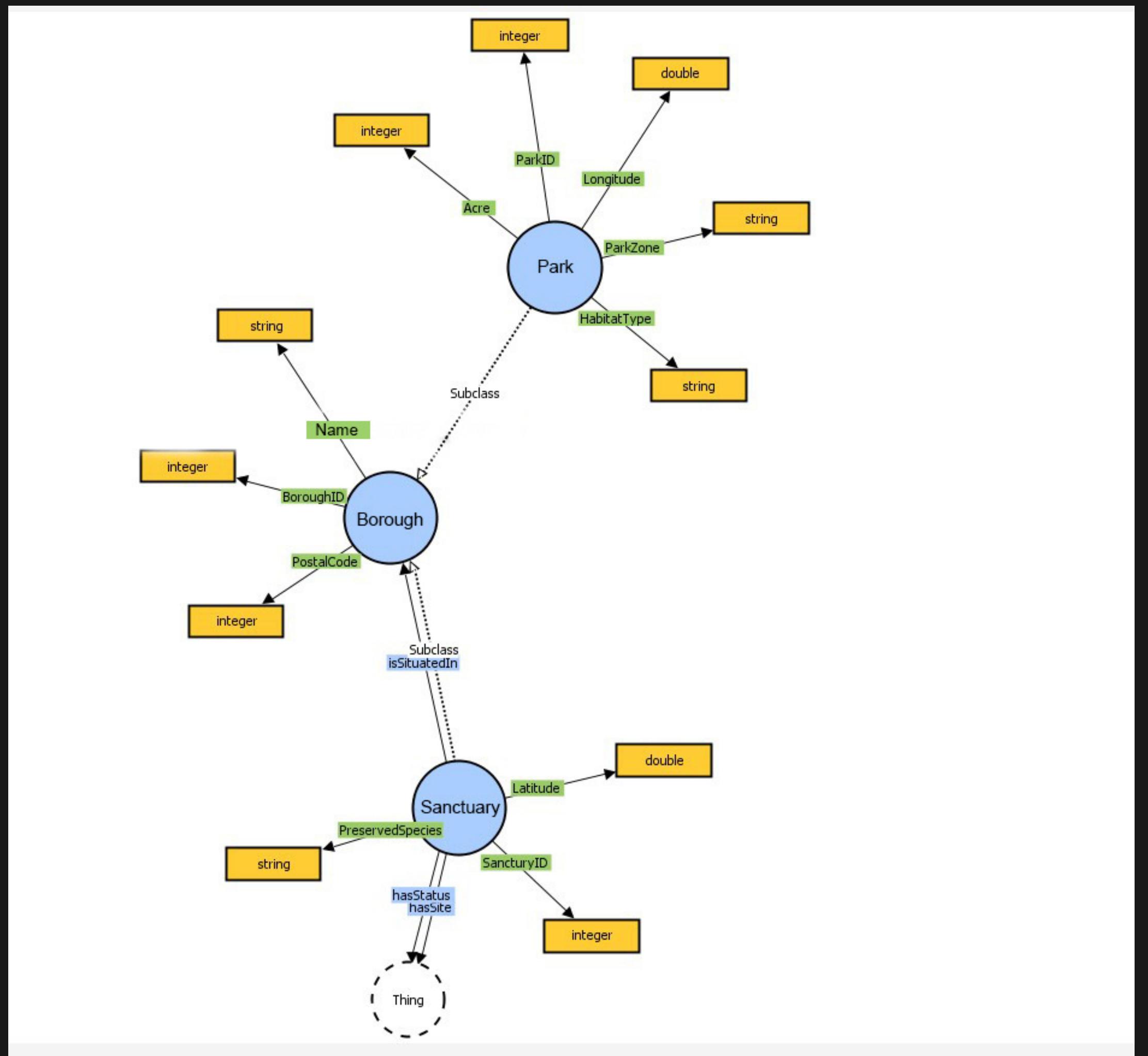
**Steps:-**

- 1. Used the normalized dataset to  
create insightful query.**
- 2. Used Apache-Jena Fuseki as the  
server.**
- 3. Built the web application using  
flask (Python).**
- 4. Hardcoded the SPARQL query in  
the code.**
- 5. Execute Python Code to display  
result in HTML.**



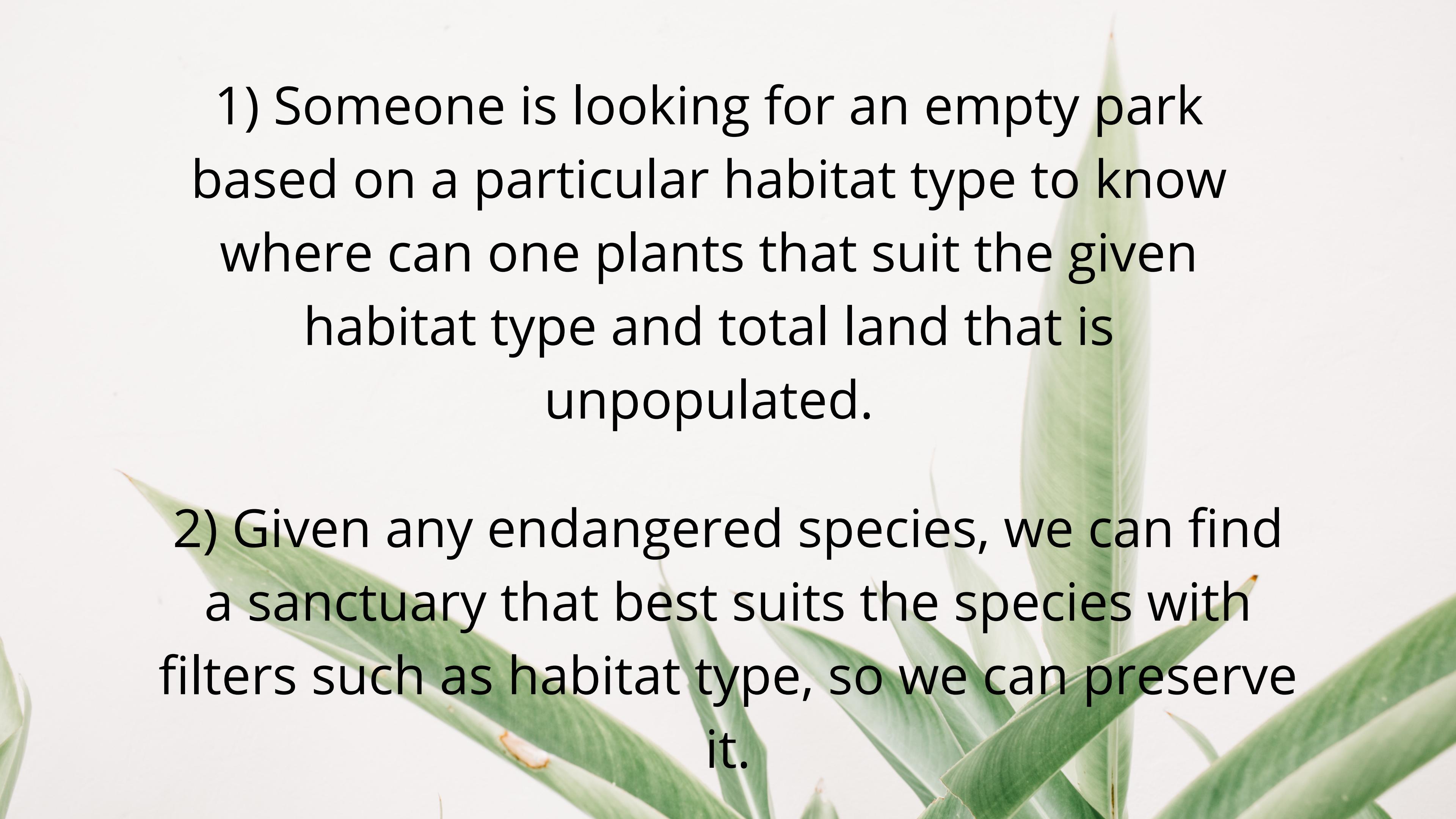
# ONTOLOGY RELATIONSHIP







# Queries?

A close-up photograph of several large, vibrant green leaves with prominent veins, creating a natural and organic background.

1) Someone is looking for an empty park based on a particular habitat type to know where one can plant species that suit the given habitat type and total land that is unpopulated.

2) Given any endangered species, we can find a sanctuary that best suits the species with filters such as habitat type, so we can preserve it.

A close-up photograph of several green leaves with water droplets against a dark background. The leaves are elongated and have a slightly ribbed texture. The water droplets are scattered across the surface of the leaves, catching the light. The overall composition is moody and natural.

**FINAL OUTPUT**

# CECS 571 Project 3

Home Park Sanctuary NoOfSancturySpeciesWise

Search

## Park Details

Park Name	Borough	Acre	Status	Habitat Type	Map
Dubos Point Wildlife Sanctuary	Queens	33	Empty	Grassland, Salt Marsh	
Inwood Hill Park	Manhattan	136	Empty	Forest, Salt Marsh	
Isle of Meadows Preserve	Staten Island	100	Empty	Meadow, Salt Marsh	
Marine Park Preserve	Brooklyn	530	Empty	Grassland, Salt Marsh	
Neck Creek Preserve	Staten Island	20	Empty	Salt Marsh	
Pelham Bay Park	Bronx	371	Empty	Salt Marsh, Forest	
Pralls Island Harbor Herons Preserve	Staten Island	74	Empty	Salt Marsh	
Saw Mill Creek Marsh Preserve	Staten Island	117	Empty	Salt Marsh	
Udalls Cove Park Preserve	Queens	31	Empty	Forest, Salt Marsh, Freshwater Wetland	

# CECS 571 Project 3

NoOfSanctuarySpeciesWise

Search

## Sanctuary Details

Park Name	Borough	Acre	HabitatType	Status	Species
Willow Lake Preserve	Queens	106	Freshwater Wetland	Populated	Warblers, White-Crowned Sparrows, Blackbirds
Raoul Wallenberg Forest Preserve	Bronx	112	Forest	Populated	Downy Woodpeckers, Red-tailed hawks, White-Crowned Sparrows
Ridgewood Reservoir	Queens	43	Forest, Freshwater Wetland, Meadow	Populated	Herons, Herring Gulls, Downy Woodpeckers, White-Crowned Sparrows, Ring-Necked Ducks



# Technical Challenges

- Finding relationships between classes and creating a SPARQL query.
- Setting up flask server.
- Normalizing Dataset.
- Formatting JSON output in the HTML code.



**CODE SNIPPET**

File Edit View Navigate Code Refactor Run Tools Git Window Help ForestPantingSpaceOntology - App.py

ForestPantingSpaceOntology

Project Commit Pull Requests Structure Favorites

App.py sanctury.html menu.html nofsanctury\_specieswise.html park.html index.html header.html base.html

```
55     FILTER regex(?parkname, "", "i")
56 }
57 """
58
59     r = requests.get(url, params={'format': 'json', 'query': query})
60     results = r.json()
61     #print(results)
62     return render_template("park.html", data=results)
63
64
65 @app.route('/sanctury')
66 def Sanctury():
67     title="Park"
68     url = 'http://localhost:3030/PSOnto/sparql'
69     query = prefixquery + """ SELECT ?x ?sancturynname ?boroghname ?acre ?htype ?species ?status ?PCODE WHERE
70 {
71     ?x a test:Sanctury .
72     ?x test:Name ?sancturynname .
73     ?x test:Acre ?acre .
74     ?x test:HabitatType ?htype .
75     ?x test:PreservedSpecies ?species .
76     ?x test:isSituatedIn ?y .
77     ?y test:Name ?boroghname .
78     ?y test:PostalCode ?PCODE .
79     ?x test:hasStatus ?z .
80     ?z test:PSStatusValue ?status .
81     ?y test:PostalCode ?PCODE .
82     ?x test:hasStatus ?z .
83     ?z test:PSStatusValue ?status .
84     FILTER regex(?status, "emp", "i")
85     FILTER regex(?sancturynname, "", "i")
86     FILTER regex(?htype, "", "i")
87     FILTER regex(?species, "her", "i")
88 }
89 order by ?x
90 """
91
92     r = requests.get(url, params={'format': 'json', 'query': query})
93     results = r.json()
94     return render_template("sanctury.html", data=results)
```

NoofSanctury()

Low disk space on a PyCharm C:\Users\parth\AppData\Local CE2021.1

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Project ▾

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sanctury.html menu.html noofsanctury\_specieswise.html park.html index.html headers.html base.html

File Commit Pull requests

ForestPanIntSpaceOntology / ForestPanIntSpaceOntology / App.py

query2 = prefixquery + """  
SELECT (MAX(?borough\_id)+1 AS ?bid) WHERE { ?x a test:Borough , ?x test:BoroughID ?borough\_id }  
""";  
  
r2 = requests.get(url, params={'format': 'json', 'query': query2})  
results2 = r2.json()  
  
return render\_template("index.html", data=results, data1=results1, data2=results2)  
  
@app.route('/park')  
def Park():  
 title="Park"  
 url = 'http://localhost:3030/PanInt/sparql'  
 query = prefixquery + """  
SELECT ?x ?parkname ?acre ?htype ?bname ?status ?lati ?longi  
WHERE  
{  
?x a test:Park .  
?x test:Name ?parkname .  
?x test:Acre ?acre .  
?x test:HabitatType ?htype .  
?x test:Latitude ?lati .  
?x test:Longitude ?longi .  
?x test:isSituatedIn ?y .  
?y test:Name ?bname .  
?x test:hasStatus ?z .  
?z test:PSStatusValue ?status  
FILTER regex(?htype, "Forest", "i")  
FILTER regex(?status, "emp", "i")  
FILTER regex(?bname, "", "i")  
FILTER regex(?parkname, "", "i")  
}"""  
  
r = requests.get(url, params={'format': 'json', 'query': query})  
results = r.json()  
#print(results)  
return render\_template("park.html", data=results)

Sanctury0

Run: App

Git Run TODO Problems Terminal Python Packages Python Console

Pushed 1 commit to origin/master (4 minutes ago)

Type here to search

BANDICAM UNREGISTERED

00:00:00 0 bytes / 213.1MB

1920x1080 - (0, 0), (1920, 1080) - Display 1

Home Record

General

Video

Image

About

Format - MP4

Video H264 - CPU  
Full Size, 30.00fps, 80q

Audio AAC - Advanced Audio Coding  
48.0KHz, stereo, 192kbps

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