The University of Jordan

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ONTOLOGIES AND KNOWLEDGE GRAPHS

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Tourism Domain

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Part 1 – Initiation

1.1. Ontology scenario

What is Ontology?

Ontology is a framework or model used to organize knowledge in a specific domain in a structured and logical manner. It aims to represent the main concepts and their relationships in such a way that they can be stored in automated information systems and retrieved easily. Ontology bridge philosophy and information science to improve methods for recording and organizing knowledge.

Project Idea

In this project, we are building an ontology focused on the tourism domain. The primary objective is to create a structured representation of knowledge related to tourism, encompassing key elements such as tourist destinations, hotels, transportation options, travel packages, and activities. This ontology will act as a centralized knowledge base, enabling better organization and retrieval of tourism-related information, and fostering seamless communication between systems and users.

Example Scenario

A tourist uses the system to plan their trip by entering details like the destination they want to visit, their budget, and the activities they are interested in. The system, based on the ontology, suggests nearby hotels, activities that match their interests, and creates a complete travel plan. This makes planning easier and helps tourists have a better experience.

Purpose: The goal of the ontology is to provide a structured knowledge base that enhances the tourist experience by offering accurate and organized information about tourist destinations, accommodations, transportation options, and travel packages. The ontology aims to make tourism-related data more accessible and usable for various stakeholders, including tourists, travel agents, hotel managers, and app developers. We have extended this ontology and integrated it with other knowledge bases like DBpedia and Wikidata, which enhances its ability to provide rich and up-to-date information. This integration ensures the ontology is continuously updated and offers real-time, accurate information to users.

Potential Users:

1. **Tourists:**

   Primary users seek personal recommendations for destinations, hotels, and activities. They use tools like recommended systems to plan their trips more effectively and efficiently.

2. **Travel Agents and Tour Operators:**

   They use tourism-related data to design customized travel packages, tours, and itineraries for different types of tourists. They rely on structured knowledge to provide tailored services to clients.

3. **Developers**:

   Software developers use tourism ontologies to integrate the structured data into smart applications, for example: travel apps, booking platforms. They may work on creating tools that help tourists navigate the available options based on their preferences.

4. **Service Providers:**

They can use the data to offer services that complement tourist activities, such as transportation options or dining experiences.

5. **Tourism Regulatory Bodies**:

are institutions or organizations responsible for regulating and monitoring tourism activities in a specific region or country. These bodies establish policies, laws, and standards that govern the tourism industry to ensure its sustainability, safety, and quality. They also work to protect tourists' rights and regulate the standards of tourism facilities such as hotels and travel agencies.

6. A **tourist guide**:
   is a person specialized in providing information and guidance to tourists about tourist destinations, cultural landmarks, and historical sites in a particular location. The guide offers accurate and reliable information that helps tourists understand the history and culture of the area, as well as directing them during their trips and organizing tourist activities. A tourist guide can be a local with in-depth knowledge of the area or a specialist in a specific field such as eco-tourism or cultural tourism.

Possible Uses:

1. **Recommendations**: Tourism ontologies can provide personalized recommendations for tourist attractions, hotels, restaurants, and activities based on a tourist's preferences, past experiences, or demographic data. This helps tourists plan trips more effectively and enjoy customized experiences

2. **Comparison of Options**: Tourists can compare various options such as hotel prices, flight schedules, transport options, or available tours, helping them choose the best value or most suitable services.

3. **Event Management**: Ontologies can be used to manage and recommend events, festivals, or seasonal activities based on current trends, availability, and tourist preferences, ensuring that the information is up-to-date and relevant.

4. Through modern technology applications, the tourist experience can be enhanced using tourism ontologies. Smart recommendation systems and virtual assistants provide personalized recommendations based on user preferences. These applications help deliver accurate information about tourist destinations, accommodations, transportation options, and activities, while also enabling comparisons between prices and available options. They allow for the customization of flexible travel packages and offer real-time updates on local activities, making it easier for tourists to plan and make informed decisions.

1.2 Ontology Scope

The ontology focuses on the tourism sector and includes several key areas related to the tourist experience. These areas are:

Accommodation: Includes all types of places where tourists can stay, such as hotels, resorts, and apartments.

Activity: Covers the various activities tourists can engage in during their trips, such as tours, water sports, and cultural events.

Destination_and_Attraction: Includes the tourist spots and attractions, such as historical landmarks and natural wonders.

Food and Beverage: Involves places offering food and drinks, such as restaurants and cafes.

Goals: Refers to the purpose of travel, such as medical tourism, education, or leisure.

Stakeholders: Includes all parties involved in tourism, such as companies, government agencies, and tourism organizations.

Technology: Relates to the technologies and information that help tourists plan their trips, such as apps and websites.

Transportation: Covers the various modes of transport used by tourists, such as planes, trains, and ships.

1.3 Ontology Knowledge Sources

To create this ontology, we will use two main sources of knowledge:

(https://transportgeography.org/contents/applications/tourism-transport/, n.d.)

(https://glitzcamp.com/blogs/types-of-accommodation/#:~:text=Hotels%20are%20the%20most%20common, 2024)

(https://github.com/drex7001/tourism-ontology/blob/master/new.owl, n.d.)
(https://www.researchgate.net/publication/226382720_Developing_An_Owl_Ontology_For_e-Tourism, n.d.)

(https://github.com/OnToologyUser/HalalTourismOntology/blob/main/hto_v_2.1.owl, n.d.)

(https://www.lettria.com/blogpost/3-methodologies-for-ontology-development, n.d.)

Part 2: Ontology Design

2.1. Describe the conceptualization approach

We used the **Middle-Out** approach, which mixes both Bottom-Up and Top-Down methods. This made our work easier and saved us from doing things over again. The **Middle-Out** method gives a clearer view compared to just using Top-Down. Unlike Bottom-Up, which needs a lot of detailed data, Middle-Out is simpler and more cost-effective.

First, we started by picking out the main ideas in the tourism field, like Accommodation, Transportation, Destinations, and activities. Then, we connected these ideas with relationships like hasAccommodation, providesTransportation, and hasAttraction. This helped us create a clear and connected structure for the tourism domain.

2.2. Define concept glossary and relationship glossary

Provide definitions for each concept

Concept	Definition	Source	Class Name Source
Accommodation	a place to stay or live.	**ACCOMMODATION | English meaning - Cambridge Dictionary**	tourism-ontology/new.owl at master · drex7001/tourism-ontology
Aparthotel	An apartment hotel or aparthotel (also residential hotel,or extended-stay hotel) is a serviced apartment complex that uses a hotel-style booking system.	**Apartment hotel - Wikipedia**	
Bed	A bed is an item of furniture that is used as a place to sleep, rest, and relax.	**Bed - Wikipedia**	
Breakfast	is the first meal of the day usually eaten in the morning.	**Breakfast - Wikipedia**	
Homestay	is a form of hospitality and lodging whereby visitors share a residence with a local of the area (host) to which they are traveling.	**Homestay - Wikipedia**	
Hotel	A hotel is an establishment that provides paid lodging on a short-term basis.	**Hotel - Wikipedia**	tourism-ontology/new.owl at master · drex7001/tourism-ontology

Motel	A motel, also known as a motor hotel, motor inn or motor lodge, is a hotel designed for motorists, usually having each room entered directly from the parking area for motor vehicles rather than through a central lobby.	**Motel - Wikipedia**	
Resort	A resort means a town which people visit for holidays and day trips, typically containing hotels where holidaymakers stay.	Resort - Wikipedia	
Activity	An activity is something you do, or just the state of doing.	**Activity - Definition, Meaning & Synonyms | Vocabulary.com**	tourism-ontology/new.owl at master · drex7001/tourism-ontology
Diving	is the sport of jumping or falling into water from a platform or springboard, usually while performing acrobatics.	**Diving (sport) - Wikipedia**	
Health care	Health care, or healthcare, is the improvement of health via the prevention, diagnosis, treatment, amelioration or cure of disease, illness, injury and other physical and mental impairments in people.	**Health care - Wikipedia**	
Hiking	A hike is a long, vigorous walk, usually on trails or footpaths in the countryside.	**Hiking - Wikipedia**	tourism-ontology/new.owl at master · drex7001/tourism-ontology
Product	an item that can be offered to a market to satisfy the desire or need of a customer.	**Product - Wikipedia**	

Wildlife Safari	is a drive-through safari and zoological park in Winston, Oregon, United States.	**Wildlife Safari - Wikipedia**	tourism-ontology/new.owl at master · drex7001/tourism-ontology
Destination	The destination of someone or something is the place to which they are going or being sent.	**DESTINATION definition and meaning | Collins English Dictionary**	tourism-ontology/new.owl at master · drex7001/tourism-ontology
Castle	A castle is a type of fortified structure built during the Middle Ages predominantly by the nobility or royalty and by military orders.	**Castle - Wikipedia**	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Cave	A **cave** or **cavern** is a natural void under the Earth's surface.	Cave - Wikipedia	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Library	is a collection of books, and possibly other materials and media, that is accessible for use by its members and members of allied institutions.	Library - Wikipedia	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Museum	is an institution dedicated to displaying and/or preserving culturally or scientifically significant objects.	**Museum - Wikipedia**	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Place of worship	is a specially designed structure or space where individuals or a group of people such as a congregation come to perform acts of devotion, veneration, or religious study.	**Place of worship - Wikipedia**	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Church	church building, or church house is a building used for Christian worship services and other Christian religious activities.	**Church (building) - Wikipedia**	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia

Mosque	also called a masjid is a place of worship for Muslims.	**Mosque - Wikipedia**	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Shrine	is a sacred space dedicated to a specific deity, ancestor, hero, martyr, saint, daemon, or similar figure of respect, wherein they are venerated or worshipped.	**Shrine - Wikipedia**	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Theatre	is a collaborative form of performing art that uses live performers, usually actors or actresses, to present experiences of a real or imagined event before a live audience in a specific place, often a stage.	Theatre - Wikipedia	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Tower	A **tower** is a tall structure, taller than it is wide, often by a significant factor.	Tower - Wikipedia	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
University	is an institution of higher (or tertiary) education and research which awards academic degrees in several academic disciplines.	**University - Wikipedia**	
Country	A country is a distinct part of the world, such as a state, nation, or other political entity.	**Country - Wikipedia**	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
City	is a human settlement of a substantial size.	City - Wikipedia	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
Region	A particular area or part of the world, or any of the large official areas into which a country is divided.	REGION | English meaning - Cambridge Dictionary	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
Festival event	is a public or private event that is organized for the purpose of celebrating, commemorating or promoting a specific cultural, artistic, religious or social activity.	**What is a festival and what types of festivals are there? - Meetmaps Blog**	

Island	is a piece of land, distinct from a continent, completely surrounded by water.	**Island - Wikipedia**	
Nature	is an inherent character or constitution, particularly of the ecosphere or the universe as a whole.	**Nature - Wikipedia**	
Food	is any substance consumed by an organism for nutritional support.	Food - Wikipedia	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
Beverage	A beverage is a liquid intended for human consumption.	Drink - Wikipedia	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
Café	coffeehouse, coffee shop, or café is an establishment that serves various types of coffee, espresso, latte, americano and cappuccino.	Coffeehouse - Wikipedia	
Mall	shopping mall (or simply mall) is a large indoor shopping center, usually anchored by department stores.	Shopping mall - Wikipedia	
Restaurant	is an establishment that prepares and serves food and drinks to customers.	Restaurant - Wikipedia	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Goal	is an objective that a person or a system plans or intends to achieve.	Goal (disambiguation) - Wikipedia	
Adventure	is an exciting experience or undertaking that is typically bold, sometimes risky.	**Adventure - Wikipedia**	
Ecotourism	is a form of nature-oriented tourism intended to contribute to the conservation of the natural environment.	**Ecotourism - Wikipedia**	

Education	is the transmission of knowledge, skills, and character traits and manifests in various forms.	**Education - Wikipedia**	
Historical culture	is a relatively new concept that encompasses "both material and immaterial culture as well as academic and popular articulations" of history.	**Historical culture - Wikipedia**	
Medical	means relating to illness and injurie and to their treatment or prevention.	MEDICAL definition and meaning | Collins English Dictionary	
Stakeholder	a group, corporate, organization, member, or system that affects or can be affected by an organization's actions.	Stakeholder - Wikipedia	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
Management	is the administration of organizations, whether they are a business, a nonprofit organization.	Management - Wikipedia	
Service provider	is an organization that provides services, such as consulting, legal, real estate, communications, storage, and processing services, to other organizations.	Service provider - Wikipedia	HalalTourismOntology/hto_v_2.1.owl at main · OnToologyUser/HalalTourismOntology
Tourist	is a person who is visiting a place for pleasure and interest, especially when they are on holiday.	TOURIST definition and meaning | Collins English Dictionary	tourism-ontology/new.owl at master · drex7001/tourism-ontology

Tourist guides	are members of the hospitality and travel industry who show visitors around places of interest.	What Does a Tour Guide Do? Definition, Types and Salary | Indeed.com	tourismInApulia/TIAOntology.owl at master · swapUniba/tourismInApulia
Technology	is the application of conceptual knowledge to achieve practical goals, especially in a reproducible way.	Technology - Wikipedia	
Mobile application	is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch.	Mobile app - Wikipedia	
Transportation	is the intentional movement of humans, animals, and goods from one location to another.	Transport - Wikipedia	tourism-ontology/new.owl at master · drex7001/tourism-ontology
Air transport	is that which transports by air, by means of aircrafts, airplanes, etc. Allows the movement of people, goods and mail.	Air Transportation. Types and characteristics	
Plane	a vehicle designed for air travel, with wings and one or more engines.	PLANE | English meaning - Cambridge Dictionary	
Land transport	is the transport or movement of people, animals or goods from one location to another location on land.	Land transport - Wikipedia	

Railways	are the metal tracks on which trains run.	RAILWAY | English meaning - Cambridge Dictionary	
Road	is a thoroughfare for the conveyance of traffic that mostly has an improved surface for use by vehicles (motorized and non-motorized) and pedestrians.	Road - Wikipedia	
Water transport	is the transport of people or goods via waterways.	Maritime transport - Wikipedia	
Boat	is a watercraft of a large range of types and sizes, but generally smaller than a ship, which is distinguished by its larger size or capacity, its shape, or its ability to carry boats.	Boat - Wikipedia	
Ship	is a large vessel that travels the world's oceans and other navigable waterways, carrying cargo or passengers, or in support of specialized missions, such as defense, research and fishing.	Ship - Wikipedia	

Provide definition for each relationship

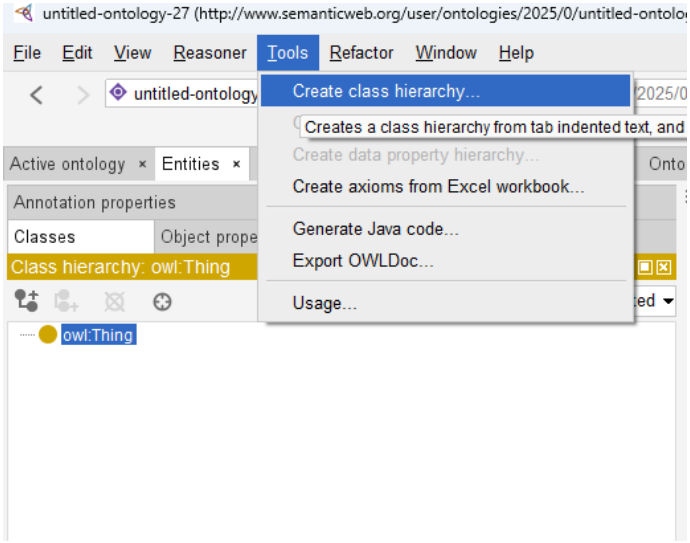
Relationship	Definition
has Attraction	The subject has an attraction towards the object Example: the tourist has attraction to islands.
locatedIn	The subject is located in object Example: the tourist is located in a hotel.
offersActivity	The subject provides activity to object Example: the service _providers offer activities for tourist
preferredActivity	The subject preferred the object's activity Example: the tourist preferred diving
Provides	The subject provides transportation to the object Example: the service _providers provide transportation for the tourist
Recommends	The subject recommends the object Example: tourist _guide recommends the tourist to do diving
recommendsAccommodation	The subject recommends specific accommodation option Example :the tourism websites recommends the tourist specific aparthotel
Arecommends	The subject suggest the object as a preferred option for a particular purpose Example: mobile apps suggest tourist a cafes
Contains	The subject contains object Example: the country contains region
hasAccommodation	The subject includes the object as a place to stay Example: the country hasAccommodation a hotel
Offers	The subject offers activities Example: the service-providers offers activities

Part 3: Logical Coding

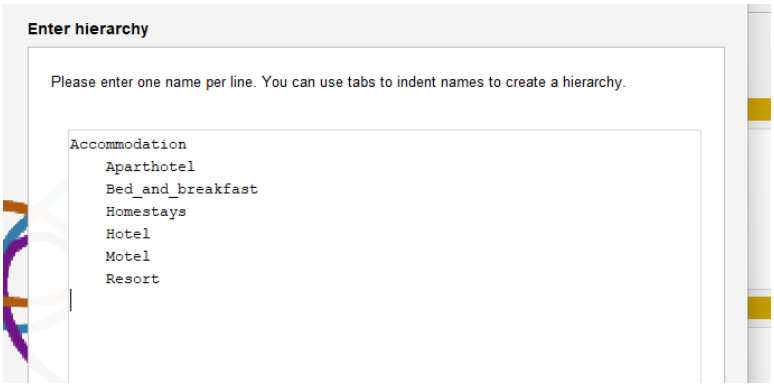
3.1. Define Classes

Started with defining classes in our domain “tourism” as follows :

1- Click on owl:Thing > Tools > Create class hierarchy



2- The hierarchy of “Accommodation” Class , and that has subclasses as showen in the screenshot



3-The hierarchy of class : “Destination_and_Attraction”

```
Destination&Attraction
    Beach
    buildings
        castle
        Cave
        Library
        museum
        PlaceOfWorship
        Theatre
        Tower
        university
    country
        region
            city
    events_festival
        Annually
        Daily
        monthly
        weekly
Islands
nature
```

4- The hierarchy of the classes :

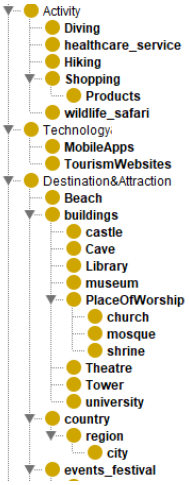
“Activity”,”food_and_beverge”,”Goals”,”stakeholders”,”Technology”,”Transportation”

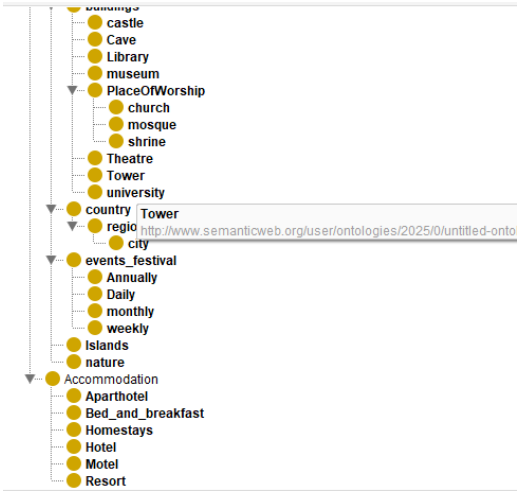
```
Activity
    Diving
    healthcare_service
    Hiking
    Shopping
        Products
    wildlife safari
food_and_beverage
    cafes
    malls
    restaurants
```

```
Goals
    Adventure
    Ecotourism
    education
    Historical_Cultural
    Medical
Stakeholders
    Destination_Management_Organizations
    Service_Providers
    Tourism_Regulatory_Bodies
    tourist
    tourist_guide
Technology
    MobileApps
    TourismWebsites
```

```
Transportation
    AirTransport
        plane
    LandTransport
        Railways
            train
        Roads
            bus
            car
    WaterTransport
        boat
        ship
```

that’s our ontology hierarchy with all classes and subclasses:

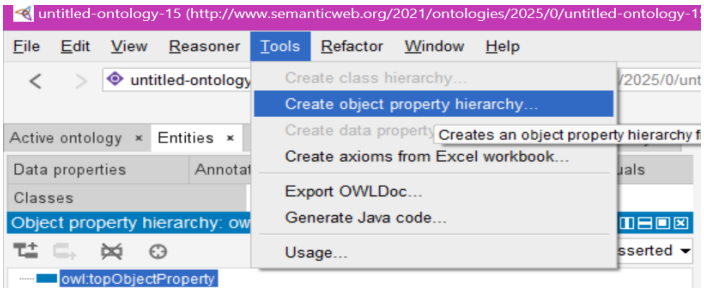




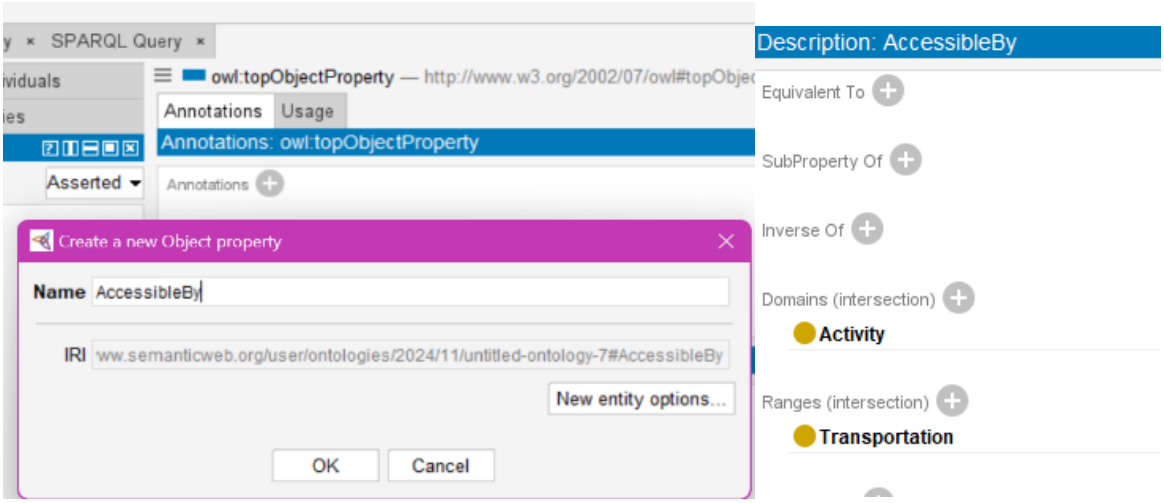
3.2. Define Object Properties and Data properties

First: Defining object property in our domain “tourism” as follows :

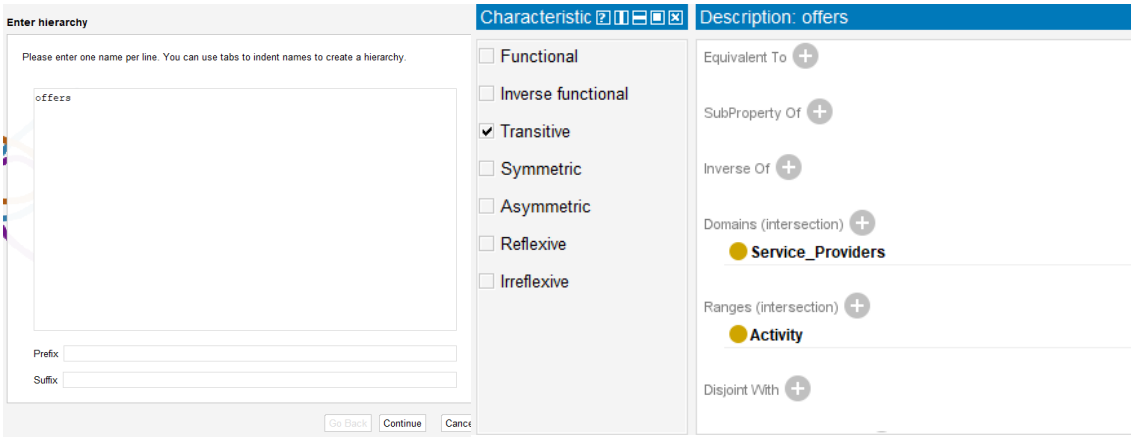
1- Click on owl:topObjectProperty > Tools > Create object property hierarchy



2- The definition of the “ AccessibleBy” property : Indicates that the activity is accessible using transportation.

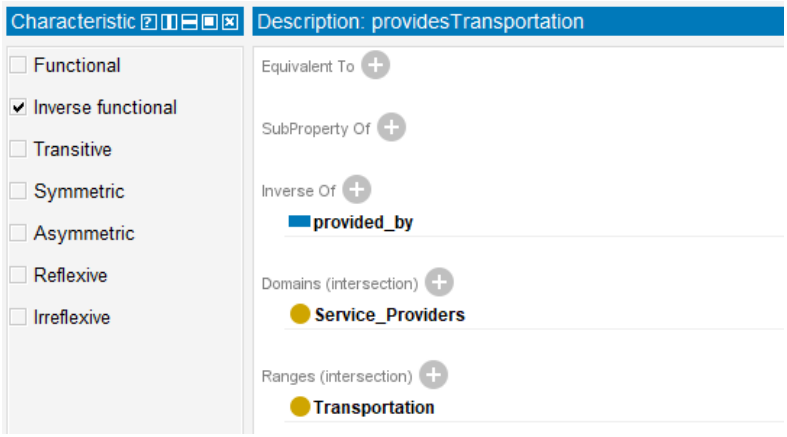


3- The definition of the “offers” property : Indicates that the service providers offers activities to tourists



That object property has characteristic “Transitive” because there is an object property “offersActivity” between service providers and tourist , and there is an object property “preferredActivity” between tourist and Activity .

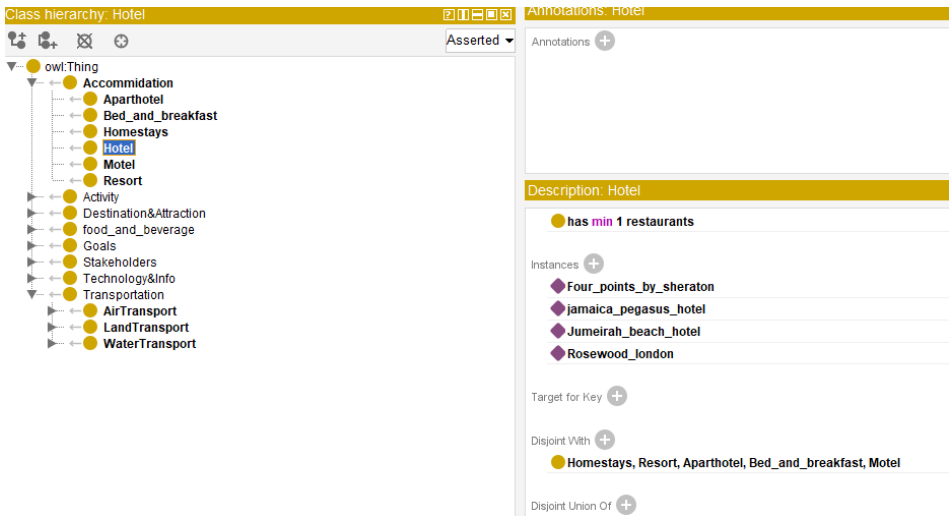
4- The definition of “providesTransportation” :Indicates that the service providers provides transportation. This object property inverse of “provided_by”(Indicates that the transportation provided by service providers).



Disjoint Classes and cardinality restrections :

1- Hotel class : a- disjoint with all other subclasses in accommodation

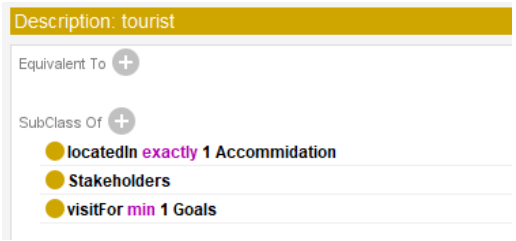
b- Hotel has min one restaurant

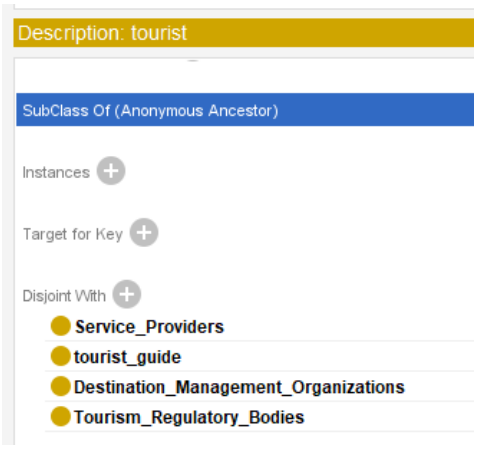


2- Tourist class : a- disjoint with all other subclasses in stakeholders

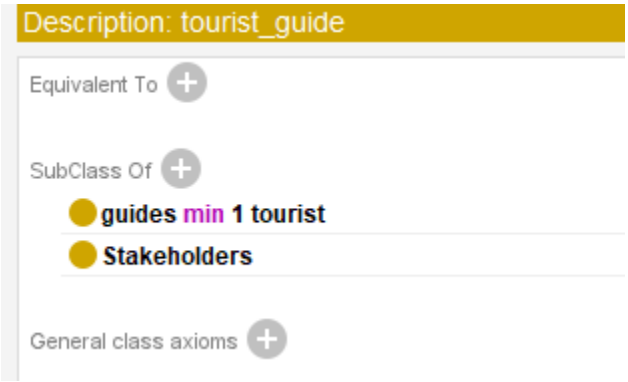
b- tourist located in exactly one accommodation

c- tourist visit for min one goal

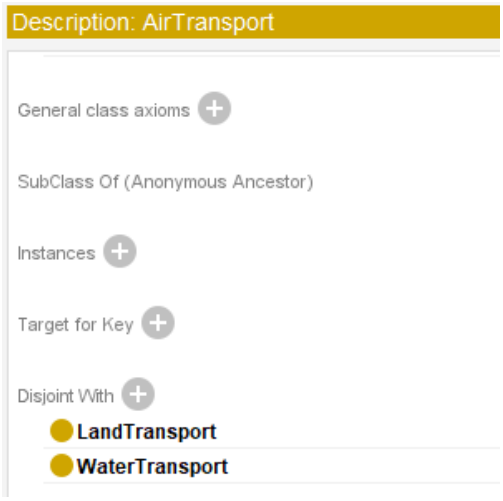




3- Tourist guide : guides min one tourist

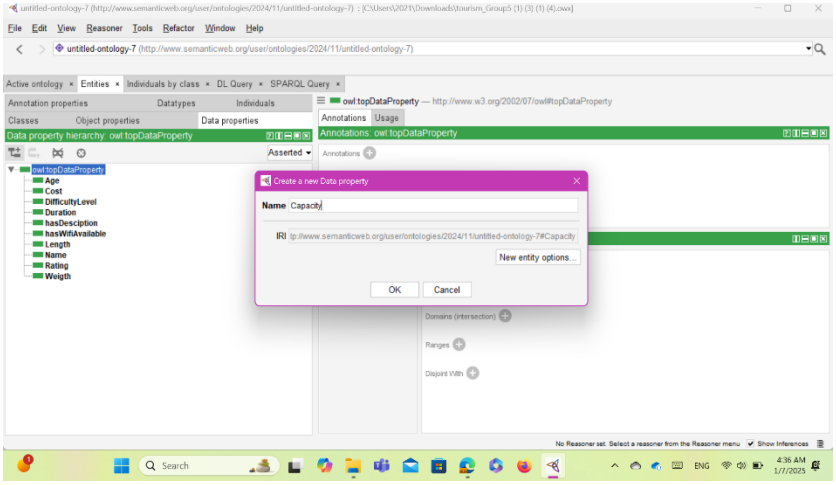


4- AirTransport: disjoint with LandTransport and WaterTransport

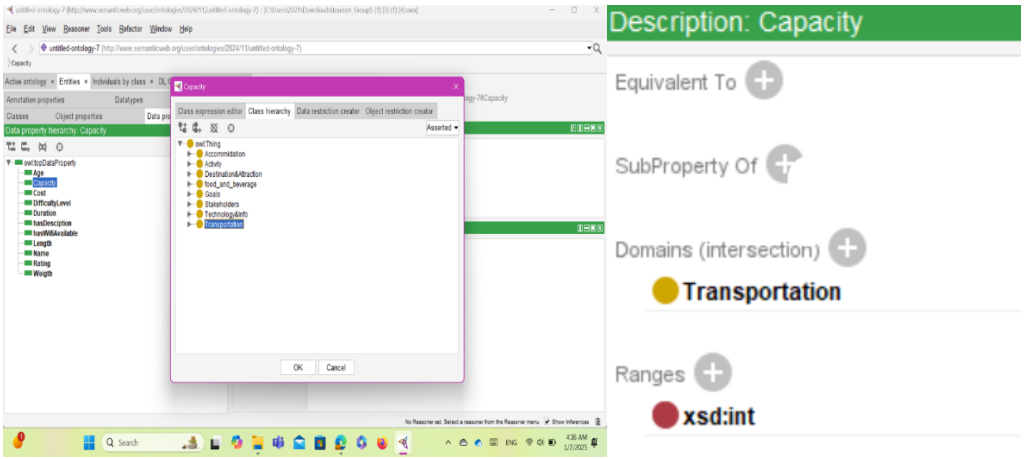


Second: Defining Data property in our domain “tourism” as follows :

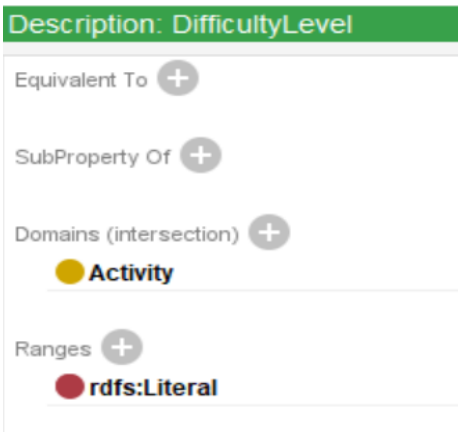
1- Click on this  Then write "Capacity" Data property



2- The Capacity property is associated with the Transportation entity and the range is Integer



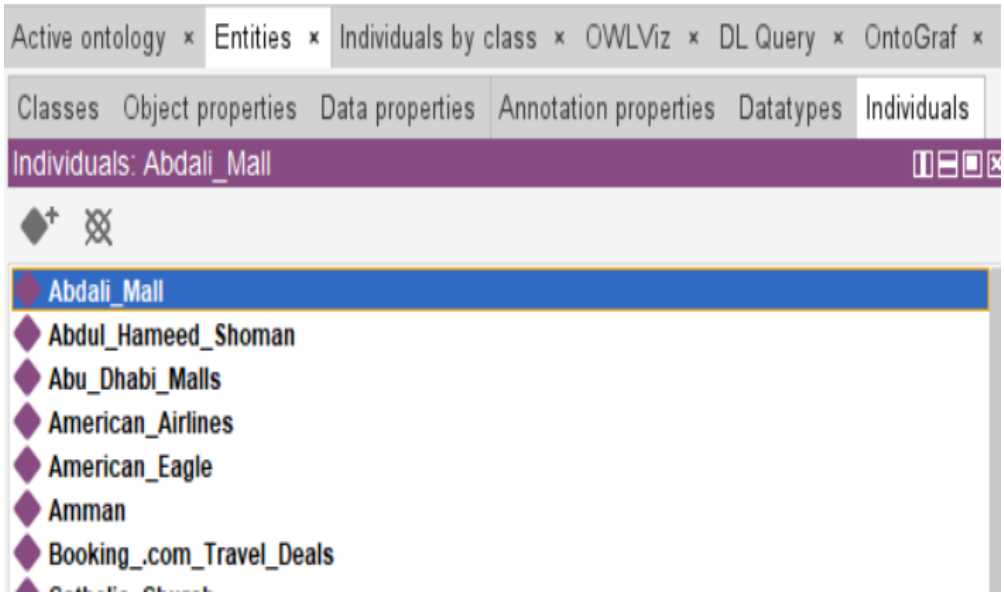
3- the definition of the "DifficultyLevel" property: is associated with the Activity entity and the range is Literal



3.3. Define Instances

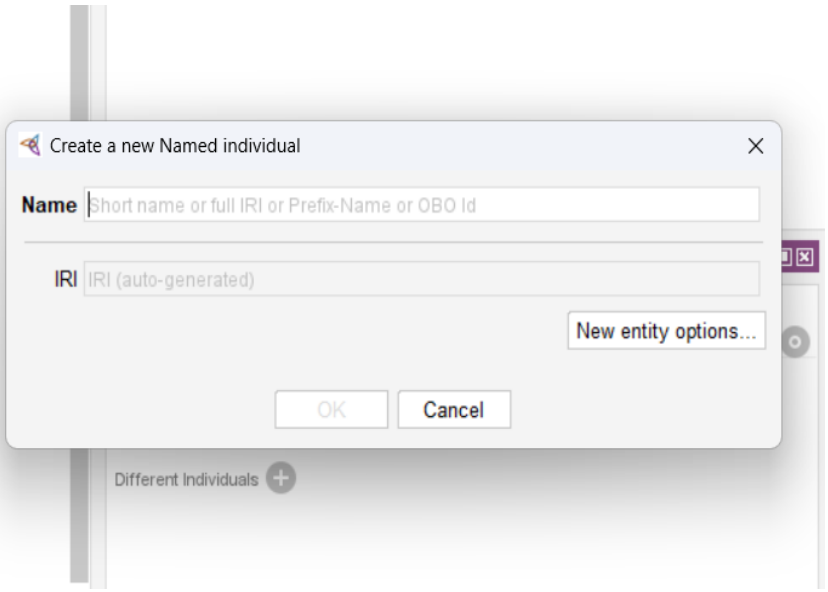
Started with defining individual in our domain “tourism” as follows :

1- click on this  to add individual .



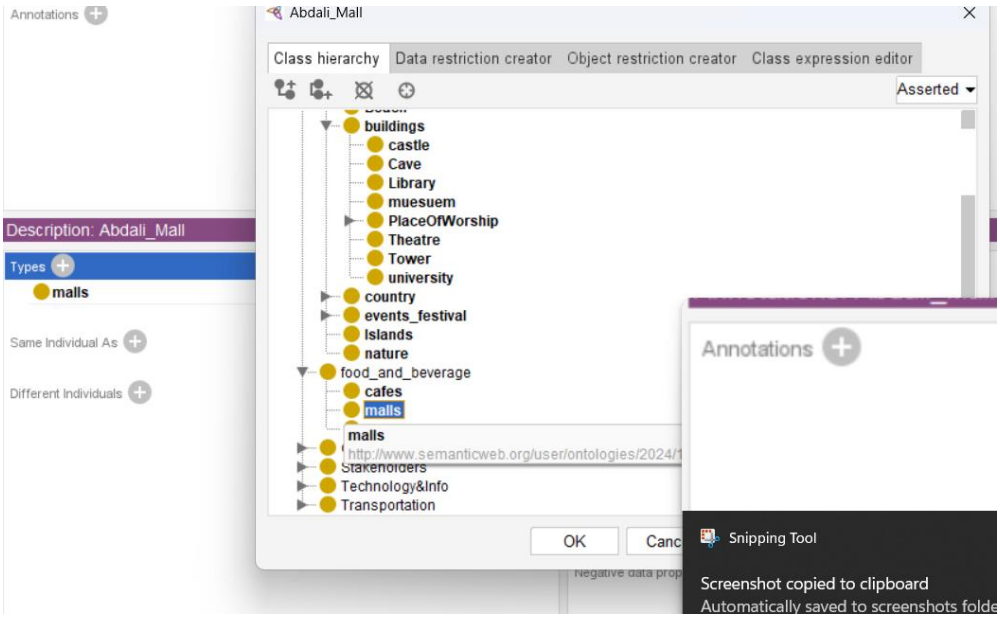
2- then a box will appears as below :

- you will write the individual’s name in the name field.



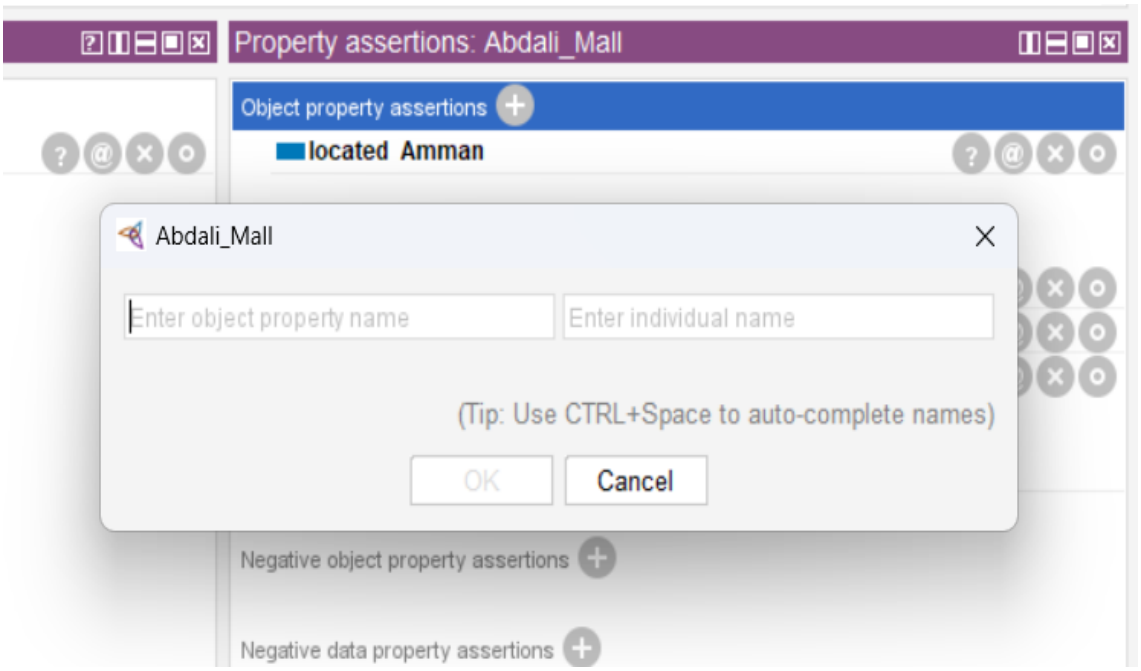
3- Then we determine the type of the individual .

- we click  and the box will appear as below :



4- Then we associate the individual with an object property as below :

- we click  and the box will appeare as below:



These are an examples of two concepts in sparql query :

1-

```
PREFIX dbo: <http://dbpedia.org/ontology/>

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>


SELECT ?country ?name ?capital ?population

WHERE {

 ?country a dbo:Country ;

       rdfs:label ?name ;

       dbo:capital ?capital ;

       dbo:populationTotal ?population .

 FILTER(lang(?name) = "en")

}

LIMIT 100
```

SPARQL | HTML5 table (faceted browsing links)

http://dbpedia.org/resource/Jordan	"Jordan"@en	http://dbpedia.org/resource/Amman	"11042719"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Jubaland	"Jubaland"@en	http://dbpedia.org/resource/Bu'ale	"1360633"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Jubaland	"Jubaland"@en	http://dbpedia.org/resource/Kismayo	"1360633"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Lithuania	"Lithuania"@en	http://dbpedia.org/resource/Vilnius	"2835988"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Peru	"Peru"@en	http://dbpedia.org/resource/Lima	"32275736"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Artsakh	"Republic of Artsakh"@en	http://dbpedia.org/resource/Stepanakert	"120000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Baja California	"Republic of Baja California"@en	http://dbpedia.org/resource/La Paz, Baja California Sur	"8000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Ireland	"Republic of Ireland"@en	http://dbpedia.org/resource/Dublin	"5123536"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Lucca	"Republic of Lucca"@en	http://dbpedia.org/resource/Lucca	"100000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Noli	"Republic of Noli"@en	http://dbpedia.org/resource/Noli	"1500"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Pisa	"Republic of Pisa"@en	http://dbpedia.org/resource/Pisa	"350000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Ragusa	"Republic of Ragusa"@en	http://dbpedia.org/resource/Dubrovnik	"90000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Sassari	"Republic of Sassari"@en	http://dbpedia.org/resource/Sassari	"15"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of Siena	"Republic of Siena"@en	http://dbpedia.org/resource/Siena	"50000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of the Congo	"Republic of the Congo"@en	http://dbpedia.org/resource/Brazzaville	"5546307"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Republic of the Rif	"Republic of the Rif"@en	http://dbpedia.org/resource/Ajdir	"7500000"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/Ukraine	"Ukraine"@en	http://dbpedia.org/resource/Kyiv	"41167336"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://dbpedia.org/resource/United Arab Emirates	"United Arab Emirates"@en	http://dbpedia.org/resource/Abu Dhabi	"9282410"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>

This query provided a list of countires like Jordan ,United Arab Emirates and their capitals like Amman

2-

```
PREFIX dbo: <http://dbpedia.org/ontology/>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
SELECT ?hotel ?name ?location
WHERE {
 ?hotel a dbo:Hotel ;
      rdfs:label ?name ;
      dbo:location ?location .
 ?location rdfs:label ?locationName .
 FILTER(lang(?name) = "en" && lang(?locationName) = "en")
 FILTER(CONTAINS(LCASE(?locationName), "arab"))
} LIMIT 100
```

SPARQL | HTML5 table

hotel	name	location
http://dbpedia.org/resource/Hyatt_Regency_Dubai	"Hyatt Regency Dubai"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Jumeirah_Beach_Hotel	"Jumeirah Beach Hotel"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Conrad_Dubai	"Conrad Dubai"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Ciel_Tower	"Ciel Tower"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Emirates_Palace	"Emirates Palace"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Ajman_Hotel	"Ajman Hotel"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Fairmont_The_Palm	"Fairmont The Palm"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Grand_Hyatt_Dubai	"Grand Hyatt Dubai"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Kempinski_Residences_Palm_Jumeirah	"Kempinski Residences Palm Jumeirah"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/W_Abu_Dhabi_-_Yas_Island	"W Abu Dhabi - Yas Island"@en	http://dbpedia.org/resource/United_Arab_Emirates
http://dbpedia.org/resource/Hatta_Fort_Hotel	"Hatta Fort Hotel"@en	http://dbpedia.org/resource/Hatta,_United_Arab_Emirates

This query provides a list of hotel entities related to the Arab region such as emirates palace hotel.

3-

PREFIX dbr: <http://dbpedia.org/resource/>

PREFIX dbo: <http://dbpedia.org/ontology/>

SELECT ?property ?value

WHERE {

dbr:Karak_Castle ?property ?value .

}

LIMIT 20

SPARQL | HTML5 table

property	value
http://www.w3.org/2000/01/rdf-schema#label	"Karak Castle"@en
http://dbpedia.org/ontology/wikiPageID	40974696
http://dbpedia.org/ontology/wikiPageRevisionID	756147074
http://dbpedia.org/ontology/wikiPageWikiLink	http://dbpedia.org/resource/Kerak_Castle
http://dbpedia.org/ontology/wikiPageRedirects	http://dbpedia.org/resource/Kerak_Castle
http://www.w3.org/ns/prov#wasDerivedFrom	http://en.wikipedia.org/wiki/Karak_Castle?oldid=756147074&ns=0
http://dbpedia.org/ontology/wikiPageLength	"26"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://xmlns.com/foaf/0.1/isPrimaryTopicOf	http://en.wikipedia.org/wiki/Karak_Castle

This query provides general information about Karak Castle, such as its history, architectural details

4-

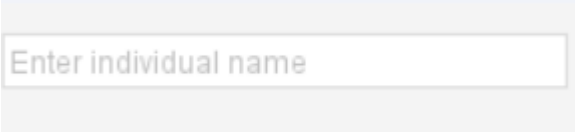
```
PREFIX dbr: <http://dbpedia.org/resource/>
PREFIX dbo: <http://dbpedia.org/ontology/>
SELECT ?property ?value
WHERE {
 dbr:Electronic_Cafe_International ?property ?value .
}LIMIT 20
```

SPARQL | HTML5 table

property	value
http://www.w3.org/2000/01/rdf-schema#label	"Electronic Cafe International"@en
http://dbpedia.org/ontology/wikiPageID	43877269
http://dbpedia.org/ontology/wikiPageRevisionID	626266274
http://dbpedia.org/ontology/wikiPageWikiLink	http://dbpedia.org/resource/Electronic_Café_International
http://dbpedia.org/ontology/wikiPageRedirects	http://dbpedia.org/resource/Electronic_Café_International
http://dbpedia.org/property/wikiPageUsesTemplate	http://dbpedia.org/resource/Template:R_from_title_without_diacritics
http://www.w3.org/ns/prov#wasDerivedFrom	http://en.wikipedia.org/wiki/Electronic_Cafe_International?oldid=626266274&ns=0
http://dbpedia.org/ontology/wikiPageLength	"79"^^<http://www.w3.org/2001/XMLSchema#nonNegativeInteger>
http://xmlns.com/foaf/0.1/isPrimaryTopicOf	http://en.wikipedia.org/wiki/Electronic_Cafe_International

This query provides general information about Electronic_Cafe_International, such as its location,services

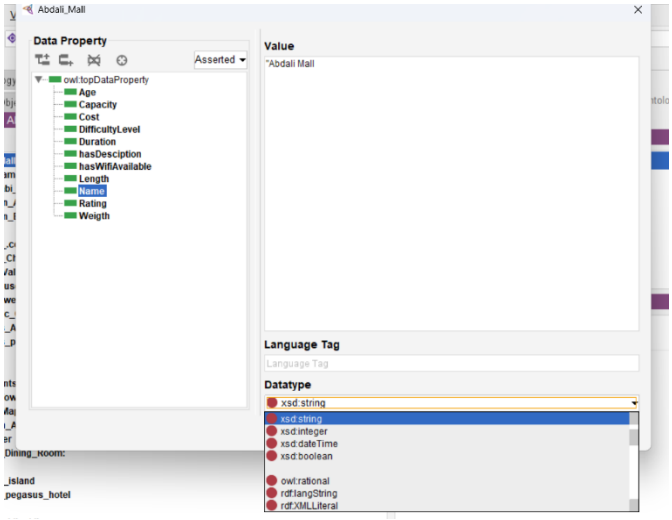
5 - choose the individual we want to link with the second individual :



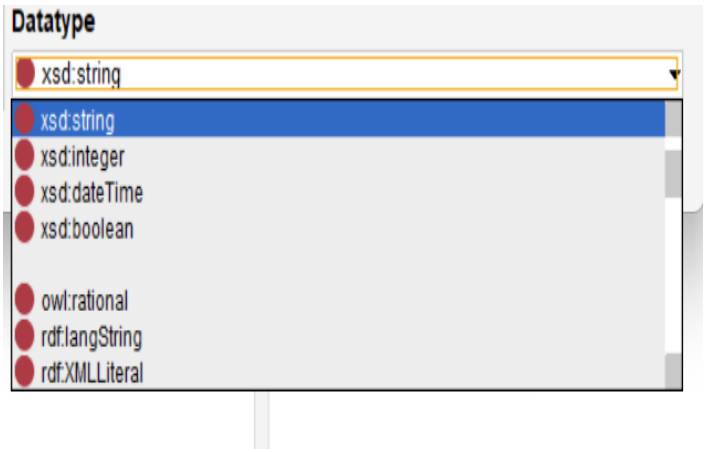
6- give the individual data propriety :

- click on data property assertions which appears in the picture on the left :

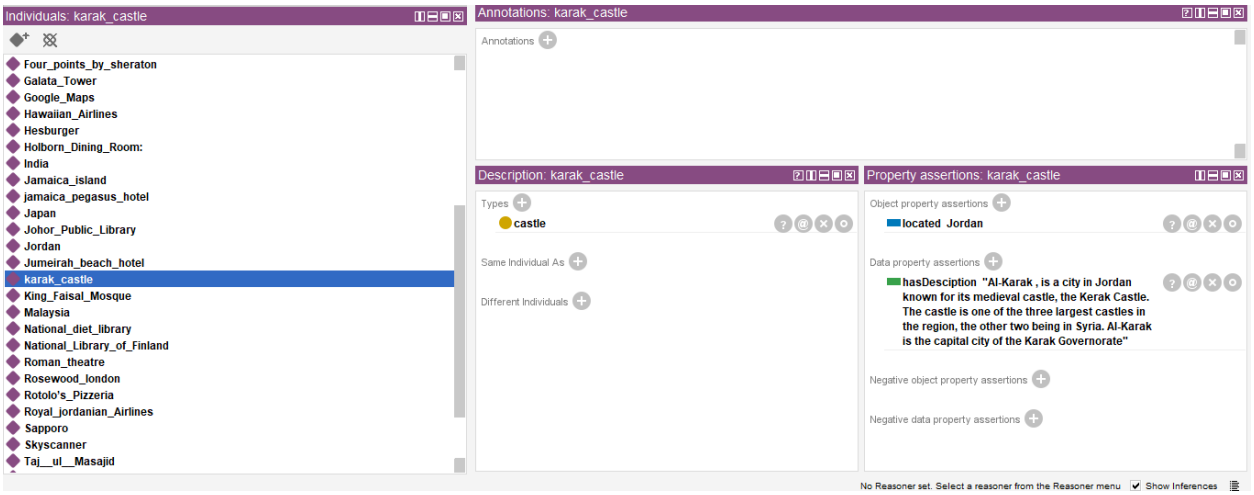
- the box on the right will appears:



- choose the datatype of the data property :



One of our instances “karak castle”:



One of our instances “Emirates Palace”: