CPIS382

Hotel Booking System

Presented by

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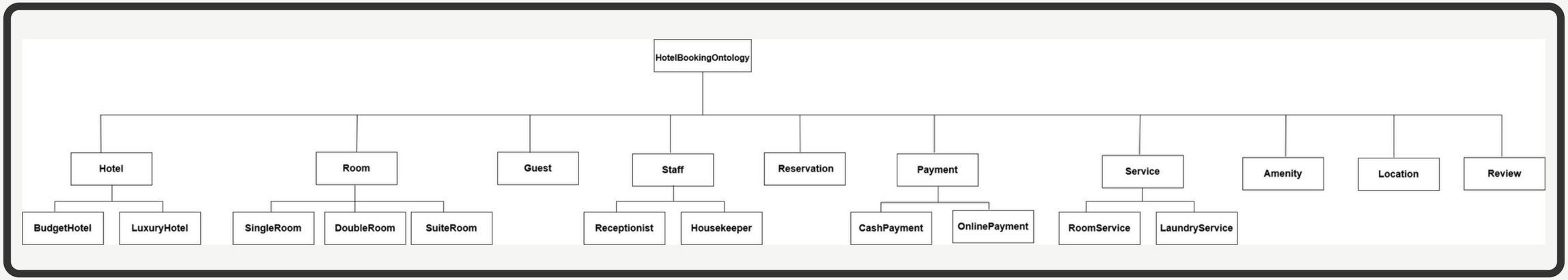
Introduction

This project develops a semantic ontology for a hotel reservation and management system using RDF and OWL. Traditional hotel systems store data in simple structures that cannot support intelligent reasoning or advanced queries. Our ontology organizes key hotel information such as rooms, guests, reservations, payments, services, and locations in a clear and machine-understandable format. With SPARQL, the system can answer smarter questions and provide a stronger foundation for future hotel management applications.

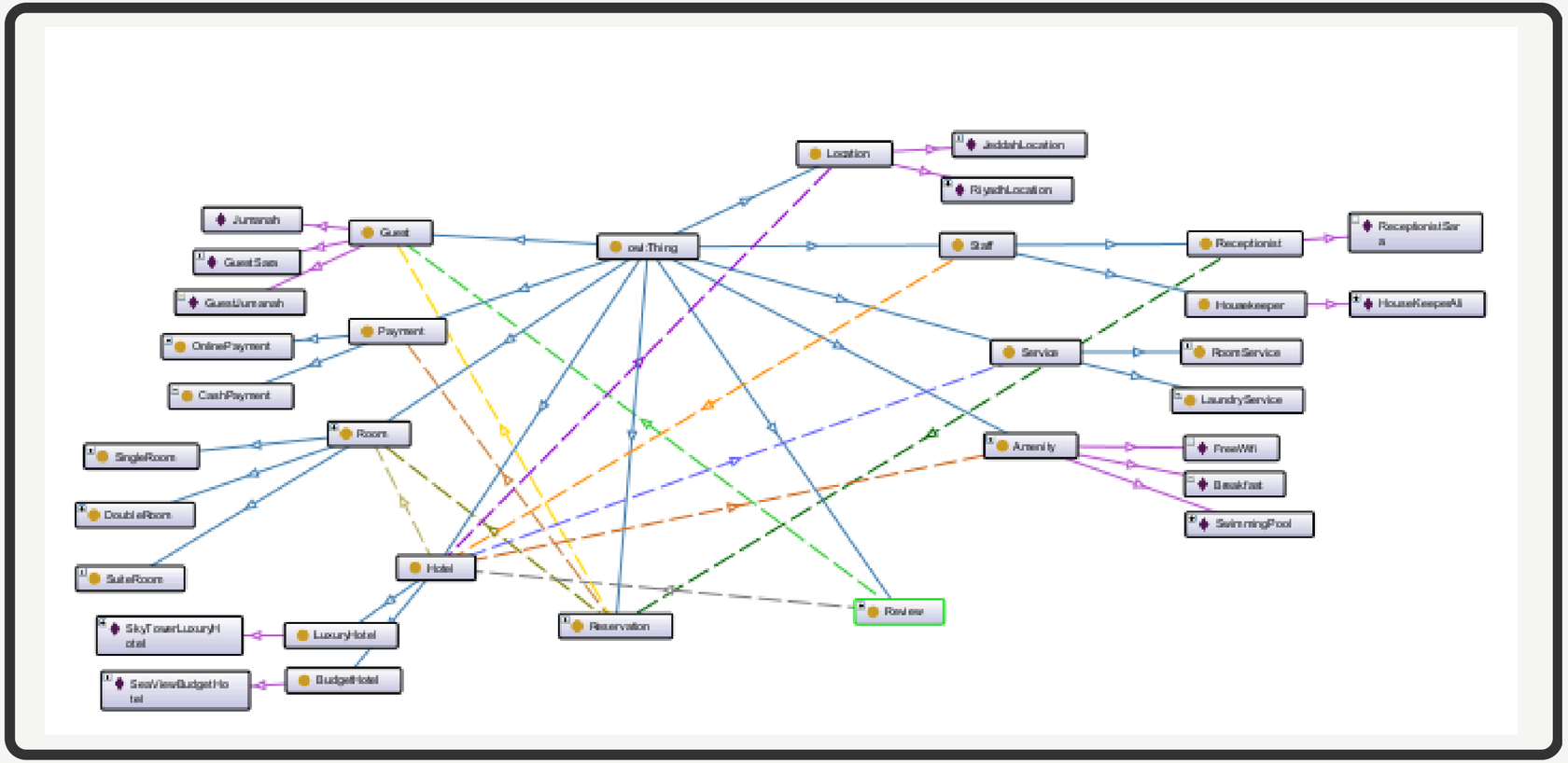
Application Design

Tree Diagram



Application Design

Tree Diagram



Description of classes and subclasses

	Description	Hierarchy Position
Hotel	Represents hotels in general	Class
LuxuryHotel	Represents high-end or luxury hotels.	Subclass of Hotel
BudgetHotel	Represents economical hotels	Subclass of Hotel
Room	Represents the types of rooms available in a hotel	Class
SingleRoom	Represents hotels in general	Subclass of Room

Description of classes and subclasses

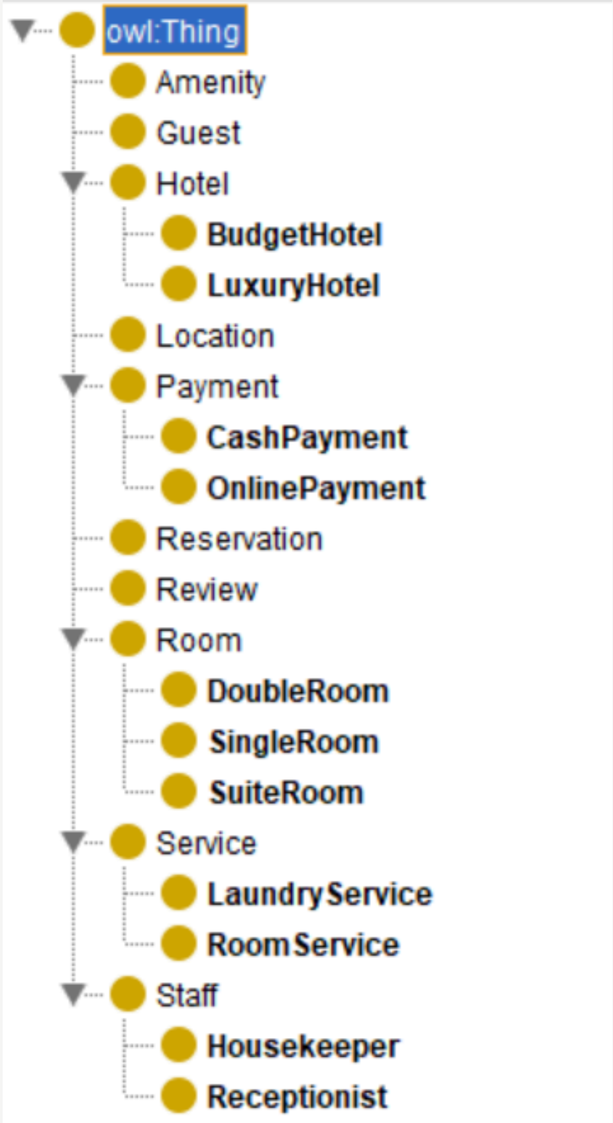
	Description	Hierarchy Position
DoubleRoom	Represents double occupancy rooms	Subclass of Room
SuiteRoom	Represents hotel suites	Subclass of Room
Payment	Represents methods of payment for services	Class
CashPayment	Represents payments made in cash	Subclass of Payment
OnlinePayment	Represents payments made online	Subclass of Payment

Description of classes and subclasses

	Description	Hierarchy Position
Staff	Represents employees who work at the hotel	Class
Receptionist	Represents front desk staff	Subclass of Staff
Housekeeper	Represents housekeeping staff	Subclass of Staff
Service	Represents the services offered by the hotel	Class
LaundryService	Represents laundry services	Subclass of Service

Description of classes and subclasses

	Description	Hierarchy Position
RoomService	Represents in-room dining or service	Subclass of Service
Guest	Represents the hotel guests or customers	Class
Amenity	Represents facilities extra features	Class
Reservation	Represents a booking transaction for a room	Class
Review	Represents ratings and reviews of the hotel or service.	Class
Location	Represents the geographical location of the hotel	Class


owl:Thing
Amenity
Guest
Hotel
BudgetHotel
LuxuryHotel
Location
Payment
CashPayment
OnlinePayment
Reservation
Review
Room
DoubleRoom
SingleRoom
SuiteRoom
Service
LaundryService
RoomService
Staff
Housekeeper
Receptionist

object properties

	Domain	Range	Description
bookedBy	Reservation	Guest	Links a reservation to the guest who made the booking
handlesReservation	Receptionist	Reservation	Associates a receptionist with the reservations they process.
hasAmenity	Hotel	Amenity	Connects a hotel to the amenities it offers like WiFi and breakfast
hasRoom	Hotel	Room	Links a hotel to the rooms it contains
locatedIn	Hotel	Location	Specifies the geographical location (city/region) where a hotel is situated
offersService	Hotel	Service	Associates a hotel with the services it provides such as room service and laundry

object properties

	Domain	Range	Description
paidBy	Reservation	Payment	Links a reservation to the payment transaction used
reservesRoom	Reservation	Room	Connects a reservation to the specific room that was booked
reviewsHotel	Review	Hotel	Links a review to the hotel being reviewed
worksAt	Staff	Hotel	Links a staff member to the hotel where they are employed
writtenBy	Review	Guest	Connects a review to the guest who wrote it

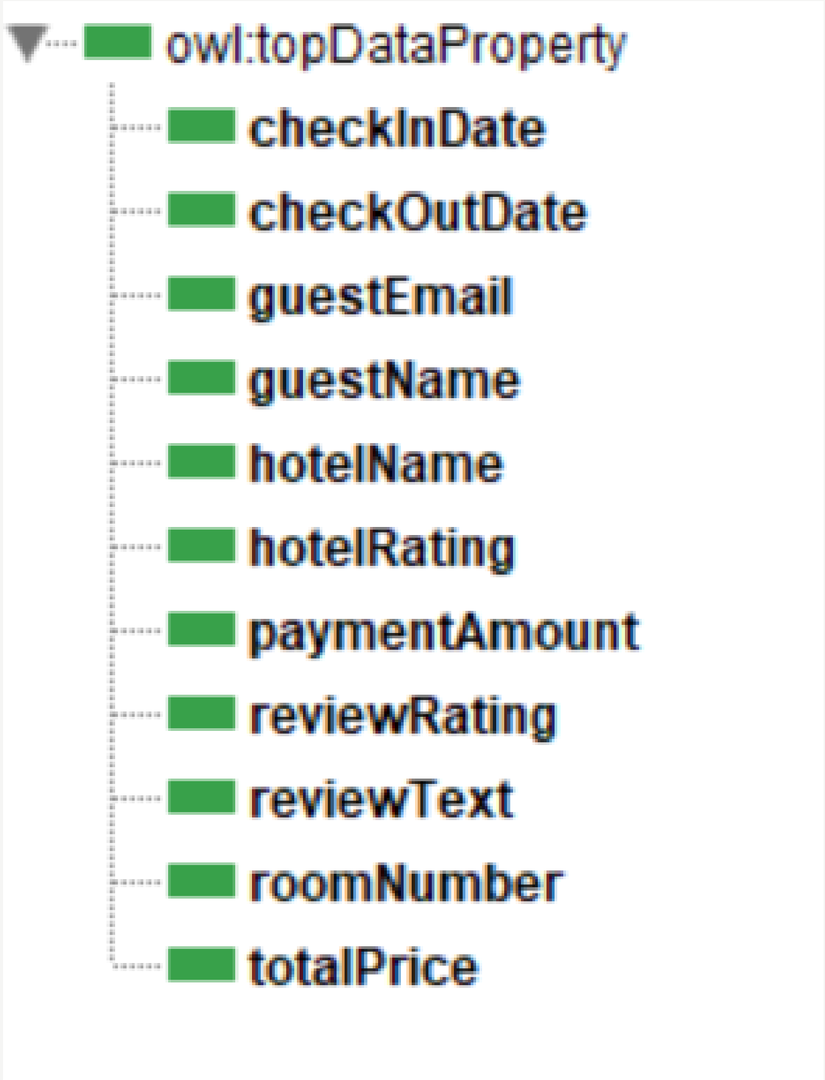

owl:topObjectProperty
bookedBy
handlesReservation
hasAmenity
hasRoom
locatedIn
offersService
paidBy
reservesRoom
reviewsHotel
worksAt
writtenBy

Data Properties

	Domain	Range	Description
checkInDate	Reservation	xsd:dateTime	Links a reservation to the guest who made the booking
checkOutDate	Receptionist	xsd:dateTime	Associates a receptionist with the reservations they process.
guestEmail	Guest	xsd:string	Connects a hotel to the amenities it offers like WiFi and breakfast
guestName	Guest	xsd:string	Links a hotel to the rooms it contains
hotelName	Hotel	xsd:string	Specifies the geographical location (city/region) where a hotel is situated
hotelRating	Hotel	xsd:decimal	Associates a hotel with the services it provides such as room service and laundry

Data Properties

	Domain	Range	Description
reviewText	Review	xsd:string	Links a reservation to the guest who made the booking
roomNumber	Room	xsd:string	Associates a receptionist with the reservations they process.
totalPrice	Reservation	xsd:decimal	Connects a hotel to the amenities it offers like WiFi and breakfast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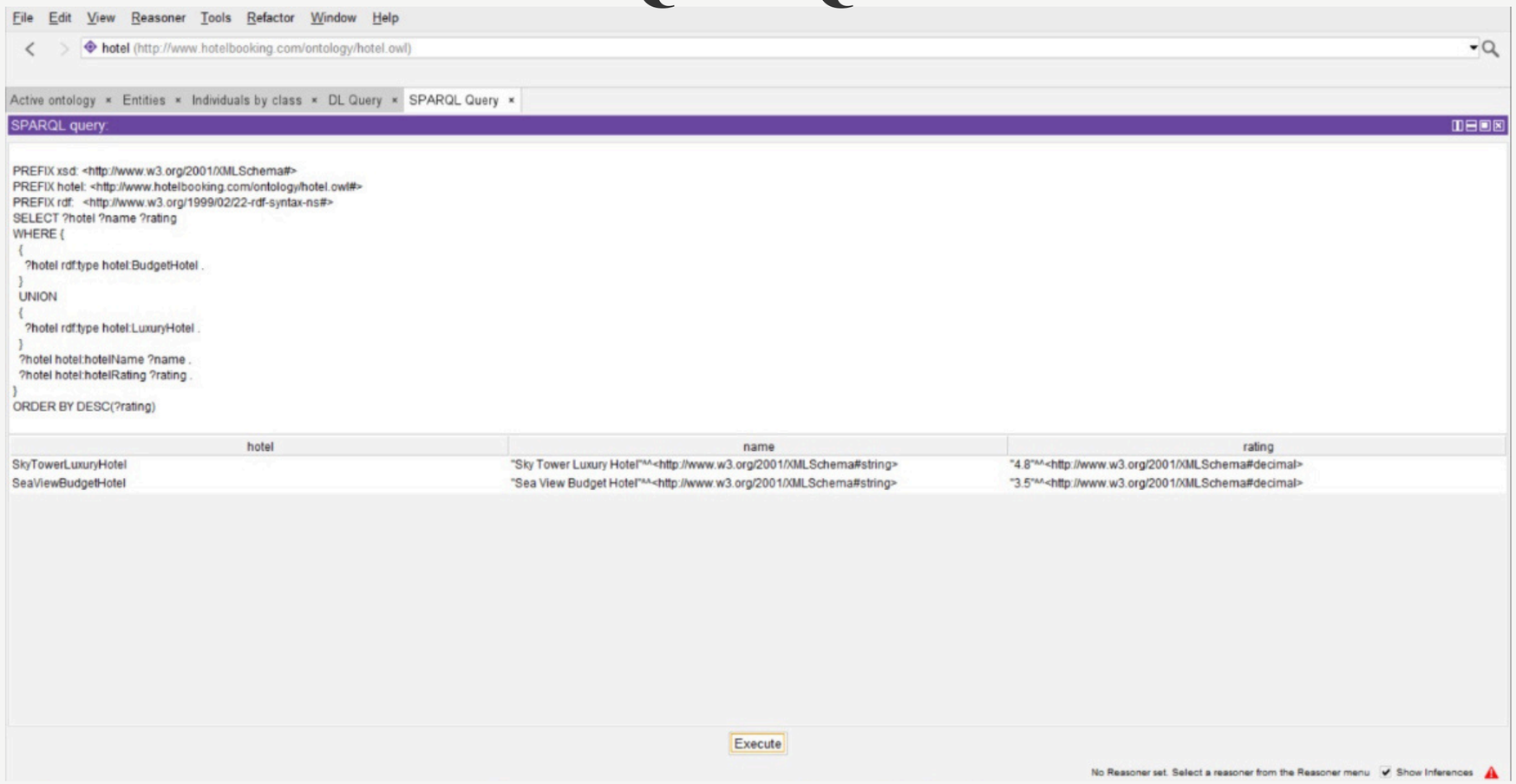
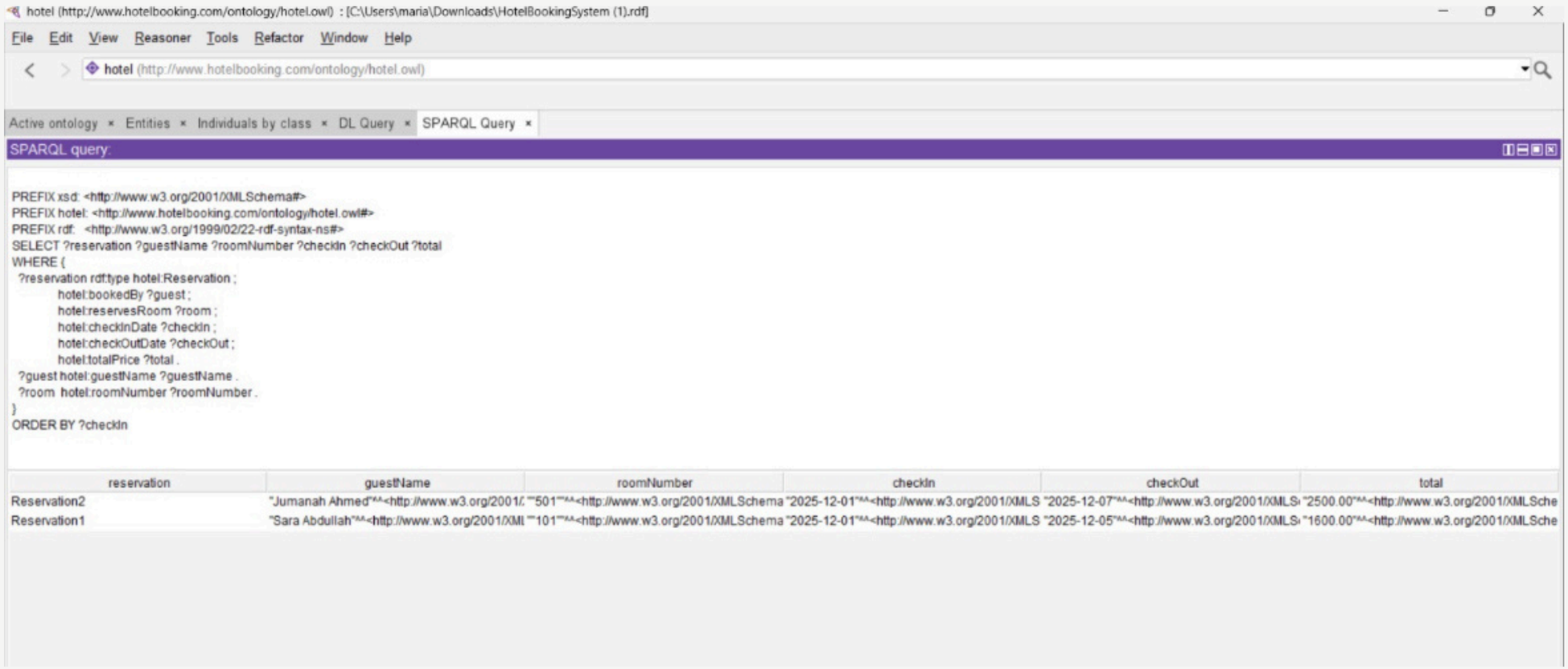
guestName
hotelName
hotelRating
paymentAmount
reviewRating
reviewText
roomNumber
totalPrice

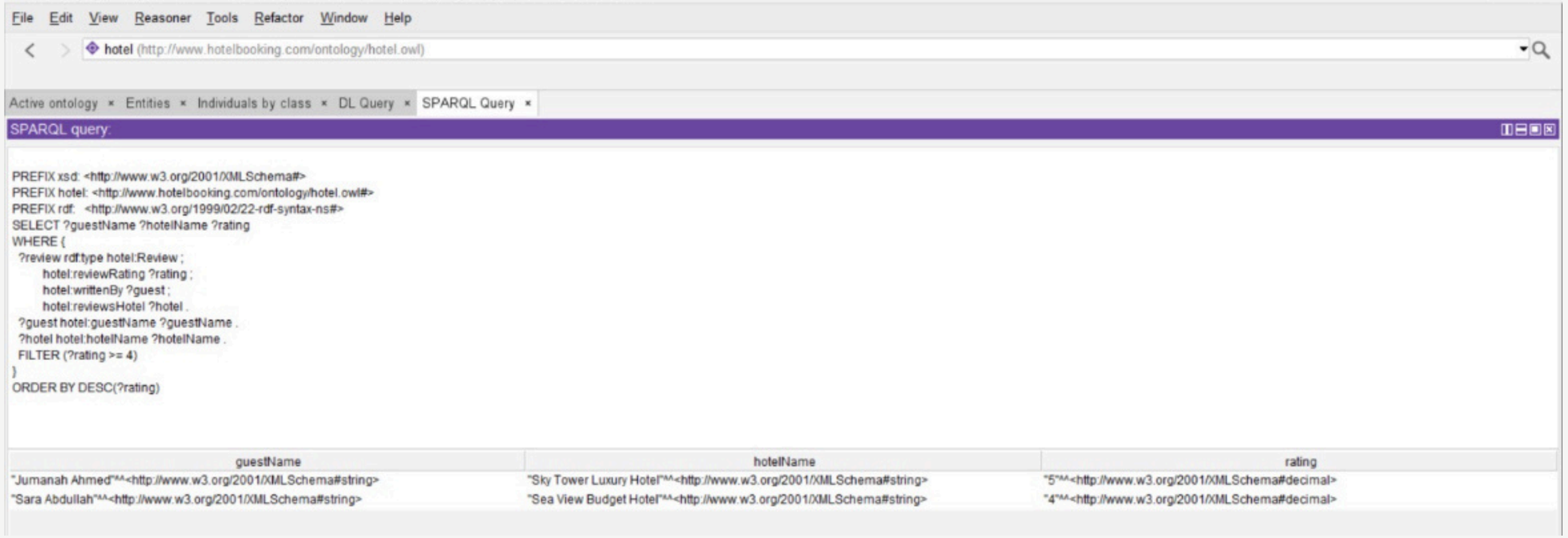
SPARQL Queries



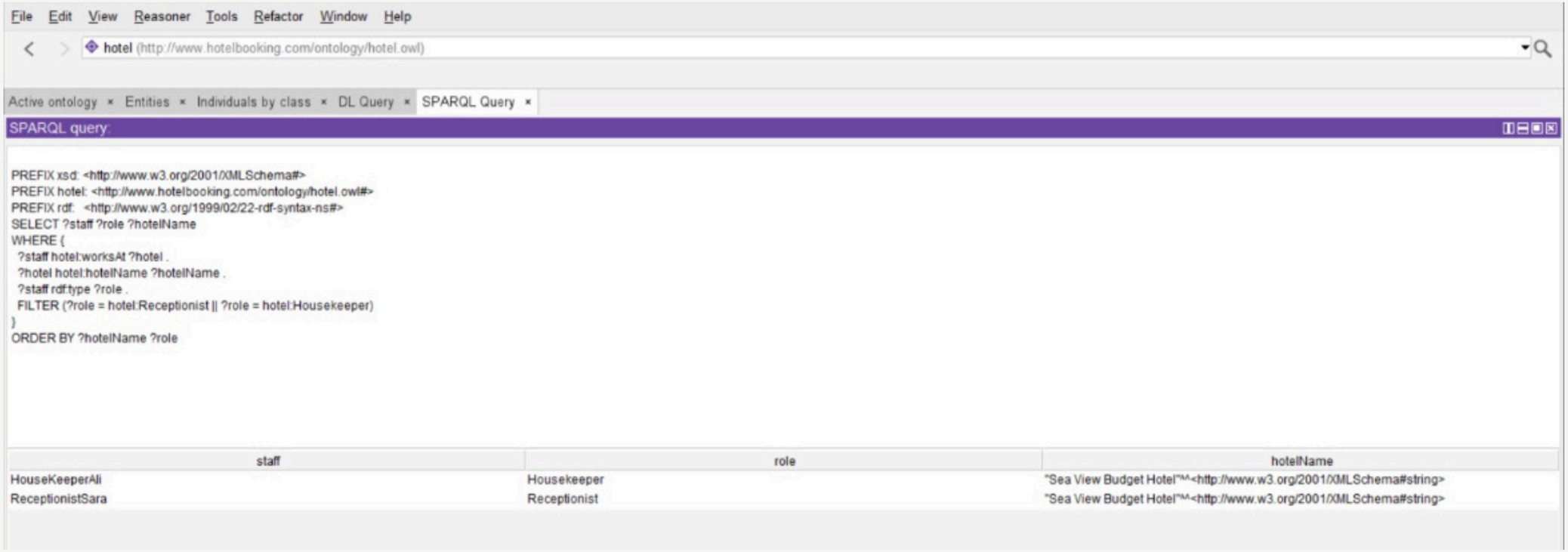
SPARQL Queries



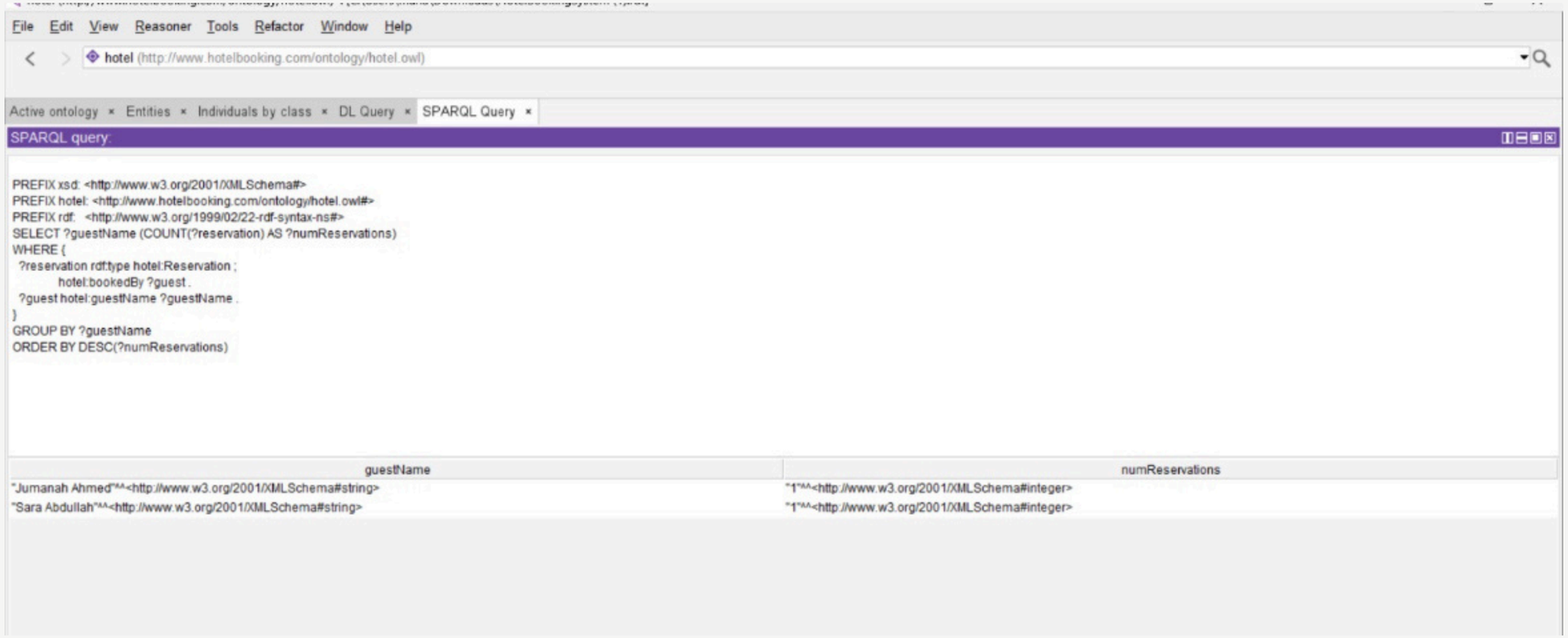
SPARQL Queries



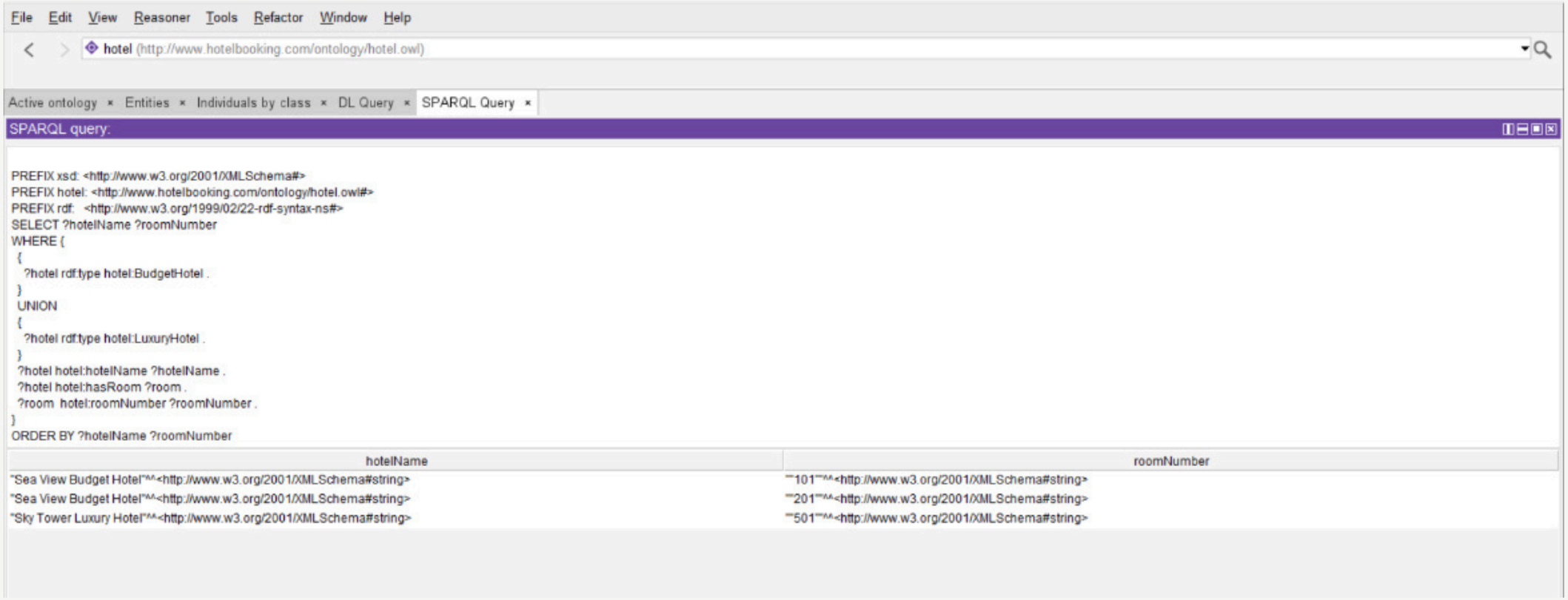
SPARQL Queries



SPARQL Queries



SPARQL Queries



Thank you

For your attention