Pizza

TOTAL CORRECT OUTPUTS = 22/37 =
59.46%

TRANSLATABLE: Cqs which should be transformed to a correct query
Correct outputs: 9/18 = 50%

CQ text	Output generated	Is it correct?	Can query be generated?	Comments

What are the types of vegetarian pizza?	SELECT DISTINCT * WHERE {
	?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#VegetarianPizza> .
	filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#VegetarianPizza> && ?x != owl:Nothing)
	}
		YES	YES	Correct query, asking for subclasses of vegetarian pizzas as expected.

What are the types of base options?	SELECT DISTINCT * WHERE {
	?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaBase> .
	filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaBase> && ?x != owl:Nothing)
	}
		YES	YES	Correct query, although “pizza options” was extracted as a phrase with ReqTagger, it was correctly matched to “Pizza Base” label

Which are real italian pizzas?	SELECT DISTINCT * WHERE {
	?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#RealItalianPizza> .
	filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#RealItalianPizza> && ?x != owl:Nothing)
	}
		YES	YES	Correct query, asking for subclasses of “Real Italian Pizza” as expected.

Are different bases avaialable?	Cannot generate a query from given CQ/ontology.	NO	YES	Failed to map “bases” to “Pizza Base” label
How many pizzas are available?		YES	YES	Although there is no template utilizing COUNT(*) aggegator, we think the method used the correct fallback chossing a template which simply lists all the pizza subclasses.

How many pizzas contain meat?	SELECT ?x WHERE {
	?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> ;
	rdfs:subClassOf [
	a owl:Restriction ;
	owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasTopping> ;
	owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#MeatTopping>] .
	}
		YES	YES	Correct query, chosen correct Pizza and Meat labels and mapped “contains” into “has Topping” based on examples in the ontology.

Which sort of cheese do we have?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#CheeseTopping> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#CheeseTopping> && ?x != owl:Nothing) }	YES	YES	Correct query
What sauces are available?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#SauceTopping> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#SauceTopping> && ?x != owl:Nothing) }	YES	YES	Correct query
What kind of pizza contains a single meat ingredient?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza>, [a owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasTopping> ; Owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#MeatTopping>] }	NO	YES	Although correct vocab is linked, there is no SPARQL-OWL template utilizing cardinality restrictions. We cannot classify it as a correct, since the question requires exactly “single” meat topping

Which are the nut free pizzas?	SELECT DISTINCT * WHERE {
	?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> .
	filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> && ?x != owl:Nothing)
	}
		NO	YES	Wrong query, a comlement to the class with Nut toppings should be generated but we have not SPARQL-OWL template able to do so.

Which pizzas do not have nuts?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> . ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#NutTopping>}	NO	YES	Wrong query, a comlement to the class with Nut toppings should be generated but we have not SPARQL-OWL template able to do so.

How many pizzas have either ham or chicken topping?	Cannot generate a query from given CQ/ontology.	NO	YES	There is no SPARQL-OWL template utilizing alternatives
Which pizzas contain prawns but not anchovy	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf [rdf:type owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasTopping> ; owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#AnchoviesTopping>] . ?x rdfs:subClassOf* <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> }	NO	YES	Cannot express of a complement to a class of anchovy, no required SPARQL-OWL template available
Which pizzas are spicy?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> . ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#SpicyTopping>}	CONDITIONAL YES	YES	Considering the knowledge modelled, there are classes with labels “Pizza” and “Spicy” which are correctly linked. Also, the query template seems to be reasonable: “Which are the objects being Pizza and being spicy at the same time”. But domain expertise lead to a conclusion that objectProperty hasTopping should be used here since pizza is not a topping. But, because the fact cannot be easily inferred, we conditionally classify this case as correct.
Are anchovies and capers used together?	ASK WHERE { <http://www.co-ode.org/ontologies/pizza/pizza.owl#AnchoviesTopping> rdfs:subClassOf [a owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#isIngredientOf> ; Owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#CaperTopping>] }	NO	YES	We don’t have a required SPARQL-OWL template which can be used here.
Which pizzas contain peppers and olives?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf [rdf:type owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasTopping> ; owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#OliveTopping>] . ?x rdfs:subClassOf* <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> }	NO	YES	We don’t have a required SPARQL-OWL template which can be used here.
What pizzas contain less than 3 toppings?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza>, [a owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasCountryOfOrigin> ; Owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaTopping>] }	NO	YES	We don’t have a required SPARQL-OWL template utilizing cardinality restrictions.
What kind of pizza bases are possible?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaBase> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaBase> && ?x != owl:Nothing) }	YES	YES	Correct query

UNTRANSLATABLE: Cqs which should generate empty result because they cannot be expressed using a query (mainly due to missing ontology vocab)
Correct outputs: 13/19 = 68.42%

Do pizzas come in different sizes?	Cannot generate a query from given CQ/ontology.	YES	NO	No notion of size in the ontology.
Can I remove toppings from a pizza?	ASK WHERE { <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaTopping> rdfs:subClassOf [a owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#isToppingOf> ; Owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza>] }	NO	NO	Nothing on topping removal, thus, query should not be generated.
Does this pizza contain halal meat?	ASK WHERE { <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> rdfs:subClassOf [a owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasTopping> ; Owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#MeatTopping>] }	NO	NO	No notion of halal meat, fallback to a general meat is nice, but we cannot accept that query.
Are we including the folded pizzas in our domain?	ASK WHERE { <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> rdfs:subClassOf [a owl:Restriction ; owl:onProperty <http://www.co-ode.org/ontologies/pizza/pizza.owl#hasCountryOfOrigin> ; owl:someValuesFrom <http://www.co-ode.org/ontologies/pizza/pizza.owl#DomainConcept>] }	NO	NO	Nothing on folded pizzas, for sure ‘hasCountryOfOrigin’ should not be used here :)

Is vegetarian pizza deep pan or Chicago style?	Cannot generate a query from given CQ/ontology.	YES	NO	No notion of chicago style
What are the origins of pizza toppings?	Cannot generate a query from given CQ/ontology.	YES	NO	Nothing on origins of toppings modelled
Is spicy pizza stuffed crust and what is it stuffed with?	Cannot generate a query from given CQ/ontology.	YES	NO	Nothing on stuffing process in the ontology.
How much it will cost me to order all pizzas in the menu?	Cannot generate a query from given CQ/ontology.	YES	NO	Nothing on costs in the ontology.
Which toppings are allowed for customization pu	Cannot generate a query from given CQ/ontology.	YES	NO	Nothing on customization in the ontology
Are toppings organic?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaTopping> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#PizzaTopping> && ?x != owl:Nothing) }	NO	NO	Nothing on organic kind of toppings in the ontology
Can I have a menu without pizzas please?	Cannot generate a query from given CQ/ontology.			
Which are the offers of the day?	Cannot generate a query from given CQ/ontology.	YES	NO	Nothing on the offers of the day in the ontology
Which is the latest combination of toppings?	Cannot generate a query from given CQ/ontology.	YES	NO	The ontology does not model the temporal dimension
Are there any children pizzas?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> && ?x != owl:Nothing) }	YES	NO	Nothing on children pizzas in the ontology
Is spicy pizza thin or thick bread?	Cannot generate a query from given CQ/ontology.			
Which pizzas are sharing 3 or more ingredients?	Cannot generate a query from given CQ/ontology.	YES	NO	We think a SPARQL-OWL query cannot be stated here
Processing Can you have a pizza with any combination of toppings?	Cannot generate a query from given CQ/ontology.	YES	NO	We think a SPARQL-OWL query cannot be stated here
How much does Margherita Pizza weight?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Margherita> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#Margherita> && ?x != owl:Nothing) }	NO	NO	Nothing on weight in the ontology.
Processing Is pizza healthy?	SELECT DISTINCT * WHERE { ?x rdfs:subClassOf <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> . Filter(?x != <http://www.co-ode.org/ontologies/pizza/pizza.owl#Pizza> && ?x != owl:Nothing) }	NO	NO	Nothing on health in the ontology. But I see what SeeQuery did there, it is not that important if pizzas are healthy, pizzas are tasty – thus, let's ignore the health questions and just list the options!