Domain Relational Calculus

1. Find the names of pizzas that come in a 10 inch size

{<N> | ∃C ∃S
(pizza(C, N, S)∧ S = 10)}

2. Find the names of pizzas that come in a 10 inch or a 12 inch size

{<N> | ∃C ∃S
(pizza(C, N, S) ∧ (S = 10 ∨ S = 12))}

3. Find the names of pizzas that come in both a 10 inch and a 12 inch size

{<N1> | ∃C1 ∃S1 ∃C2 ∃N2 ∃S2
(pizza(C1, N1, S1) ∧ pizza(C2, N2, S2) ∧ N1 = N2 ∧ S1 = 10 ∧ S2 = 12)}

4. Find the pairs of different codes of pizzas with the same name and the same size (is there any?)

{<C1, C2> | ∃N1 ∃S1 ∃N2 ∃S2
(pizza(C1, N1, S1) ∧ pizza(N2, C2, S2) ∧ C1 <> C2 ∧ N1 = N2 ∧ S1 = S2)}

5. Find the names and phone numbers of the stores in "College Park" or "Greenbelt" that sell a 10 inch pizza named "pepperoni" for less than $8

{<SN, P> | ∃C ∃N ∃S ∃A ∃Pr
(pizza(C,N, S) ∧ store(SN, A, P) ∧ sells(SN, C, Pr) ∧ (A = « College Park » ∨ A = « Greenbelt ») ∧ N = "pepperoni" ∧ S = 10 ∧ Pr<8)}

6. Find the codes of the most expensive pizzas – assume the scheme of the database is reduced to a relation pizza(<u>code</u>, price) to simplify –

{<C1> | ∃N1 ∃S1 ∀C2 ∀N2 ∀S2
(pizza(C1, N1, S1) ∧ (pizza(C2, N2, S2) ⇒ P1 ≥ P2))}

7. Find the names of the stores that sell all the pizzas

{<SN> | ∃A ∃P ∀C ∀N ∀S ∃Pr
(store(SN, A, P) ∧ (pizza(C,N, S) ⇒ sells(SN, C, Pr)))}